RELATIONSHIPS WITH PARENTS AND FRIENDS, SELF-ESTEEM AND DEPRESSION AMONG ADOLESCENTS WITH VISUAL IMPAIRMENTS

By Taina Maarit Huurre, Erkki Juhani Komulainen, and Hillevi Marita Aro

Abstract: Social relationships with parents and friends, depression, and the mediating role of self-esteem between relationships and depression were studied among 115 adolescents with visual impairments attending regular Finnish schools. The control group consisted of normally sighted classmates of visually impaired adolescents (N=607). The data were collected using a self-report questionnaire.

The results showed no significant difference in the prevalence of depression between visually impaired adolescents and the control group. However, there was a trend toward an excessive risk of depression among girls with visual impairments compared to girls without visual impairments. In addition to being male, higher scores of relationships with friends was an important protective factor against depression among adolescents with visual impairments. The impact of relationships with friends, on depressive symptoms was mediated through self-esteem. Unlike in controls, relationships with parents was not an explanatory factor of depression in adolescents with visual impairments. The mechanisms and processes explaining the various effects of relationships with parents and friends on self-esteem and depression need further investigation through longitudinal studies.

Introduction

Adolescence is characterized by multiple and simultaneous changes in development, converging to create a period of marked transition and demands for adjustment (Vondra & Garbarino, 1988). Most adolescents successfully negotiate this developmental period without any psychological problems, develop a positive sense of personal identity, and manage to forge adaptive peer relationships and at the same time maintain close relationships with their families (Petersen et al., 1993).
The period of adolescence can cause a great deal of anxiety for the person with physical disabilities, who faces not only the usual developmental challenges but also the added strain of his or her physical disability. Somatic illness or disability may be a risk factor in psychosocial development. The results of empirical studies are, however, somewhat contradictory. Some studies have reported that adolescents with somatic illnesses or disabilities have problems in their psychosocial development (Cadman et al., 1987; Gortmamaker et al., 1990; Stevens et al., 1996; Wolman et al., 1994). Others studies suggest that these adolescents are not at higher risk for psychopathology than their healthy counterparts (Bussing & Aro, 1996; Cappelli et al., 1989). Factors such as the selection of the groups and difficult outcome measures, method of data collection, and type of illness or disability may account for some of the reported differences.

Little research has been conducted on psychological well-being and adjustment of visually impaired adolescents. Some studies have found that adolescents with visual impairments may have an at increased risk for depression and psychological problems (Abolfotouh & Telmesani, 1993; Jan et al., 1977; Van Hasselt et al., 1986). Visual impairments may cause adolescents to feel inadequate and inferior (Beaty, 1992; Meighan, 1971). It has also been found that many adolescents and young adults with visual impairments have problems in their relationships with friends. Many of them have been reported to be socially isolated, with fewer friends and smaller social networks than normally sighted adolescents (Eaglestein, 1975; Huurre & Aro, 1998; Kef, 1999; Van Hasselt, 1983; Wesolowski, 1987).

Disability or chronic illness often causes added demands in family life and problems in family relationships (Patterson & Blum, 1996). Most visually impaired adolescents have, however, reported that their relationship with parents are close and that they receive social support mainly from their family members (Huurre & Aro, 1998; Kef, 1999; Nemshick et al, 1986; Wolfe & Sacks, 1997).

Social relations have been considered essential to the maintenance and promotion of psychological health and well-being (Nestmann & Hurrelmann, 1994). In close relationships with siblings, friends, or parents, children and adolescents may experience acceptance and support which is likely to be tied to psychological well-being. Rejection in these relationships could be linked to feelings of loneliness or inadequacy (Stocker, 1994). Among adolescents with visual impairments increased isolation due to physical limitations of disability, difficulties in socialization, along with the problems in adjustment to visual impairments may contribute to an increased incidence of psychological problems (Ammerman et al., 1986; Jan et al., 1977). Low perceived peer acceptance
and support can lead to depression (Varni et al., 1991), as well as to further isolation (Blum, 1991; Blum, 1992).

