Sociodemographic and Condition-Related Characteristics Associated With Conduct Problems in School-aged Children With Chronic Health Conditions

Ellen Johnson Silver, PhD; Ruth E. K. Stein, MD; Laurie J. Bauman, PhD

**Objective:** To examine whether sociodemographic and condition-related characteristics are associated with conduct problems in children with chronic health conditions.

**Design:** Cross-sectional survey.

**Participants:** Mothers of children 5 to 8 years old with diverse chronic health conditions who received care at 2 large urban medical centers.

**Measures:** Mothers responded to a face-to-face structured interview that included the Eyberg Child Behavior Inventory, the Psychiatric Symptom Index, and questions about sociodemographic and health condition–related characteristics.

**Results:** Of the 356 children assessed, 138 (38.8%) had conduct problems as defined by criteria of the Eyberg Child Behavior Inventory. In logistic regression analyses, conduct problems were associated with younger child age, mother having a husband or partner unrelated to her child, poorer perceived prognosis, child having a learning disability, and maternal self-report of high emotional distress on the Psychiatric Symptom Index. Conduct problems were not related to child sex, maternal ethnicity or education, family receiving welfare, or a wide range of condition-related factors, including age at diagnosis, visibility to others, need to watch for sudden changes, presence of mobility or sensory-communication problems, using medication or equipment, annual hospitalizations, or physician visits.

**Conclusions:** Conduct problems in children with chronic health conditions appear to be associated more closely with their sociodemographic and family characteristics than with condition-related risk factors. Additional research remains to be done on the ways that maternal adjustment, diagnosis-specific condition characteristics, and other risk factors influence children’s behavior.
SUBJECTS AND METHODS

RECRUITMENT PROCEDURES

We recruited 365 mother-child pairs as part of a longitudinal investigation that evaluated the psychological effects of a community-based support intervention on school-aged children with chronic health conditions and their mothers.13 All of the study data used in the present analyses were obtained from face-to-face interviews with mothers at baseline, before their randomization into the experimental and control groups. Mothers were given the option of being interviewed in English or Spanish, and they were paid $20 for the 1-hour interview. The study protocol was approved by the institutional review board, and written informed consent was obtained from all participants.

The study families were recruited from 2 large urban medical centers, both serving predominantly low-income, minority populations. Both inpatient and outpatient records from the previous 2 years were used to identify children 5 to 8 years of age who had chronic physical health conditions. For this study, we used the definition by Pless and Douglas,14 which specifies a chronic health condition to be one that either has lasted or is expected to last for at least 3 months or more or has required the child to be hospitalized for at least 30 days in the previous year. Because of intervention requirements, several eligibility criteria were applied. Children had to live in the Bronx or lower Westchester County, New York, with mothers who spoke at least conversational English. Other exclusions were severe to moderate mental retardation in the child or having a learning disability; and numbers of hospitalizations and physician visits the child had in the previous 12 months.

Maternal Emotional Distress

We assessed the mother's emotional distress by means of the total symptom score on the 29-item Psychiatric Symptom Inventory (PSI).15 The PSI is a multidimensional self-report symptom inventory that was developed on a community sample of 2299 men and women. Internal consistency reliability for the scale is high, and its concurrent validity with other criteria indicating emotional distress has been well established. The PSI items are also consistent with established diagnostic criteria used by clinicians.16 Although the PSI is not intended to define psychiatric caseness, scores at or above 20 represent the top 15% of scores in the normative sample and therefore are considered to represent “high” symptom levels.15 We used this cutoff to indicate high emotional distress in our sample of mothers.

Children's Conduct Problems

We defined conduct problems in children on the basis of the mothers' responses to the Eyberg Child Behavior Inventory (ECBI).17,18 The ECBI is a 36-item checklist of children's conduct problems that is relatively infrequent but troublesome to their parents, and that parents of these children may either be overly critical or lacking in behavioral management skills.10 Finally, 16 children (4.5%) had high intensity scores only. The scale's authors suggest that parents of children displaying this type of score discrepancy may be more toler-
behavior problems, including aggression, noncompliance, rule breaking, and lying. The scale has good internal reliability and validity. Its scores relate well to direct observational measures and also correlate highly with other well-established parent rating scales. Individual ECBI items are rated according to frequency of occurrence and scored from 1 (never) to 7 (always). A total intensity score is produced by summing the frequency of occurrence of the 36 problem behaviors (range, 36-252). Respondents are also asked to indicate whether each listed behavior is a problem for them (yes or no). The problem score is the tally of the number of behaviors that are rated as a problem. According to the scale’s authors, the problem and intensity subscale scores measure highly related but independent dimensions. They also suggest that intensity scores of 127 or problem scores of 11 provide appropriate cutoffs in using this measure to screen for children in need of treatment. For this study, therefore, children were considered to have conduct problems if they scored above the screening cutoff score on either ECBI subscale; conversely, they did not have conduct problems if they were below the cutoffs on both subscales.

