Environmental Stressors and Emotional Status of Adolescents Who Have Been in Special Education Classes

Iris Wagman Borowsky, MD, PhD; Michael D. Resnick, PhD

Objective: To identify environmental and psychosocial factors associated with receiving special education services.


Setting: Minnesota public schools.

Participants: A total of 121,848 adolescents in the 6th, 9th, and 12th grades.

Main Outcome Measures: Emotional status and potential environmental risk factors including family structure, family substance use problems, family violence, and sexual abuse were compared between adolescents reporting a history of having been in classes for learning problems and a grade- and race-matched comparison group of adolescents who had never been in classes for learning problems. Comparisons were conducted separately for male and female respondents.

Results: Compared with adolescents who had never been in classes for learning problems, a significantly greater proportion of male and female students who had been in special education classes lived in single-parent and nontraditional households, indicated that a family member had an alcohol or other drug problem, had witnessed or experienced physical abuse, and reported a history of sexual abuse and poor emotional health. Most of these associations remained significant when simultaneously controlling for the other factors in logistic regression. Significant factors showed modest odds ratios in the multivariate analyses (<1.6), except for the emotional status variable. Students with a history of receiving special education services had from 6 to 14 times the odds of reporting poor emotional health. This association was strongest among the youngest adolescents.

Conclusion: Several environmental stressors and psychosocial factors, most notably poor emotional health, are associated with a history of special class placement for learning problems.


Editor’s Note: The correlation of attending special education classes and poor emotional health might not be surprising, but the large proportion of adolescents involved is—at least to me. I wonder what the results would be of a similar study involving an inner-city, underrepresented minority population.

Catherine D. DeAngelis, MD

Approximately 10% of children between 6 and 17 years of age receive special education and related services, and an estimated 750,000 neonates each year may be at risk for having developmental disabilities. Therefore, pediatricians frequently encounter patients who have school learning and behavior problems or are at risk for them.

In 1975, Congress passed Public Law 94-142, the Education for All Handicapped Children Act, which guarantees children with disabilities a free and appropriate education. Since that time, the number of children and adolescents receiving special education services has increased from approximately 3.7 million in the 1976-1977 school year to 5.4 million in the 1994-1995 school year, and funds allocated for these services have increased from about $373 million to $2.32 billion in the same period. Most of this growth is attributed to increases in the number of students identified with specific learning disabilities, a group that now comprises more than 50% of children in special education. The majority of other students receiving special education services have been categorized as speech or language impaired, mentally retarded, or emotionally disturbed.
Subjects and Methods

Data Source

Data were obtained from the 1992 Minnesota Student Survey, an anonymous, voluntary, self-administered questionnaire given to 131,000 public school students in grades 6, 9, and 12. All but 1 of the 433 school districts in Minnesota participated in the survey, and fewer than 3% of surveys were excluded because of questionable accuracy. The survey is a comprehensive assessment of health risk environments and behaviors among adolescents. Survey development, content, and cleaning and editing procedures are described elsewhere.14 The questionnaire is designed at the 5th-grade reading level, with a completion time of approximately 1 hour. Parents were informed about the survey in advance and could choose not to have their children participate. At the time of survey administration, students could choose not to take the survey, or they could skip any question or stop at any time. The survey is administered every 3 years, followed by a series of state and regional dissemination conferences designed to facilitate use of the dataset for curriculum planning, policy and program development, and evaluation. With near-universal participation by school districts and a school retention rate that is among the highest nationally,10 the database provides a vehicle for population-based research into a wide range of issues related to health behaviors, risk, and protective factors in the lives of young people.

Study Sample

The study sample included the index group of students who reported having been in classes for learning problems, and a comparison group of students who had never been in any classes for learning problems. Of all respondents, 121,848 (99%) answered the question about attending classes for learning problems; 12,636 male students and 9,091 female students reported that they had been in classes for learning problems at some time. Students who had not been in special education classes were proportionately more likely to be white and in a higher grade than those who had been in special education classes (P<.001). These differences in race and grade were adjusted in the subsequent analyses by selecting the comparison group members to proportionately match the male and female index groups by grade and by race. This was achieved by first stratifying on these 2 variables, and randomly selecting the requisite number of male and female controls. Race information was missing for 189 male and 129 female index cases. These cases were excluded, so that the index and comparison groups each included 12,447 boys and 8,962 girls. Of the combined study sample, 42.8% were in the 6th grade, 35.1% were in the 9th grade, and 22.1% were in the 12th grade. The racial makeup was 81.6% white, 2.7% Asian, 2.2% American Indian, 1.8% African American, 1.6% Hispanic, and 10.1% mixed race or other.