The purpose of the present study was to investigate first, whether adolescents with visual impairments and those without it differ in the prevalence of depression and in relationships with parents and friends. Second, we studied whether relationships with parents and friends protect adolescents from depression. On the basis of our previous study (Huurre et al., 1999), indicating that relationships with parents and friends significantly contributed in variable ways to the self-esteem of adolescents with and without visual impairments, we further investigated here, what the role of self-esteem is in mediating the impact of relationships with parents and friends leading to depressive symptoms.

Methods

Subjects
The study population comprised two cohorts, one studied in 1993-1994 and the other in 1996-1997, of Finnish-speaking adolescents with visual impairments integrated in grades 7-9 in regular comprehensive schools throughout Finland. The participants with visual impairments were obtained from the National Register of the School for the Visually Impaired in Jyväskylä and were free of additional disabling conditions, such as hearing or physical impairment, intellectual impairment or cerebral palsy. Cohort 1 consisted of 40 boys and 14 girls and cohort 2 of 36 boys and 25 girls. The total number of adolescents with visual impairments was thus 115 (boys 76, girls 39), 94 (67 boys and 27 girls) with low vision and 21 (9 boys and 12 girls) who were blind and were braille readers. Among those for whom detailed ophthalmological information was available from the Finnish Register of Visual Impairment (N=103; 90 %) 65 % had moderate low vision and 11% had severe low vision. Adolescents with visual impairment ranged in age from 13 to 16 (mean age 14.1 years, SD 0.87); 38% of the boys and 55% of the girls had been visually impaired since birth. The predominant causes of visual impairment were congenital malformations, neuro-ophthalmological diseases and retinal diseases.

The control group consisted of normally sighted classmates of 66 visually impaired adolescents (cohort 1: n=410; cohort 2: n=241) in comprehensive schools throughout Finland. The 44 classmates without visual impairments reporting that they had chronic conditions (such as asthma, and diabetes mellitus) interfering with their daily lives were excluded from the control group. Thus, the total number of participants in the control group was 607 (275 boys and 332 girls). These participants ranged in age from 12 to 17 (mean age 14.0 years (SD=0.88).
Measures
The data were collected using a self-report questionnaire. The short, 13-item Beck's Depression Inventory (S-BDI), modified for Finnish population studies by inclusion of introductory questions and an additional positive choice of answer for each item, which do not affect the rating of depression, was used as a screening instrument for depression (Beck & Beck, 1972; Mattlar et al., 1987). The sum score of depressive symptoms range from 0 to 39. The Cronbach alpha reliability rate for the scale was 0.83 for adolescents with visual impairments and 0.84 for those without visual impairments. Subjects with an S-BDI score of five or above were classified as depressed (Beck & Beck, 1972).

Self-esteem was measured using a 5-point scale developed for Finnish school students (Helenius & Lyttinen, 1974; Aro, 1988). The scale consisted of seven statements of self-worth resembling those used in Rosenberg's measure (Rosenberg, 1965). The statements were: "I believe in myself and my possibilities; I wish I were different from what I am; I suffer from feelings of inferiority; I think I have many good qualities; I feel I lack self-confidence; I am capable of doing the same things as others; I am often dissatisfied with myself". The theoretical range of the scale scores was 7 to 35. The internal reliability rate of the scores (using Cronbach's alfa coefficient) was 0.76 for adolescents with visual impairments, and 0.81 for those without visual impairments.

Relationship with parents. The quality of the relationship with parents was assessed with three questions on participants' relationship with their mothers and fathers and on the family climate, measured on a 5-point scale. The questions related to relationships with parents were previously used in Finnish follow-up study of young adults (Palosaari et al. 1996, Tulisalo & Aro, 2000). The theoretical range of the scale scores was 3 to 15. The Cronbach alpha reliability rate for the scale was 0.74 for adolescents with visual impairments and 0.71 for those without visual impairments.

