SOCIAL ISOLATION, PSYCHOLOGICAL HEALTH, AND PROTECTIVE FACTORS IN ADOLESCENCE

Jennifer A. Hall-Lande, Marla E. Eisenberg, Sandra L. Christenson, and Dianne Neumark-Sztainer

ABSTRACT

This study investigates the relationships among social isolation, psychological health, and protective factors in adolescents. Feelings of social isolation may influence psychological health in adolescents, but protective factors such as family connectedness, school connectedness, and academic achievement may also play a key role. The sample included 4,746 adolescents from 31 middle and high schools. Participants responded to 221 survey questions regarding peer relationships, psychological health, school connectedness, family relationships, and academic achievement. The findings revealed that social isolation was associated with an increased risk for depressive symptoms, suicide attempts, and low self-esteem. Protective factors influenced associations between social isolation and psychological health. Implications for prevention such as building healthy peer relationships, promoting family connectedness, and developing school-based interventions are discussed.

INTRODUCTION

Adolescence is a unique developmental period. It is a time characterized by a strong desire for independence combined with an increased need for social support from peers. One of the strongest indicators of psychological health in adolescents is a sense of meaningful connection with peers (Boivin, Hymel, & Bukowski, 1995; Rubin & Mills, 1988; Rubin & Stewart, 1996; Qualter & Munn, 2002). Thus, adolescence may be a time of particular psychological vulnerability to the risks associated with feelings of social isolation from peers.

Although feelings of social isolation may contribute to the occurrence of poor psychological health during adolescence, a question remains

This study was supported by Grant MCJ-270834 (D. Neumark-Sztainer, principal investigator) from the Maternal and Child Health Bureau (Title V, Social Security Act), Health Resources and Service Administration, U.S. Department of Health and Human Services.

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ADOLESCENCE, Vol. 42, No. 166, Summer 2007
Libra Publishers, Inc., 3089C Clairemont Dr., PMB 383, San Diego, CA 92117
about the influence of protective factors on this relationship. A review of the literature on adolescent health presents an interesting research question: Can the protective elements of strong connections to school and family compensate for the absence of close and meaningful peer relationships during the adolescent years? Considering the potential negative outcomes of social isolation in adolescence, it follows that these protective factors may also buffer the potential negative psychological effects associated with feelings of social isolation in adolescence. Yet, the relationship between social isolation, psychological health risks, and related protective factors in adolescence is poorly understood.

Using a sample of 4,746 adolescents in grades 7-12 from a large, Midwestern metropolitan area, this study explores the associations between social isolation and psychological health such as depressive symptoms, self-esteem, and suicidal behavior. The influence of protective factors including family connectedness, school connectedness, and academic achievement is also examined.

LITERATURE REVIEW

Benefits of Adolescent Peer Relationships

A myriad of psychological benefits exist for adolescents who report close connections to peers. Children and adolescents with close and supportive friendships report higher levels of peer acceptance, increased social competence, higher levels of motivation and active school involvement, and lower levels of behavioral problems as well as increased levels of self-worth, social competence, leadership skills, and improved school performance (Hansen, Giacoletti, & Nangle, 1995; Savin-Williams & Berndt, 1990). Further, the quality of peer relationships in childhood and adolescence may be one of the most important indicators of future psychological health (Boivin et al., 1995, Parker & Asher, 1993; Rubin, Bukowski, & Parker, 1998).

As adolescents navigate their social world, close peer relationships offer many protective benefits. Adolescents formulate group alliances to provide psychological support and a sense of belonging. An increased need emerges for social support and emotional connections with the peer group. They desire confidants with whom to talk about their peers, personal lives, and challenges. The deeper qualities of friendship such as similarities in personality and emotional intimacy become essential components of adolescent relationships (Claes, 1992; Pollack & Shuster, 2000).

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Peer relationships serve as a major influence in the development and validation of a sense of self-efficacy and self-esteem (Bandura, 1982). The quality and closeness of peer relationships often become integrated into the adolescent’s self-concept and personal identity (Rubin & Mills, 1988). Close relationships with peers are consistently associated with emotional well-being in adolescence. Therefore, adolescence may be a time of particular vulnerability to the psychological health risks associated with feelings of social isolation (Rubin, LeMare, & Lollis, 1990).