Measures

A history of receiving special education services was assessed with the question: “Have you ever been in any classes for learning problems?” Each of the environmental characteristics examined was measured by a single question, as follows: Family structure: “Which adults do you live with?” (Responses were classified as 1- or 2-parent families or other situations.) Family alcohol and other drug problems: “Has alcohol use by any family member repeatedly caused family, health, job, or legal problems?” “Has drug use by any family member repeatedly caused family, health, job, or legal problems?” Victim of physical abuse: “Has any adult in your household ever hit you so hard or so often that you had marks or were afraid of that person?” Witness of physical abuse: “Has anyone in your family ever hit anyone else in the family so hard or so often that they had marks or were afraid of that person?” Extraraditional sexual abuse: “Has anyone or older person outside the family ever touched you sexually against your wishes or forced you to touch them sexually?” Intradural sexual abuse: “Has any other or stronger member of your family ever touched you sexually or had you touch them sexually?”

Emotional status was assessed by means of a 13-item scale. Six questions assessed the respondent’s mood, level of stress, sadness, hopelessness, nervousness, and satisfaction with personal life during the past month. “Students chose from 5 possible answers, ranging from no problem at all to constant or severe distress. The remaining 7 items explored the respondent’s level of agreement with the following statements: “I usually feel good about myself.” “I am able to do things as well as most other people my age.” “On the whole, I’m satisfied with myself.” “I feel I do not have much to be proud of.” “Sometimes I think that I am no good.” “I feel that I can’t do anything right.” “I feel that my life is not very useful.” Students responded to each item with 1 of 4 choices: “Disagree,” “Mostly disagree,” “Mostly agree,” or “Agree.” This scale demonstrated substantial internal consistency (Cronbach α=0.88 and 0.90 for boys and girls, respectively). Eliminating any of the 13 variables in the scale reduced the α coefficients.

Statistical Analysis

All bivariate and multivariate analyses were conducted separately for boys and girls, and multivariate analyses were also stratified by grade in school. First, bivariate comparisons of the index and comparison groups were performed for each environmental and psychosocial characteristic. The χ² statistic was used to test group differences. For the bivariate analyses, the emotional status scale was dichotomized to lowest quartile vs all others. For the remaining analyses, the emotional status scale was retained as a continuous variable. A correlation matrix using Spearman rank correlation coefficients for correlation among categorical variables and Pearson correlation coefficients for correlation with the emotional status scale showed the degree of intercorrelation among study variables. All of the variables found to be significant in the bivariate analysis were then entered simultaneously into the logistic regressions to estimate the association between each factor and having been in classes for learning problems after adjusting for the other factors. Odds ratios and 95% confidence intervals are reported for each variable. For the multivariate analyses, the emotional status scale was adjusted to range from 1 to 0, where a lower value represents healthier status. Thus, the odds ratio represents the odds of having been in classes for learning problems for those at the highest end of the scale when compared with those at the lowest end of the scale.
Because students receiving special education services are seldom identified in, and sometimes excluded from, surveys of adolescent health behaviors, little is known about health risks and outcomes in this population. Population-based research in the area of special education has focused on follow-up studies of young adults with disabilities who received special education services while attending high school, tracking their employment, postsecondary education and training, living arrangements, social networks, and recreational activities. Two years after leaving high school, young adults with disabilities in Minnesota were more likely to be employed, live independently, and attend postsecondary education and training programs than the national sample of youth with disabilities, with 80% employed, 23% living independently, and 28% pursuing postsecondary education or training. Studies of children referred for evaluation of learning disorders have found associations of learning impairment with child abuse and neglect and depression. The extent to which these and other environmental and psychosocial factors characterize children and adolescents served by special education services is unknown.

The purpose of this study was to compare a nonclinical population of adolescents who reported having been in any classes for learning problems with a comparison group who had never been in special education classes. Emotional status and potential environmental risk factors, including family structure, family substance use problems, family violence, and sexual abuse, were examined. These associations were also examined across sex and age groups. We hypothesized that adolescents who had been in classes for learning problems would report greater emotional distress and more exposure to violence and other environmental stressors than their peers.

### RESULTS

In this statewide survey of 6th, 9th, and 12th grade students, 20.8% of male youth and 14.9% of female youth reported having been in classes for learning problems. Adolescents who reported having received special education services were much more likely to report poor academic performance than were those who had not. For boys, more than 4 times as many index cases as controls indicated a history of having such a hard time learning to read that they could not keep up with their class (37.4% vs 8.0%), and male index cases were 3 times more likely than boys in the comparison group to report below-average grades in school (37.2% vs 12.4%). Female index cases were nearly 6 times more likely than controls to indicate significant difficulties learning to read (33.5% vs 5.6%) and more than 3 times more likely to report below-average school performance (26.4% vs 7.7%). These differences were highly significant for both boys and girls (P < .001) and provide consistent construct validation for the single item measure assessing involvement in special education classes.