Relationships with friends. Relationships with friends were measured, on a 5-point scale, on the basis of three statements related to the degree of social integration with friends: "I have many friends", "I fit in easily with other young people" and "It is easy for me to make friends". The statements related to number of friends, easiness of making friends and being together with friends have previously been used in a Finnish study of adolescents' social support, loneliness and self-esteem (Välitmaa et al. 1994). The theoretical range of the scale scores was 3 to 15. The Cronbach alpha reliability rate for the scale was 0.75 for adolescents with visual impairments and 0.74 for those without visual impairments.
The participants were grouped into two social classes: blue and white collar, on the basis of the standard classification of occupations (Tilastokeskus, 1989), primarily using the father's occupation, or if not available, that of the mother. The blue collar group included, for example, industrial workers, forest workers and farmers and the white collar group included professions such as nurses, physicians, bank employees and teachers. The two categories of family structure were intact families, with two original parents, and others, including one-parent families, stepfamilies and also some children in institutional care. The severity of visual impairment was divided into categories of blind (braille users) and low vision and the age of onset of visual impairment was divided into onset at birth (under age 1) or after birth (age 1 or older).

Procedure
The questionnaire was transcribed into braille for blind participants and into large print for those with low vision. The blind participants used computers as aids to respond to the questionnaires. Adolescents without visual impairments were provided with similar questionnaires in regular print, except that all questions directly relating to visual impairment were excluded. The questionnaire was pilot tested with 10 adolescents with visual impairments and those without it.

The data were collected in collaboration with school principals or teachers. The pupils completed the questionnaires in the classroom during school hours. At first, the teachers told the pupils about the purpose of the study following the researchers’ detailed instructions and then handed out the questionnaires to the pupils, who answered confidentially and returned their questionnaires in sealed envelopes to the teachers. It took most participants about 45 minutes to complete the questionnaire; the blind adolescents needed more time.

The response rate was 100% in cohort 1 and 88.9% in cohort 2 among adolescents with visual impairments, and 98.3% in cohort 1 and 94.9% in cohort 2 among normally sighted subjects. Of the visually impaired, 26 filled in the questionnaires during their support period in the School for the Visually Impaired in Jyväskylä, 78 completed them during school hours under the supervision of itinerant (N=12) or other teachers (N=66), and 11 completed them at home. Of those without visual impairments, 604 completed the questionnaires during school hours at the same time as their 66 classmates with visual impairments did, and 3 completed them at home.

Statistical Analyses
The proportions and means of adolescents with visual impairments were compared with those of subjects with normal vision separately by gender. Differences between proportions in groups were analyzed by the chi-square and differences in means were analyzed using the one-way
analysis of variance followed by post hoc tests using the Scheffé procedure. The explanation and prediction of depression was summarized using logistic regression. The model building was done according to established lines of this analytical tradition ((Homer & Lemeshow, 1989; Menard, 1995). Structural equation methodology (SEM) was used to assess the latent trait recursive causal model, where the construct of self-esteem was integrated and the trait depressive symptoms was treated as the target of explanation (Jöreskog & Sörbom, 1993).

Variable diagnostics were carried out to estimate the fit of the data with binary logistic regression and SEM. The analysis showed that continuos predictor variables had a small and partly significant non-linear component to the logit of being depressed. This was, at least partly, due to the fact that the continuos predictors were negatively skewed. Windsorizing the tails changed, however, affected the results only marginally. Their relations towards depression was additive (interactive component being absent).

These deviations from assumptions in binary regression as well as SEM (carried out using LISREL 8.3, see Jöreskog & Sörbom, 1989, 1993, 1999; Byrne, 1998) did not prove to be any notable source if error in the data-analysis. The analysis was repeated without deviant or influential cases, with results remaining essentially unaffected by their elimination. In the SEM analysis the variance-covariance matrix was used. Parallel analysis with the same results were carried out with AMOS4 (Arbuckle & Wothke, 1999). The asymptotic covariance matrix was also used. Differences were small.