SAMPLE DESCRIPTION

Demographic Characteristics

The children’s mean age at study enrollment was 7.1 years (SD, 1.2 years), and they were almost evenly divided between boys (33.9%) and girls (46.1%). In terms of family composition, fewer than half (41.9%) of the families had both biological parents of the child living in the household. In more than one third of families (37.6%), there was no adult other than the mother in the household. 5.9% of mothers had a husband or live-in partner who was not the child’s father, and 14.6% of mothers and children lived with 1 or more adult relatives. Among mothers, the largest ethnic group was Hispanic (44.5%); among the others, 36.3% were black and 14.2% were white, non-Hispanic, and 5.1% of mothers reported that they were of mixed or other ethnic or racial backgrounds. Although 22.3% of mothers in the sample did not finish high school, 35.8% said they had graduated from high school, 33.0% attended some college, and 9.0% were college graduates. Almost half of the enrolled families (48.5%) received public assistance (welfare).

Conditions and Related Characteristics

A wide range of chronic conditions was reported among children in the study. The most common diagnoses were asthma (35.1%), sickle cell anemia (7.6%), congenital heart disease or other cardiac disorders (8.4%), epilepsy (8.1%), cleft lip and/or palate (5.3%), and various forms of cancer (3.1%). The mean age at diagnosis was 23.1 months (SD, 26.5 months), with 38.3% of the children having been diagnosed at birth or within the first year, 30.8% between the first and second years, and 30.2% after 2 years of age. Thus, the average time since diagnosis was about 5 years (SD, 2.2 years). The majority of children (62.1%) did not experience a hospitalization in the 12 months before the survey. 30.9% had been hospitalized once or twice, and the remaining 7.0% had had from 3 to 12 hospitalizations in the same period. In terms of physician visits during the year, 12.6% had 0 to 2 visits, 57.0% had 3 to 10 visits, 15.7% had 11 to 20 visits, and 14.6% had more than 20 visits; although the mean was 11.5 (SD, 13.9), half the children in the sample saw a physician 6 times or less (median, 6.0).

Mothers rated the children’s health as excellent (14.0%), very good (20.8%), good (32.3%), fair (23.9%), or poor (9.0%). Although the majority of mothers said that the child would get better (59.3%), others said the child would stay the same (19.4%) or get worse (4.2%) or did not know the prognosis (17.1%). Some mothers reported that the child’s condition was visible to other people either all of the time or in some special situations (59.0%), or that they needed to watch for sudden changes in the condition (71.2%). In the sample, 57.6% used 1 or more prescribed medications on a regular basis, 28.7% used any type of health-related equipment, 12.1% had serious mobility problems, 35.9% had sensory-communication problems, and 17.5% had learning disabilities.

DATA ANALYSIS

We used a noncategorical approach and combined all children with chronic conditions into 1 group for the present analyses. Bivariate analyses examining the relationships of the individual sociodemographic and condition-related factors to presence of conduct problems (yes or no) on the ECBI were conducted by means of cross-tabulation and χ² analyses. To identify the sociodemographic and condition-related variables that were uniquely related to the presence of a conduct problem, we entered all of the independent variables together into a logistic regression analysis. All analyses were conducted with SPSS/PC+ version 5.0.

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The only condition-related factors significantly associated with conduct problems in bivariate analyses were maternal-rated prognosis and health status. **Table 2** shows that as condition prognosis and health status rating worsened, the likelihood that a child’s behavior would meet the criteria for conduct problems increased. Children with learning disabilities also were more likely to have conduct problems. However, no significant bivariate relationships were found between presence of conduct problems and any other condition-related characteristics that were assessed, including age at diagnosis, visibility to others, need for mother to watch for sudden changes in the child’s condition, presence of mobility or sensory-communication problems, and use of medication or equipment. Conduct problems also were not related to annual hospitalizations and physician visits, the 2 health care utilization measures we used. Moreover, no condition-related characteristic distinguished among groups of children with different patterns of ECBI scores (ie, high intensity scores and low problem scores, high problem scores but low intensity scores, or high on both).