There were significant group differences in regard to environmental characteristics for both male and female students (Table 1). A significantly greater proportion of the index group indicated that they did not live with both biological or adoptive parents (43.9% vs 31.8% for boys; 42.4% vs 30.2% for girls). More than 1.5 times as many index boys and girls reported that they had ever been physically abused by an adult in their household, and there were similar group differences for both boys and girls in reports of witnessing other family violence. Male and female index cases were also significantly more likely than those in the comparison groups to report a history of sexual abuse by a nonfamily adult or a family member and to indicate a problem with alcohol or other drugs among family members. Family violence, sexual abuse, and family substance use problems were more frequently reported by female adolescents than male adolescents. Sex differences were most marked for sexual abuse, with more than 3 times as many girls than boys reporting a history of sexual abuse.

Male and female students who ever received special education services reported significantly greater emotional distress than those who had not. Among boys, 25.0% of adolescents who had been in classes for learning problems fell in the lowest quartile for emotional status vs 13.6% of adolescents who had never been in spe-

### Table 1. Differences in Environmental Characteristics Between Adolescents Who Have and Have Not Been in Classes for Learning Problems

<table>
<thead>
<tr>
<th></th>
<th>Male Respondents*</th>
<th>Female Respondents*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Family structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both biological/adoptive parents</td>
<td>6993 (56.2)</td>
<td>8500 (68.3)</td>
</tr>
<tr>
<td>One parent</td>
<td>2883 (23.2)</td>
<td>2111 (17.0)</td>
</tr>
<tr>
<td>Other situations</td>
<td>2571 (20.7)</td>
<td>1836 (14.8)</td>
</tr>
<tr>
<td>Physically abused</td>
<td>1960 (16.1)</td>
<td>1110 (9.1)</td>
</tr>
<tr>
<td>Witnessed abuse</td>
<td>2191 (18.0)</td>
<td>1245 (10.2)</td>
</tr>
<tr>
<td>Sexually abused by nonfamily adult</td>
<td>564 (4.6)</td>
<td>394 (2.5)</td>
</tr>
<tr>
<td>Sexually abused by family member</td>
<td>362 (3.0)</td>
<td>139 (1.1)</td>
</tr>
<tr>
<td>Alcohol problem in family</td>
<td>1243 (10.0)</td>
<td>505 (5.0)</td>
</tr>
<tr>
<td>Other drug problem in family</td>
<td>1177 (9.7)</td>
<td>608 (5.0)</td>
</tr>
</tbody>
</table>

*P < .001 for all comparisons.
Most of the factors found to be significant in the bivariate analyses remained significant after controlling for the other variables in the multivariate analyses. However, after adjusting for other factors, a history of experiencing sexual abuse was not associated with special class placement for learning problems among 6th, 9th, and 12th grade boys, and family substance use problems were not associated with special class placement among 12th grade girls. Although the other variables showed significant associations, the odds ratios were all less than 1.6, except for the emotional status variable. Students with the most emotional distress had 6 to 14 times the odds of having received special education services than students with the lowest emotional distress. Although the confidence intervals overlap, there was a decrease in the strength of the association between emotional status and special class placement with increased grade among both male and female adolescents (odds ratios were 14.08, 8.87, and 6.83 for 6th, 9th, and 12th grade boys, respectively; and 12.16, 7.21, and 6.06 for 6th, 9th, and 12th grade girls, respectively).

In this large nonclinical sample, 18% of students reported having been in classes for learning problems. Compared with grade- and race-matched peers who were never in classes for learning problems, a significantly greater proportion of index boys and girls lived in single-parent and nontraditional households, indicated that a family member had an alcohol or other drug problem, witnessed or experienced physical abuse, and reported a his-