The chi-square test, the normed (NFI) and the adjusted goodness of fit index (AGFI), and the root mean square of approximation (RMSEA) were the primary criteria for assessing the model in the SEM-analysis. Some thought was given to the null-model. But in similar vain the competing alternative model, where the path from gender went via depressive symptoms to self-esteem, was evaluated. The GI-indices had to be above 0.9 and RMSEA so close as possible to 0.0 with narrow CI in an acceptable model. No accurate test could be used in comparing alternative models. They were not tested. The generally adopted lines of SEM tradition were followed in these steps (Bollen, 1989; Kelloway, 1998; Maruyama, 1998). Biological sex was the only indicator of gender. Its error was fixed to 0.0 and the coefficient from gender to 1.0. Indicators of self-esteem and depressive symptoms consisted of odd and even items of respective instruments. Also the other indicators (except gender, were continuos at least on a 5-point scale.
Results
Depression, self-esteem and relationships with parents and friends among boys and girls by visual impairments

At first, we investigated whether adolescent boys and girls with visual impairments differed in the prevalence of depression from those without visual impairments (see Table 1). Depressive symptoms and the prevalence of depression were higher among girls than boys whether they were visually impaired or not. The female-to-male ratio was (5:1) among adolescents with visual impairments and (2:1) in those without visual impairments. Gender-specific analyses showed no statistically significant difference in depressive symptoms and the prevalence of depression between visually impaired adolescents and the control group. However, there was a trend toward an excessive risk of depression among girls with visual impairments (31%) compared to girls without visual impairments (23%). In addition, of depressed girls with visual impairments, 21% reported moderate or severe depression compared to 12% of girls in the control group. Among boys, unexpectedly, visually impaired boys tended to score less often in the depressed range (7%) than boys without visual impairments (12%).

The self-esteem of girls with visual impairments tended to be lower than that of girls without visual impairments. No such difference was seen among the boys. Girls with visual impairments also reported statistically significantly lower scores of relationships with friends than normally sighted girls (p<.05). No significant differences were found in relationship with parents between adolescents with visual impairments and those without it by gender. Adolescents with visual impairments did not differ in depression, self-esteem and relationships by the severity and onset of visual impairment.

Relationships with parents and friends as a factor protecting from depression among adolescents with visual impairments and those without it.

Second, we studied, whether relationships with parents and friends protect adolescents from depression. Logistic regression analyses were carried out to explain depression separately for adolescents with visual impairments and those without it. The explanatory variables included gender, factors related to family (social class, family structure), relationships with parents and friends and also severity and onset of visual impairments among adolescents with visual impairments.

The results showed that in addition to being male, higher scores of relationships with friends were an important protective factor against depression among adolescents with visual impairments and those without it (see Table 2). Among adolescents without visual impairments also relationships with
parents were an explanatory factor of depression (see Table 3). Factors related to visual impairments and family were no significant predictors of depression.

Self-esteem in mediating factor between relationships with parents and friends and depressive symptoms

In further analyses, we utilized SEM-technology to investigate the role of self-esteem as a mediating factor between relationships with parents and friends and depressive symptoms among adolescents with visual impairments and those without it. Analysis of the mediator role of self-esteem between relationships and depressive symptoms was based on earlier evidence (Kelly et al., 1993; Harter & Jackson, 1993) and our preliminary findings from traditional path analyses. The hypothetical model contained five latent constructs: relationship with friends, relationship with parents, gender, self-esteem and depressive symptoms. Manifest indicators for self-esteem and depressive symptoms were built up from adding the odd and even items of the scales. The model was recursive.

The results showed that the effect of relationships with friends on depressive symptoms mediated via self-esteem among adolescents with visual impairments and those without it. A direct effect of relationship with parents and indirect effect through self-esteem with depressive symptoms was present only among adolescents without visual impairments. In addition, self-esteem was a moderating factor between gender and depressive symptoms (see Figure 1, Table 4).

Discussion

The study population was nationwide, including two age cohorts of adolescents with visual impairments and those without it. The participation rate was very high, making the study highly representative. However, the number of visually impaired adolescents was relatively small, which may weaken the generalizability of the results. As the focus of the study was on subjective matters, the use of self-reporting questionnaires can be considered appropriate, though it shares some of the general problems of questionnaire studies. Ninety-eight percent of the questionnaires were completed in classrooms, where the situation was better controlled and less open to bias than with postal questionnaires.