Adolescence and Psychological Health Risks

Social isolation during adolescence is often a very painful emotional experience. Adolescents who do not report having close friendships consistently have lower levels of self-esteem and more psychological symptoms of maladjustment (Berndt, Hawkins, & Jiao, 1999; Stocker, 1994). In particular, adolescent perceptions of the quality and closeness of their peer relationships are consistently associated with issues of self-esteem, perceptions of social competence, and internalizing problems such as depression (Rubin & Mills, 1998; Weinberg, 2001). Previous literature suggests a relationship between social isolation in adolescence and depression (Rubin & Mills, 1998). Higher levels of loneliness have been consistently associated with significantly lower levels of self-worth in adolescents (Qualter & Munn, 2002).

Suicidal ideation and suicide attempts are other major risk factors during adolescence. Previous research reveals that suicidal behavior is associated with low levels of close friendship support (Prinstein, Boergers, Spirito, Little, & Grapentine, 2000). Adolescents reporting strong social support demonstrate increased levels of resilience and decreased levels of suicide risk. Perceptions of positive relationships with family and friends are associated with lower levels of suicidal ideation and suicide attempts (Harter, Marold, Whitesell, & Cobbs, 1996). Adolescents who report feeling supported by school staff, family, or peers display more effective coping mechanisms and communicate a more positive attitude about their future (DeWilde, Kienhorst, Dieksstra, & Wolters, 1993). In contrast, adolescents who report lack of social support and feelings of isolation may behave in self-harming ways such as suicidal ideation and suicide attempts (Spruijt & de Goode, 1997).

Gender Differences in Psychological Health

In terms of gender, adolescent girls are more likely to have internalized symptoms of depression, and boys are more likely to engage in externalizing types of behavior (Ostrov, Offer, & Howard, 1989). Before
adolescence, symptoms of depression appear to be equally common in girls and boys. After the age of 15, girls report depressive symptoms and depression at a rate twice as high as boys (Weissman & Klerman, 1977; Rutter, 1996). Previous research reveals that adolescent girls report greater frequency of depressive symptoms, lower levels of self-esteem, and increased suicidal ideation and suicide attempts compared to boys (Chartier & Lassen, 1994; Pope, Smith, Wayne, & Kelleher, 1994; Windle, Miller-Tutzauer, & Domenico, 1992; Zhang & Jin, 1996).

Protective Factors

Protective factors promote positive, healthy psychological outcomes and decrease risk behavior (Garmezy, 1985, 1991; Masten & Garmezy, 1985; Rutter, 1990; Tiet et al., 1998). Protective factors can range from internal types such as motivation, personality, and intelligence to external such as family closeness, quality friendships, and community support (Masten & Garmezy, 1985; Werner, 1986, 1989). The increased vulnerability for psychological problems during the adolescent developmental period has created an interest in identifying potential protective factors that promote health and diminish the risk of poor psychological outcomes (Resnick, Harris, & Blum, 1993; Resnick et al., 1997). Among the factors that influence adolescent health, the most prominent are families, schools, and peers (Hawkins & Weiss, 1985).

Adolescent Protective Factors

Family connectedness. Family connectedness refers to a sense of closeness and caring from family members. It is one of the most important contributors to positive outcomes and psychological health of adolescents (Blum & Reinhardt, 1997; Doll & Lyon, 1998; Field, Diego, & Sanders, 2001; Resnick et al., 1993). Adolescents from families with high levels of family connectedness report later initiation of sexual activity, decreased pregnancy rates, lower levels of substance abuse, and fewer suicide attempts than those with lower levels of family connectedness (DeVore & Ginsburg, 2005; Resnick et al., 1997).

Longitudinal studies of children and adolescents who have experienced severe adversity also indicate the importance of caregiver relationships for successful adaptation and psychological health. The protective elements of family connectedness appear to derive from the connection to at least one nurturing adult (Resnick et al., 1993; Masten & Coatworth, 1998). Regardless of other risk factors, strong connections with family appear to provide children with the resources that promote healthy psychological development (Pianta & Walsh, 1998). Thus, it follows that family connectedness may mediate the negative influences of social isolation in adolescence.
**Academic achievement.** Another prominent social context for adolescent development is the school setting. Schools are a forum in which adolescents have the opportunity to achieve both academically and socially. Although academic achievement is frequently defined by test scores and grades, it is also a prominent indicator of an adolescent's ability to adapt to expectations of the school environment (Masten & Coatworth, 1998). Low grade point average and grade retention are associated with a variety of risk factors including higher levels of emotional distress, substance use, involvement in violence, and earlier onset of sexual intercourse (Resnick et al., 1997) as well as increased risk of dropout (Christenson, Sinclair, Lehr, & Hurley, 2000; Jimerson, Egeland, Sroufe, & Carlson, 2000). Educational goals and active engagement in academics have been associated with resilience (Masten, Hubbard, Gest, Tellegen, Garmezy, & Ramirez, 1999) and positive outcomes such as school completion (Sinclair, Christenson, & Thurlow, 2005). As a result, academic achievement may represent a potential protective factor for socially isolated adolescents.