### Table 2. Odds Ratios (ORs) and Confidence Intervals (CIs) for Having Been in Classes for Learning Problems*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>6th Grade</th>
<th></th>
<th>9th Grade</th>
<th></th>
<th>12th Grade</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>CI</td>
<td>OR</td>
<td>CI</td>
<td>OR</td>
<td>CI</td>
</tr>
<tr>
<td>Male respondents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>1.37</td>
<td>1.27-1.48</td>
<td>1.53</td>
<td>1.42-1.65</td>
<td>1.51</td>
<td>1.38-1.66</td>
</tr>
<tr>
<td>Family structure†</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One parent</td>
<td>1.50</td>
<td>1.34-1.68</td>
<td>1.44</td>
<td>1.28-1.62</td>
<td>1.27†</td>
<td>1.09-1.46</td>
</tr>
<tr>
<td>Other situation</td>
<td>1.45</td>
<td>1.30-1.63</td>
<td>1.33</td>
<td>1.17-1.51</td>
<td>1.37</td>
<td>1.17-1.60</td>
</tr>
<tr>
<td>Family violence</td>
<td>1.24</td>
<td>1.10-1.40</td>
<td>1.36</td>
<td>1.20-1.54</td>
<td>1.43</td>
<td>1.22-1.69</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>1.10§</td>
<td>0.86-1.41</td>
<td>1.24§</td>
<td>0.98-1.57</td>
<td>1.20§</td>
<td>0.90-1.61</td>
</tr>
<tr>
<td>Family substance use problems</td>
<td>1.47</td>
<td>1.30-1.66</td>
<td>1.28</td>
<td>1.13-1.45</td>
<td>1.23§</td>
<td>1.06-1.43</td>
</tr>
<tr>
<td>Emotional status</td>
<td>14.08</td>
<td>10.06-19.70</td>
<td>8.89</td>
<td>6.30-12.56</td>
<td>8.63</td>
<td>4.47-10.43</td>
</tr>
<tr>
<td>Female respondents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>1.24</td>
<td>1.14-1.36</td>
<td>1.47</td>
<td>1.34-1.61</td>
<td>1.48</td>
<td>1.33-1.65</td>
</tr>
<tr>
<td>Family structure†</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One parent</td>
<td>1.36</td>
<td>1.19-1.55</td>
<td>1.42</td>
<td>1.24-1.63</td>
<td>1.30†</td>
<td>1.09-1.56</td>
</tr>
<tr>
<td>Other situation</td>
<td>1.45</td>
<td>1.26-1.67</td>
<td>1.47</td>
<td>1.26-1.71</td>
<td>1.26¶</td>
<td>1.04-1.51</td>
</tr>
<tr>
<td>Family violence</td>
<td>1.15¶</td>
<td>1.00-1.32</td>
<td>1.28</td>
<td>1.13-1.45</td>
<td>1.34</td>
<td>1.14-1.57</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>1.35¶</td>
<td>1.12-1.62</td>
<td>1.34</td>
<td>1.16-1.54</td>
<td>1.55</td>
<td>1.32-1.82</td>
</tr>
<tr>
<td>Family substance use problems</td>
<td>1.18¶</td>
<td>1.04-1.35</td>
<td>1.21‡</td>
<td>1.07-1.38</td>
<td>1.08§</td>
<td>0.93-1.26</td>
</tr>
<tr>
<td>Emotional status</td>
<td>12.76</td>
<td>8.78-18.53</td>
<td>7.21</td>
<td>4.98-10.44</td>
<td>6.06</td>
<td>3.80-9.65</td>
</tr>
</tbody>
</table>

* The number of male and female respondents was as follows: 6th grade, 9144 and 6670, respectively; 9th grade, 8068 and 5968, respectively; and 12th grade, 5255 and 3876, respectively. All ORs except those otherwise noted are P<.01.

† The reference for family structure is 2 parents.

§ Not significant.

The emotional status scale was adjusted to range from 1 to 0, where a lower value represents healthier status. The odds ratio represents the odds of having been in classes for learning problems for those at the highest end of the scale when compared with those at the lowest end of the scale.
tory of sexual abuse and poor emotional health. Most of these associations maintained their significance after adjusting for the other factors in the multivariate model. However, after adjusting for other factors, a history of sexual abuse was associated with having been in classes for learning problems among female youth, but not male youth, at all grade levels. The strongest association with having been in special education classes for both male and female students in this study was poor emotional health.

The findings from this study are consistent with other results. Hoffman-Plotkin and Twentyman\textsuperscript{2} reported an average difference of 20 IQ points between preschoolers who experienced abuse and/or neglect and those who did not. Mullins\textsuperscript{13} noted the overrepresentation of abused children in special education classes, as well as the overrepresentation of children with disabilities in the abused population. A study of children of battered women found that 46% had evidence of academic problems, including grade repetition, failing grades, and the need for special education services in school.\textsuperscript{14} Children of alcohol-abusing parents have been found to have significantly lower school performance\textsuperscript{15,16} and more frequent placement in special education classes\textsuperscript{17} than children of non-alcohol-abusing parents. Associations have also been observed between single-parent and stepfamily homes and both lower grade point average and more disruptive behavior in school.\textsuperscript{18} One limitation of the present analysis, however, is that, because of the absence of any measure of familial socioeconomic status, it was not possible to disaggregate the effects of family structure and socioeconomic status. In addition, the study sample was largely white, limiting generalization to adolescents from other ethnic backgrounds.