Modified 13-item Beck's Depression Inventory (RS-BDI) used in population studies of Finnish young people (Palosaari & Aro, 1995; Palosaari et al., 1996) is a self-report screening instrument. Thus, it does not necessarily refer to depression of clinical severity. The scale, however, is widely used and it has been shown to be valid measure for screening depression (Beck & Beck, 1972; Beck et al., 1974; Kaltiala-Heino et al. 1999). The measures of
relationships with parents and friends were brief and somewhat crude and thus our results may serve as hypotheses for further research with more sophisticated measures.

The adolescent phase of life is associated with an increased occurrence of emotional difficulties, such as depression, suicidal ideation, and depressive symptoms (Petersen, 1988; Birmaher et al., 1996; Brooks-Gunn & Petersen, 1991). Although the number of adolescents who experience emotional difficulties increases, most adolescents traverse this period of life without any significant psychological difficulties. This was also evident in our study.

Our results showed no significant difference in depressive symptoms and the prevalence of depression between visually impaired adolescents and the control group. However, there was a trend toward an excessive risk of depression among girls with visual impairments compared to girls without visual impairments. Due to the small number of visually impaired adolescents the results should be generalized with caution and need replication.

Several studies have identified a gender difference in prevalence of depression in adolescence showing a higher prevalence among girls than boys (e.g. Canaille et al., 1993; Larsson & Melin, 1990; Olsson & von Knorring, 1997). Our study is in agreement with these studies. The prevalence of depression was higher among the girls than boys, whether they were visually impaired or not. However, among adolescents with visual impairments the female-to-male ratio was higher (5:1) than among controls (2:1) or in earlier adolescent samples (Bebbington, 1988). Based on our findings and earlier studies (Huurre, Komulainen & Aro, 1999; Kef, 1999) it seems likely, that in adolescence, visual impairment causes stress especially in girls. On the other hand, our study did not measure other aspects of well-being. For example, it has been suggested that alcohol use and antisocial behavior may be more typically expressive of ill-health in boys (Aro, 1994). Gender differences in depression may also be linked to different coping mechanisms, which might be more effective among the visually impaired boys. It is also possible that visually impaired boys may repress or deny those problems related to visual impairments or they may not be willing to report them to other people.

Self-esteem plays an important role in mental health (Bolognini et al., 1996). Previous research has documented a substantial correlation between self-esteem and depression (e.g. Chubb et al., 1997; Harter & Jackson, 1993). We further investigated the mediating role of self-esteem between gender and depressive symptoms and found that an excessive risk of depression was mediated via low-self-esteem. This
mediating role of self-esteem may be connected to gender differences in self-esteem and strong relations between self-esteem and depression, as has been found in earlier studies (Bolognini et al., 1996; Chubb et al., 1997; Harter & Jackson, 1993). The directionality of self-esteem and depression cannot be assessed in a cross-sectional study. The possibility remains that low self-esteem is secondary to depression. The associations found, however, remain interesting and deserve closer investigation in future follow-up studies.

During adolescence, youngsters change in the way they interact and relate to family and peers. Despite the adolescent’s increasing interest in peer relations, family ties still remain strong and critically important for most adolescents. Both family and peer relations contribute significantly in multiple ways to psychosocial development in adolescence (e.g. Hunter, 1985). They serve as complementary rather than competitive influences on youths (Damon, 1983; Kirchler et al., 1993; Youniss & Haynie, 1992).

In our study, relationships with parents and friends had an effect on depression among adolescents with visual impairments different from that among adolescents without visual impairments. In both groups, higher scores of relationships with friends, indicating higher degree of social integration with friends, reflected resilience against depression via self-esteem, but a direct effect of relationships with parents and an indirect effect of relationship with parents through self-esteem with depressive symptoms was present only among adolescents without visual impairments. The findings are interesting. The accentuated role of friends in the psychological development of visually impaired adolescents may be linked to the increased vulnerability and difficulties in relationships with friends, as reported in many studies (Eaglestein 1975; Huurre & Aro, 1998; Wolfe & Sacks, 1997). The limitations caused by visual impairment may be more pronounced in adolescence, when social contacts, friends and dating become very important. It should not, however, lead to underestimate the important role of the family in the visually impaired adolescent’s psychological development. Most visually impaired adolescents in our study reported that they had close relations with their parents, there was even a trend that they described their family relations as slightly better than those without visual impairments. Thus, it seems likely that visually impaired adolescents get the attention which they need from their parents. It may even be that good relationships with parents among visually impaired adolescents also serve as a buffer against depression. Future studies are needed for a better understanding of the roles of parents and friends in pathways leading to psychological problems.
In summary, this study showed no significant difference in the prevalence of depression between visually impaired adolescents and the control group. However, girls with visual impairments tended to have an excessive risk of depression. In addition to being male, higher scores of relationships with friends, indicating higher degree of social integration with friends, was an important protective factor against depression among adolescents with visual impairments. The impact of relationships with friends on depressive symptoms was mediated through self-esteem. Unlike in controls, relationships with parents was not an explanatory factor of depression in adolescents with visual impairments. The mechanisms and processes explaining the various effects of relationships with parents and friends on self-esteem and depression also need further investigation through longitudinal studies.