**School connectedness.** Connection to school is another potential protective factor. It can be defined as the experience of caring about school and a feeling of connection to the school environment and school staff (Eccles, Early, Frasier, Belansky, & McCarthy, 1997). Although academic achievement may be associated with school connectedness, measures of school connectedness more specifically address student feelings and attitudes about going to school (Jessor, Van Den Bos, Vanderynn, Costa, Turbin, 1995).

Previous research supports the view that students with higher levels of school connectedness report significantly lower levels of psychological problems, suicidal thoughts, suicide attempts, violent behavior, substance use, sexual behaviors (Resnick et al., 1997; Steinberg, 1996) and peer harassment (Eisenberg, Neumark-Stzainer, & Perry, 2003). Strong connections to school exert a powerful influence in the lives of students. For some, relationships with educators are among the most meaningful in their lives (Anderson, Christenson, Sinclair, & Lehr, 2004; Garbarino, 1999; Hawkins, Catalano, & Kosterman, 1999; Pi- anta & Walsh, 1998). Strong connections to school are associated with safer behaviors, improved health outcomes for adolescents, better academic performance, and more extracurricular involvement (Bonny, Britto, Klostermann, Hornung, & Slap, 2000; Resnick et al., 1997). Relationships between students and teachers have been positively associated with students' motivation, achievement, feelings of belonging, and effect in school (Roeser, Eccles, & Sameeroff, 1998, 2000).
Protective Factors and Gender

The study of protective factors in adolescence also reveals some potential gender differences, which have been documented in terms of the significance of protective factors (Resnick, 2000) and in terms of coping responses (Copeland & Hess, 1995). Girls depend on others such as peers and family members for emotional support more often than do males (Youniss & Smollar, 1985; van Beest & Baerveldt, 1999).

CONCLUSION

Adolescence presents many psychological difficulties; however, it is also a time in which individuals draw increased strength and support from the peer group. Because of the developmental importance of peer relationships during adolescence, psychological risks may be significantly more pronounced for adolescents who do not experience the protective benefits of close and meaningful social relationships with peers. Although social isolation may increase vulnerability to negative psychosocial outcomes, little is known about the relationship between social isolation, psychological health, and protective factors in adolescence. The inclusion of protective factors in addition to risk factors presents a more comprehensive view of the different variables that influence the lives of adolescents (Rew & Horner, 2003). Further, the examination of the relationship between social isolation, psychological health, and protective factors may help elucidate areas of vulnerability as well as opportunities for intervention.

The purpose of this study, therefore, was to explore the associations between feelings of social isolation in adolescence and specific psychological health risks including depressive symptoms, low self-esteem, suicidal ideation, and suicide attempts. The mediating influence of protective factors (family connectedness, school connectedness, academic achievement) on this relationship were also examined. Two primary hypotheses guided this study. First, feelings of social isolation during adolescence predispose individuals to psychological health risks including depressive symptoms, poor self-esteem, and suicidal behavior. Second, protective factors such as family connectedness, academic achievement, and school connectedness will influence or buffer the association between social isolation and psychological health risks.
Participants

The student sample used in this study consisted of 4,746 adolescents in grades 7-12 from 31 public middle schools and high schools in a large, Midwestern metropolitan area. The school districts included schools in both suburban and urban areas. The urban areas selected consisted of socioeconomically and ethnically diverse communities. The participant sample was roughly equivalent in terms of gender (50.2% boys, 49.8% girls). The sample consisted of 65.7% high school students and 34.3% middle school students with a mean age of 14.9 years (age range = 11 to 18 years). The racial/ethnic backgrounds were as follows: 48.5% white, 19.2% Asian American, 19.0% African American, 5.8% Hispanic, 3.5% Native American, and 3.9% mixed/other race. The majority of the Asian population was from Southeast Asia; approximately two-thirds of this group was Hmong. Socioeconomic status was divided as follows: 17.4% of the sample was of low socioeconomic status, 19.1% of lower middle class, 26.6% was middle class, 23.4% was upper middle class, and 13.8% of high socioeconomic status.