Several reports have suggested links between learning disabilities and emotional problems in children and adolescents, including depression and low self-esteem.\textsuperscript{19-21} In contrast to our study, Beer and Beer\textsuperscript{22} found no differences in scores on standardized measures of self-esteem and depression between school students receiving special education and those in regular education classes. Their comparisons, however, were based on only 9 students receiving special education, suggesting a sample size with insufficient power to detect true group differences. Because of the large population in the present study, including 6th, 9th, and 12th graders, we were able to examine associations between a history of receiving special education services and environmental stressors or psychosocial factors separately by grade. Interestingly, the association between special class placement and emotional status was the strongest in early adolescence, with a decreasing trend among the older male and female students. It may be that the association weakens as emotional distress becomes more prevalent generally in older adolescents, as shown in a variety of analyses.\textsuperscript{26,27} In addition, the association may be weaker in the older adolescents because, on average, more time is likely to have passed since they were in classes for learning problems. The measure that was used in this report as the outcome variable delineates a history of special class placement for learning problems but does not disclose when, for how long, or for what specific reasons the student received special education services, or whether the student was currently in special education classes. However, the significant association of below-average grades and difficulty learning to read with a history of special class placement for learning problems confirms that this is a population of students who are at risk for poor academic performance. Inclusion of adolescents in regular public schools who were able to complete a questionnaire written at the 5th-grade reading level, and not those who had dropped out or were in alternative schools, may have resulted in the selection of academically higher-functioning adolescents who had received special education services.

Our findings have a number of implications for child health care providers. These recommendations must be tempered by the inability to make causal attributions from this cross-sectional dataset. Children with environmental stressors, including single-parent or nontraditional family structure, family substance use problems, family violence, and sexual abuse, appear to be at higher risk for special class placement for learning problems. These children should have close developmental surveillance, receiving necessary supportive services early. Such interventions should lessen the chances that early vulnerabilities will progress to intellectual impairment, a disability that is more difficult and costly to treat later on. Conversely, clinicians should ask children and adolescents receiving special education services about potential associated environmental stressors, so as to provide appropriate assessment and intervention.

Many have underscored the critical role that emotional status, particularly self-esteem and hopefulness, plays in determining resilience.\textsuperscript{28-30} Self-esteem and hopefulness are essential to children’s health and well-being, impacting their behaviors and accomplishments throughout life. Low self-esteem and emotional distress have been associated with adverse outcomes, including cigarette smoking, alcohol and other drug use, and suicide attempts, among adolescents.\textsuperscript{7,21,31,32} Because the data in this study were collected in a cross-sectional survey, causation between poor emotional health and being in special education classes cannot be established, and we clearly recognize that diminished self-esteem and emotional distress may well be the antecedent or consequence of receiving special education services. In addition, the measure of emotional status used in this study does not allow the distinction between self-esteem and depression. Nevertheless, health care providers should recognize the strong association between poor emotional health and a history of receiving special education services among children and adolescents. Helping parents to promote self-esteem in their children should be a key objective of developmentally oriented anticipatory guidance during child health supervision. Health care providers can offer parents specific recommendations for fostering self-esteem, such as how to encourage rather than pressure their children, to actively listen, to communicate using positive language, to develop responsibility and provide
opportunities for making choices, and to have realistic expectations, clearly defined rules, and logical consequences for their children.11 In addition, the emotional status of children and adolescents in special education classes should be routinely assessed, and interventions to enhance self-esteem and emotional wellbeing should be discussed with parents and teachers. Health care professionals should be familiar with family and child support services to make effective referrals, so that the receipt of special education services can be focused on the development and enhancement of competence in young people. In light of the sheer magnitude of this population of children and youth, it is essential that health care providers be familiar with approaches to anticipatory guidance and service referral that will complement the efforts of educational systems to develop the competence and confidence of young people.

Accepted for publication November 19, 1997.

This study was supported in part by grant MCH-000985, the Adolescent Health Training Program, from the Maternal and Child Health Bureau, Department of Health and Human Services, Washington, DC.

Corresponding author: Iris Wagman Borowsky, MD, PhD, Division of General Pediatrics and Adolescent Health, Box 721, Fairview-University Medical Center, 420 Delaware St SE, Minneapolis, MN 55455.

REFERENCES