Figure 1 Relationships with parents and friends, self-esteem and depressive symptoms among adolescents with and without visual impairments. Accuracy of fit=0.93 (0.98); Normed goodness of fit=0.89 (0.97); Adjusted goodness of fit=0.88 (0.97); Root mean square residuals (RMSEA)=0.06 (0.04); \( \chi^2=48.87 \) (64.11), df=36 (36), p=0.07 (0.0)
Table 1: Depression, self-esteem and relationships with parents and friends among boys and girls by visual impairments (VI)

<table>
<thead>
<tr>
<th></th>
<th>Boys with VI (N=76)</th>
<th>Boys without VI (N=274)</th>
<th>Girls with VI (N=39)</th>
<th>Girls without VI (N=330)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEPRESSION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>1.2 (2.4)</td>
<td>1.7 (3.0)</td>
<td>3.3 (4.0)</td>
<td>3.1 (3.9)</td>
</tr>
<tr>
<td>score, mean (SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression prevalence</td>
<td>6.6 (5)</td>
<td>11.7 (32)</td>
<td>30.8 (12)</td>
<td>23.3 (77)</td>
</tr>
<tr>
<td>% (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity of depression</td>
<td>93.4 (71)</td>
<td>88.3 (242)</td>
<td>69.2 (27)</td>
<td>76.7 (253)</td>
</tr>
<tr>
<td>No depression (0-4 points)</td>
<td>93.4 (71)</td>
<td>88.3 (242)</td>
<td>69.2 (27)</td>
<td>76.7 (253)</td>
</tr>
<tr>
<td>Mild depression (5-7 points)</td>
<td>3.9 (3)</td>
<td>7.3 (20)</td>
<td>10.3 (4)</td>
<td>11.5 (38)</td>
</tr>
<tr>
<td>Moderate depression (8-15 points)</td>
<td>2.6 (2)</td>
<td>3.6 (10)</td>
<td>20.5 (8)</td>
<td>9.7 (32)</td>
</tr>
<tr>
<td>Severe depression (16 or more points)</td>
<td>0 (0)</td>
<td>0.7 (2)</td>
<td>0 (0)</td>
<td>2.1 (7)</td>
</tr>
<tr>
<td><strong>SELF-ESTEEM,</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean (SD)</td>
<td>27.1 (4.1)</td>
<td>26.8 (4.5)</td>
<td>22.7 (5.6)</td>
<td>24.1 (5.1)</td>
</tr>
<tr>
<td>RELATIONSHIP WITH PARENTS, mean (SD)\a</td>
<td>13.1 (1.9)</td>
<td>12.6 (1.8)</td>
<td>12.4 (2.3)</td>
<td>11.9 (2.1)</td>
</tr>
<tr>
<td>RELATIONSHIPS WITH FRIENDS, mean (SD)\b</td>
<td>11.0 (2.8)</td>
<td>11.3 (2.5)</td>
<td>9.7 (3.2)</td>
<td>11.2 (2.5)\c</td>
</tr>
</tbody>
</table>

\a One-way ANOVA F=9.32, p<.001, \b F=4.39, p<.005, \c Difference in means between girls with and without VI; p<.05

Table 2: Depression regressed on gender, relationships with parents and friends among adolescents with visual impairments