Data Collection

Data for the study were drawn from Project EAT (Eating Among Teens). The Project EAT survey is a 221-item instrument designed by the research team to investigate eating patterns and related health and social behavior among adolescents. The questions in the survey were based on existing adolescent health surveys, with additional questions developed by the research team. The survey went through several revisions based on input from experts in the field of adolescent health, an adolescent advisory board, focus groups, and pre-test feedback from 252 7th- and 10th-grade students.

Data were gathered during the 1998-1999 school year. Trained research staff administered Project EAT surveys in health, physical education, and science classrooms in one 90-minute period or two 50-minute periods. The university's Human Subjects Committee and the research boards of the participating school districts approved the study procedures. Consent procedures were aligned with individual school district policy of each participating school. Response rate was 81.5%. Reasons for nonparticipation included student absence on the day of survey administration and failure to return consent forms. Additional details on Project EAT are available elsewhere (Neumark-Sztainer, Story, Hannan, Perry, Irving, 2002; Neumark-Sztainer, Story, Hannan, & Moe, 2002).
Measures

Social isolation was measured with a single survey item, "Do you have one or more close friends you can talk to about your problems?" Response categories were "Yes, always"; "Yes, sometimes"; "No." In order to identify the most clearly isolated subset of students, a dichotomous variable was created by combining the two "yes" responses into a single "yes" response. Adolescents who responded "no" were categorized as socially isolated with regard to peers.

Dependent variables included self-esteem, depressive symptoms, suicidal ideation, and suicide attempts. The scale for self-esteem used 6 items adapted from the Rosenberg self-esteem questionnaire (Rosenberg, 1965) and assessed level of agreement with statements such as "I certainly feel useless at times" and "On the whole I am satisfied with myself." Scores ranged from 6 to 24 with higher scores indicating higher levels of self-esteem. Depressive mood was assessed using a six-item scale (Kandel & Davies, 1982). Each item asked participants the extent to which, in the last 12 months, they had been troubled or bothered by symptoms of depression, for example, "During the past 12 months, how often have you been bothered or troubled by feeling too tired to do things?" Scores ranged from 6 to 18 with a score of 6 indicating the fewest symptoms of depression. Suicidal ideation and suicide attempts were each measured with a single item: "Have you ever thought about killing yourself?" and "Have you ever tried to kill yourself?" respectively. Both items had response options: "Yes, during the past year," "Yes, more than a year ago," "No." For each item, both yes responses were grouped together and compared to those with no suicidal thoughts or attempts.

Protective factors included school connectedness, academic achievement, and family connectedness. School connectedness was assessed with the question, "How do you feel about going to school?" with responses on a five-point scale ranging from "I don't like school at all" to "I like school all of the time." Academic achievement was assessed by student self-report of the two grades they received most often ("A-F"). Grade point average (ranging 0-4) was calculated based on these two grades. Family connectedness was assessed with a 4-item scale. Two separate questions asked, "How much do you feel your (mother, father) cares about you?" and "Do you feel that you can talk to your (mother, father) about your problems?" Five response categories for both questions were "not at all," "a little," "somewhat," "quite a bit," "very much." Scores for the items were averaged to create a connectedness score ranging from 1 to 5, with higher scores indicating greater connectedness to family.
Status variables included gender, race, body mass index (BMI), socioeconomic status (SES), and grade level (middle vs. high school). Gender, school level, race, ethnicity, and parent educational level were collected by student self-report. Twelve students missing data on gender were excluded from analysis. School level was divided into middle school (7th and 8th grade) and high school (9th through 12th grade). Race/ethnicity was assessed with the following questions: “Do you think of yourself as (a) white, (b) Black and African American, (c) Hispanic or Latino, (d) Asian American, (e) Hawaiian or Pacific Islander, or (f) Native American or American Indian.” Students could choose multiple responses for this item. Respondents were grouped as white and nonwhite (dichotomized) for multi-variate analysis, due to small numbers in some race groups. Five levels of socioeconomic status (SES) were based primarily on the highest level of education completed by either parent. When this information was missing, eligibility for public assistance, eligibility for free and reduced priced lunches, and parental employment status were used to infer SES (Breiman, Friedman, Olshen, & Stone, 1984; Neumark-Sztainer et al., 2002). Body mass index was based on height and weight measurements taken by trained research staff using standardized equipment and procedures, and categories were derived based on Centers for Disease Control and Prevention guidelines (Kuczmarski, Ogden, Grummer-Strawn, Flegal, Guo, Wei, Mei, Curtin, Roche, Johnson, 2000).

Data Analysis

In order to examine the role of social isolation with each dependent variable, a stepwise regression model was built with a series of 6 hierarchical models. Logistic regression modeling was used for the dichotomous variables of suicidal ideation and suicide attempts. Linear regression modeling was used on the continuous variables of depressive symptoms and self-esteem.

Using social isolation as the independent variable, a simple regression was performed for each dependent variable. The basic model, Model 1, consisted of social isolation alone as the independent variable. Model 2 added in the status variables of race, school level, SES, and BMI to the basic model. Models 3, 4, and 5 built on Model 2 by adding family connectedness, academic achievement, and school connectedness, respectively. Model 6 also built on Model 2 and included all three protective factors (family connectedness, academic achievement, and school connectedness). All models were stratified by gender to account for potential gender differences.
RESULTS

Descriptive data for variables of interest are shown in Table 1. Feelings of social isolation were reported in 8.1% of the sample with 6.3% of girls and 9.9% of boys. For psychological health variables, average self-esteem scores (range of 6-24) for the entire sample were 18.0. Average depressive symptom scores for the sample were 10.3 on a scale of 6-18. Approximately 25.6% of the sample reported suicidal ideation, with more girls (32.8%) than boys (18.4%). Approximately 9.4% of the entire sample reported attempting suicide. Again, girls reported higher rates (12.7%) than boys (6.0%).

A linear regression was conducted to investigate the associations between feelings of social isolation and depressive symptoms/self-esteem (see Table 2). This analysis revealed that social isolation was significantly associated with higher depressive symptom scores ($\beta = 1.02$, $SE = 0.19$, $p < 0.001$) and lower self-esteem scores ($\beta = -1.89$, $SE = 0.24$, $p < .001$) in boys. For girls, social isolation was also significantly associated with higher levels of depressive symptoms ($\beta = 0.82$,

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Girls n=2357</th>
<th>Boys n=2377</th>
<th>Total N=4734</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Isolation % (n)</td>
<td>6.3 (144)</td>
<td>9.9 (229)</td>
<td>8.1 (373)</td>
</tr>
<tr>
<td>Self-esteem (range: 6-24)$^\wedge$</td>
<td>17.3 (3.5)</td>
<td>18.7 (3.5)</td>
<td>18.0 (3.6)</td>
</tr>
<tr>
<td>Depressive Symptoms (range: 6-18)$^\wedge$</td>
<td>11.0 (2.8)</td>
<td>9.6 (2.7)</td>
<td>10.3 (2.8)</td>
</tr>
<tr>
<td>Suicidal ideation % (n)</td>
<td>32.8 (727)</td>
<td>18.4 (407)</td>
<td>25.6 (1134)</td>
</tr>
<tr>
<td>Suicide attempts % (n)</td>
<td>12.7 (283)</td>
<td>6.0 (132)</td>
<td>9.4 (415)</td>
</tr>
</tbody>
</table>

Note: $^\wedge$ Mean (standard deviation): higher scores indicates higher levels.

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Table 2

Associations between Social Isolation and Psychological Health; beta estimates (standard error)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-1.89**</td>
<td>-1.83**</td>
<td>-1.38**</td>
<td>-1.70**</td>
<td>-1.79**</td>
<td>-1.31**</td>
</tr>
<tr>
<td></td>
<td>(0.24)</td>
<td>(0.26)</td>
<td>(0.25)</td>
<td>(0.26)</td>
<td>(0.26)</td>
<td>(0.25)</td>
</tr>
<tr>
<td>Depressive</td>
<td>1.02**</td>
<td>1.11**</td>
<td>0.87**</td>
<td>1.02**</td>
<td>1.10**</td>
<td>0.81**</td>
</tr>
<tr>
<td>Symptoms</td>
<td>(0.19)</td>
<td>(0.20)</td>
<td>(0.20)</td>
<td>(0.21)</td>
<td>(0.20)</td>
<td>(0.20)</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-1.64**</td>
<td>-1.18**</td>
<td>-0.92*</td>
<td>-1.14**</td>
<td>-1.24**</td>
<td>-0.96*</td>
</tr>
<tr>
<td></td>
<td>(0.32)</td>
<td>(0.34)</td>
<td>(0.32)</td>
<td>(0.34)</td>
<td>(0.33)</td>
<td>(0.32)</td>
</tr>
<tr>
<td>Depressive</td>
<td>0.82**</td>
<td>0.82*</td>
<td>0.64*</td>
<td>0.76*</td>
<td>0.88**</td>
<td>0.66*</td>
</tr>
<tr>
<td>Symptoms</td>
<td>(0.24)</td>
<td>(0.26)</td>
<td>(0.25)</td>
<td>(0.26)</td>
<td>(0.26)</td>
<td>(0.25)</td>
</tr>
</tbody>
</table>

Note: *p<.01, **p<.001

Model 1 - Social isolation
Model 2 - Social isolation, race, school level, SES, BMI
Model 3 - Social isolation, race, school level, SES, BMI, Family connectedness
Model 4 - Social isolation, race, school level, SES, BMI, GPA
Model 5 - Social isolation, race, school level, SES, BMI, School Connectedness
Model 6 - Social isolation, race, school level, SES, BMI, Family connectedness, GPA, School Connectedness

$SE = 0.24, p < .001$ and lower self-esteem scores ($\beta = -1.64, SE = 0.32, p < 0.001$).