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>B</th>
<th>p</th>
<th>$R^2_L$</th>
<th>standardized logistic regression coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-.533</td>
<td>.013</td>
<td>.072</td>
<td>-.402</td>
</tr>
<tr>
<td>Relationship with parents</td>
<td>-.152</td>
<td>.261</td>
<td>.013</td>
<td>-.174</td>
</tr>
<tr>
<td>Relationships with friends</td>
<td>-.303</td>
<td>.005</td>
<td>.102</td>
<td>-.504</td>
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</table>

Goodness-of-fit tests

<table>
<thead>
<tr>
<th>Method</th>
<th>Chi-Square</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson</td>
<td>77.59</td>
<td>75</td>
<td>0.40</td>
</tr>
<tr>
<td>Deviance</td>
<td>55.12</td>
<td>75</td>
<td>0.96</td>
</tr>
<tr>
<td>Hosmer and Lemeshow Brown:</td>
<td>15.61</td>
<td>8</td>
<td>0.05</td>
</tr>
<tr>
<td>General Alternative</td>
<td>3.48</td>
<td>2</td>
<td>0.18</td>
</tr>
<tr>
<td>Symmetric Alternative</td>
<td>3.39</td>
<td>1</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Predictive efficiency

tau-p=0.586
lambda-p=0.294
Kappa (Cohen)=0.486

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### Table 3: Depression regressed on gender, relationships with parents and friends among adolescents without visual impairments

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>B</th>
<th>p</th>
<th>(R^2_L)</th>
<th>Standardized logistic regression coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-.698</td>
<td>.005</td>
<td>.015</td>
<td>-.192</td>
</tr>
<tr>
<td>Relationship with parents</td>
<td>-.328</td>
<td>.000</td>
<td>.064</td>
<td>-.369</td>
</tr>
<tr>
<td>Relationships with friends</td>
<td>-.215</td>
<td>.000</td>
<td>.040</td>
<td>-.294</td>
</tr>
</tbody>
</table>

**Goodness-of-fit tests**

- **Method**
  - Pearson
    - Chi-Square: 174.74, df: 144, p: 0.04
  - Deviance: 171.29, df: 144, p: 0.06
  - Hosmer and Lemeshow: 3.62, df: 8, p: 0.89
- **Brown**
  - General Alternative: 1.61, df: 2, p: 0.45
  - Symmetric Alternative: 0.66, df: 1, p: 0.42
  - Predictive efficiency
    - \(\tau_p=0.424\)
    - \(\lambda_p=0.055\)
    - Kappa (Cohen)=0.212

### Table 4: Direct, indirect (through self-esteem), and total effects on depressive symptoms among adolescents with and without visual impairments (VI)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indirect effect</th>
<th>Direct effect</th>
<th>Total effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WITH VI</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.183</td>
<td>-</td>
<td>0.183</td>
</tr>
<tr>
<td>Relationships with parents</td>
<td>-0.047</td>
<td>-0.117</td>
<td>-0.165</td>
</tr>
<tr>
<td>Relationships with friends</td>
<td>-0.307</td>
<td>-0.234</td>
<td>-0.541</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-</td>
<td>-0.571</td>
<td>-0.571</td>
</tr>
<tr>
<td><strong>WITHOUT VI</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.132</td>
<td>-</td>
<td>0.132</td>
</tr>
<tr>
<td>Relationship with parents</td>
<td>-0.178</td>
<td>-0.223</td>
<td>-0.401</td>
</tr>
<tr>
<td>Relationships with friends</td>
<td>-0.228</td>
<td>-0.087</td>
<td>-0.314</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-</td>
<td>-0.566</td>
<td>-0.566</td>
</tr>
</tbody>
</table>

* \(p<.05; ^{b}p<.01; ^{c}p<.001; ^{d}p<.10; ^{e}ns \)

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Acknowledgments: This study was supported by a grant from the Yrjö Jahnsson and Juho Vainio Foundations.

Note: Adolescents without visual impairments—in parenthesis

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RELATIONSHIPS WITH PARENTS AND FRIENDS, SELF-ESTEEM AND DEPRESSION AMONG ADOLESCENTS WITH VISUAL IMPAIRMENTS


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