A logistic regression analysis was conducted to investigate the relationship between social isolation and suicide attempts. Model 1 included social isolation as the single independent predictor variable for suicidal behaviors. As shown in Table 3, social isolation was associated with significantly higher odds of suicide attempts among boys (OR = 1.8, CI = 1.1, 3.0) and girls (OR = 1.7, CI = 1.1, 2.7).

When status variables (race, school level, SES, BMI) were included in the model (Model 2), the significant relationships between social isolation and self-esteem, depressive symptoms, and suicide attempts remained for both boys and girls (see Tables 2 and 3).

To examine the influence of protective factors on the relationship, protective factors were added to Model 2 for each dependent variable. The protective factors included in this model were family connectedness (Model 3), academic achievement (GPA) (Model 4), school connectedness (Model 5), and a combined model of family connectedness, academic achievement, and school connectedness (Model 6).
Table 3

Odds ratios (95% CIs) of Suicidal Behavior for Socially Isolated Adolescents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (CI)</td>
<td>OR (CI)</td>
<td>OR (CI)</td>
<td>OR (CI)</td>
<td>OR (CI)</td>
<td>OR (CI)</td>
</tr>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suicidal Ideation</td>
<td>1.1 (0.8,1.6)</td>
<td>1.3 (0.9,1.9)</td>
<td>1.0 (0.6,1.5)</td>
<td>1.2 (0.8,1.8)</td>
<td>1.3 (0.9,1.9)</td>
<td>1.0 (0.7,1.5)</td>
</tr>
<tr>
<td>Suicidal Attempt</td>
<td>1.8* (1.1,3.0)</td>
<td>1.7* (1.0,3.0)</td>
<td>1.3 (0.8,2.3)</td>
<td>1.5 (0.9,2.7)</td>
<td>1.7 (0.9,3.0)</td>
<td>1.3 (0.7,2.3)</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suicidal Ideation</td>
<td>1.3 (0.9,1.9)</td>
<td>1.3 (0.9,1.9)</td>
<td>1.2 (0.8,1.8)</td>
<td>1.3 (0.8,1.9)</td>
<td>1.3 (0.8,2.0)</td>
<td>1.2 (0.8,1.9)</td>
</tr>
<tr>
<td>Suicidal Attempt</td>
<td>1.7* (1.1,2.7)</td>
<td>1.7* (1.0,2.7)</td>
<td>1.4 (0.9,2.5)</td>
<td>1.7* (1.0,2.8)</td>
<td>1.8* (1.1,2.9)</td>
<td>1.6 (0.9,2.6)</td>
</tr>
</tbody>
</table>

Note: *p <0.05

Model 1 - Social isolation
Model 2 - Social isolation, race, school level, SES, BMI
Model 3 - Social isolation, race, school level, SES, BMI, Family connectedness
Model 4 - Social isolation, race, school level, SES, BMI, GPA
Model 5 - Social isolation, race, school level, SES, BMI, School Connectedness
Model 6 - Social isolation, race, school level, SES, BMI, Family connectedness, GPA, School Connectedness

When family connectedness was added to the model as a single protective factor (Model 3), the association between social isolation and lower self-esteem scores ($\beta = -1.38$, $SE = 0.25$, $p < .001$) and higher depressive symptom scores ($\beta = 0.87$, $SE = 0.20$, $p < .001$) remained significant for boys. For girls, the relationship between social isolation and lower levels of self-esteem ($\beta = -0.92$, $SE = 0.32$, $p < 0.01$) and higher depressive symptom scores ($\beta = 0.64$, $SE = 0.25$, $p < 0.01$) also remained significant (see Table 2). However, as shown in Table 3, social isolation was no longer significantly associated with higher odds of suicide attempts in both boys and girls after adjusting for family connectedness and status variables.

When academic achievement (GPA) was added to Model 2 as a single protective factor (Model 4), social isolation remained significantly associated with lower levels of self-esteem and higher levels of depressive symptoms in both boys and girls (see Table 2). As shown in Table 3, increased odds of suicide attempts (OR, 1.7, CI = 1.0, 2.8) for socially isolated girls re-emerged and resembled the odds in Model 2. For boys,
when academic achievement was factored into the model, there was no significant association between social isolation and suicide attempts.

When school connectedness was included as a single protective factor (Model 5), the only significant associations for socially isolated boys were lower self-esteem scores ($\beta = -1.79$, $SE = 0.26$, $p < 0.001$) and higher depressive symptom scores ($\beta = 1.10$, $SE = 0.20$, $p < 0.001$). The linear regression analysis continued to reveal an association between social isolation and lower self-esteem scores ($\beta = -1.24$, $SE = 0.33$, $p < 0.001$) and higher depressive symptom scores ($\beta = 0.88$, $SE = 0.26$, $p < 0.001$) for girls (see Table 2). For girls, but not boys, social isolation was associated with higher odds of suicide attempts (see Table 3).

When all three protective factors (family connectedness, school connectedness, academic achievement) were added into the model (Model 6), the significant relationship between social isolation and lower self-esteem scores ($\beta = -1.31$, $SE = 0.25$, $p < 0.001$) and social isolation and higher depressive symptom scores ($\beta = 0.81$, $SE = 0.20$, $p < 0.001$) remained for boys (see Table 2). Linear regression analysis revealed lower self-esteem scores ($\beta = -0.96$, $SE = 0.32$, $p < 0.01$) and significantly higher depressive symptoms scores ($\beta = 0.66$, $SE = 0.25$, $p = 0.01$) for socially isolated girls (see Table 2). As shown in Table 3, suicide attempts were not significantly associated with social isolation in girls or boys after adjusting for all three protective factors.

**DISCUSSION**

The relationship among social isolation, psychological health, and protective factors remains an important issue in the field of adolescent health. When compared to nonisolated adolescents, students who reported feelings of social isolation had elevated odds of suicide attempts, higher depressive symptoms, and lower levels of self-esteem. Protective factors such as family connectedness, academic achievement, and school connectedness influenced some of the relationships between social isolation and psychological health risks. In general, associations between social isolation from peers and psychological health remained strong even after adjusting for these protective factors, suggesting the importance of close peer relationships. Of particular interest were the differences in the influence of protective factors across gender groups.

Even after accounting for protective factors, social isolation remained significantly associated with symptoms of depressive and lower levels of self-esteem. Previous literature supports the view that psycho-
logical well-being in the adolescent years is heavily reliant on the quality of peer relationships. It may be the case that psychosocial functioning and self-esteem are so dependent upon peer relationships in adolescence that it is difficult to separate these constructs. The feelings of sadness and emptiness associated with social isolation may lower self-esteem and increase feelings of depression (Rubin & Mills, 1988). In turn, feelings of depression and low self-esteem may contribute to additional peer relationship problems and increased feelings of social isolation.

One of the strongest protective influences was a feeling of connection with family, particularly against suicide attempts in socially isolated adolescents. Whenever family connectedness was included in the model, the relationship between suicide attempts and social isolation was no longer significant in either boys or girls. This finding is interesting because it suggests that in spite of some of the negative influences of social isolation such as decreased self-esteem and increased depressive symptoms which are established antecedents to suicidal ideation and suicide attempts (Guyer, McDorman, Martin, Peters, Strobino, 1998), the protective elements of family connectedness provided a buffer against suicide attempts. Although socially isolated adolescents may have increased risk for feelings of depression and lower self-esteem, these negative feelings may not escalate into suicidal behavior if there is a connection to family.

Some of the most interesting findings in this study were the differences across gender. For girls, family connectedness was the only protective factor that influenced the relationship between social isolation and of suicide attempts. Family connectedness did represent a protective factor for suicide attempts for boys; however, other factors such as academic achievement and school connectedness were also protective. Other investigators have noted that girls often place more value and consequently, feelings of self-worth, on the quality of their family relationships (Allgood-Merten, Lewinsohn, & Hops, 1990; Tomori, Zalar, & Plesnicar, 2000). In general, adolescent girls describe closeness and emotional intimacy as a fundamental quality in a relationship (Bakken & Romig, 1992; Claes, 1992; Clark & Ayers, 1993). For girls without close peer relationships, strong connections to family may compensate for the vulnerability to risk associated with feelings of social isolation. Family relationships may fulfill a need for intimacy that is important to adolescent girls. It is possible that the degree of emotional intimacy needed to influence psychological well-being in socially isolated girls may not be achieved in relationships with school
staff or by a sense of achievement in school. Therefore, socially isolated girls may find the most protective elements in relationships with family members.

Although family connectedness was a significant protective factor for boys, academic achievement and school connectedness also mediated the negative influence of social isolation. Previous studies have suggested that a connection to school represents a protective factor against a variety of adolescent risk behaviors (Resnick et al., 1993; Resnick et al., 1997; Steinberg, 1996). It is noteworthy that in the present study, school connectedness and academic achievement were uniquely protective for boys. It may be that adolescent boys are able to derive protective benefits from a more diverse range of factors in their environment. Furthermore, it is possible that this finding represents a gender difference in that girls are socialized to value or need close relationships, whereas achievement (e.g., academic achievement, school connectedness) may be more emphasized in males and thus more protective.

The important influence of connections to adults represents an interesting contradiction of the adolescent developmental time period. Traditionally, adolescence involves a movement away from the family unit toward an identity within the peer group. One of the most salient aspects of adolescence is the desire for increased freedom and responsibilities (Erickson, 1968). Although adolescents may distance themselves from parents and adults, adolescence may also be a time in which the protective benefits of relationships with adults make unique and powerful contributions in promoting psychological health. Meaningful connections to adults may be especially important for adolescents who do not have close relationships with peers.

**Strengths**

This study offers several unique contributions to the field of adolescent health literature. To our knowledge, it is the first to explore the relationship between social isolation, risks, and protective factors in a large, diverse sample of adolescents. The combination of multiple risk and protective factors offers a complex view of the multiple influences in the lives of adolescents. Further, the inclusion of protective factors suggests potential pathways for healthy adolescent development and strategies for prevention and intervention. Additionally, the sample used in the current study yields results that may be more generalizable to the larger adolescent population than previous studies which have utilized clinical or high-risk samples of adolescents. Finally, the sample was large enough to conduct statistically valid analysis on a fairly small subgroup of adolescents.
Limitations

In reviewing these results, it is also important to consider some of the limitations of this research study. The current study measured the construct of social isolation based on one question. Social isolation was measured as students who reported not having close friends with whom they could talk about their problems. This single response may not provide a comprehensive picture of feelings of social isolation in adolescents. Further, this response was a measure of perceived social isolation. Although the perception provides valuable information, it may also be influenced by the outcomes of low self-esteem and depression. It would be interesting to learn if a more thorough assessment of social isolation would produce similar results. Additionally, the data used for this study are cross-sectional; therefore, causation cannot be inferred from these results. Based on this analysis, it is unclear whether social isolation causes psychological problems or whether adolescents with psychological problems isolate themselves from peers. Longitudinal data on the association between social isolation, risk, and protective factors would contribute to greater understanding of this relationship.

Future Directions

As researchers continue to evaluate the complex relationship among social isolation, psychological health, as well as protective factors, it is recommended that the significance of feelings of social isolation as well the role of meaningful protective factors in adolescence be reconceptualized. The comparative influences of protective factors between gender groups merits further exploration. This analysis of protective influences could also extend to differences across age and school level (e.g., middle school versus high school). Further, the conceptualization of protective factors should be expanded to include a broad variety of potential protective influences in the lives of adolescents. Of particular interest are community involvement, faith-based communities, and extra-curricular activities in the lives of socially isolated adolescents.

Practical Implications

There is much discussion about the negative influences of peers during adolescence. Yet, this study highlights the key role that peers play in the psychological health of adolescents. Adolescents who feel close connections to peers are at decreased risk for poor psychological health outcomes such as depression, poor self-esteem, and suicidal behavior. This emphasizes the importance of high quality peer relationships. Parents can support the development of peer relationships by promot-
ing positive peer relationships from a young age. Further, parents can have a powerful influence on relationship development by role modeling healthy relationships with their own adult peers.

The findings of this study also highlight the significance of connections to family during the adolescent years. The development and maintenance of quality relationships is a vital component of adolescent and family relations. It is important that families with adolescents be aware of the importance of family connectedness. Prevention programs and interventions with adolescents should include focus on promoting these strong family connections, particularly for those who lack close peer connections.

Schools also offer great potential for prevention and intervention in reducing adolescent health risks. School-based intervention programs can help develop the protective elements of peer friendships, meaningful relationships with adults, academic achievement, and school connections for socially isolated adolescents. Support personnel such as social workers, counselors, and school psychologists are well positioned to develop intervention and prevention programming.

REFERENCES