Finally, we simultaneously entered all of the independent variables into a logistic regression analysis, with presence of conduct problems as the dependent variable. On the basis of the significant categories found in the bivariate analyses, we recoded family structure, maternal ethnicity, and educational level to create yes-no dummy variables for this analysis. **Table 3** gives the partial correlations and odds ratios for the variables that were significantly related to conduct problems: younger child age, mother living with a husband or partner unrelated to the child, child having a learning disability, mother having self-report of high emotional distress, and poorer perceived prognosis. With effects of other variables controlled through regression analysis, several variables (ie, health status, maternal ethnicity, and educational level) that had been significant in the bivariate analyses were no longer associated with presence of conduct problems.
Mother-reported behaviors meeting the threshold for conduct problems occurred fairly frequently in this inner-city sample of school-aged children with chronic health conditions. We found higher rates of conduct problems in several previously identified risk groups among children with chronic conditions, including those who were younger, lived with mother and her unrelated spouse or partner, or had learning problems. High maternal emotional distress also was associated with a greater likelihood of conduct problems in these children. Although a wide range of health condition–related characteristics also were explored in this study, most of them were determined to be unrelated to the presence of conduct problems. The only condition-related factor significantly associated with conduct problems was poorer perceived prognosis, as reported by the mother. We can only speculate about the nature of this relationship. It is possible that children in declining health act out more often or that mothers who perceive their children's prognoses to be poor have greater difficulty setting limits on their behavior. On the other hand, increased misbehavior could be one of the ways that a mother detects that her child's health is getting worse. Nonetheless, our findings suggest that conduct problems in children with chronic health conditions are associated more closely with their sociodemographic and family characteristics than with most condition-related risk factors. Other investigators looking at correlates of psychological adjustment in children with physical disorders have arrived at a similar conclusion.\footnote{We noted, in particular, that poorer maternal psychological functioning was related to an increased report of child conduct problems, which confirms a well-documented association between maternal and child adjustment found in many other studies. In general, however, previous research relating maternal distress to behavior problems in their children has not been conclusive in specifying the direction of this effect. It is possible that poor psychological adjustment in mothers is a response to their children's behavioral problems, that the children's behavior reflects high maternal distress, or that both the mother and child are reacting to a common stressor, which could be the child's health condition or a range of other social and environmental factors. The relationship of maternal and child adjustment remains one that is very difficult to disentangle, especially when cross-sectional data are used. As noted, we cannot determine the degree to which the mother's emotional distress affected the ways she reported on the child's behavior or other characteristics of the child's chronic condition, such as prognosis, health status, and utilization of health care. Because all of the study data we analyzed were obtained from the mother, we also cannot rule out the potential contribution of shared method variance to the relationships we found. Use of physician ratings for variables such as prognosis and health status also might have yielded different results. Clearly, future research could be strengthened considerably by the use of independent and/or multiple data sources for these variables.}

Other possible limitations need to be considered in evaluating the findings of this study. Despite the use of a large sample representing diverse chronic health conditions in children, the generalizability of these findings to samples with a broader range of sociodemographic characteristics needs to be determined. In particular, lower socioeconomic status is frequently associated with behavior problems in children, yet welfare status was not a significant predictor of conduct problems in this study. This is probably because of the constricted range of income levels represented in our sample. Moreover, the use of population-based, rather than single-center, samples of children with chronic health conditions in future studies would minimize the possibility of site-specific effects.\footnote{In addition, we focused on condition-related characteristics that cross diagnostic boundaries (eg, visibility, age at onset, prognosis). However, other investigators\footnote{We have suggested a diagnosis-specific, rather than a generic or noncategorical, approach to studying the condition-related factors that may influence children's behavior and adaptation, and this technique also might be explored further. Finally, contrasting these findings with additional data on the roles that similar individual and environmental factors play in the adjustment of demographically comparable children without chronic conditions might be useful.} have suggested a diagnosis-specific, rather than a generic or noncategorical, approach to studying the condition-related factors that may influence children's behavior and adaptation, and this technique also might be explored further. Finally, contrasting these findings with additional data on the roles that similar individual and environmental factors play in the adjustment of demographically comparable children without chronic conditions might be useful.}

It is clear that further investigation is warranted both on the relationship between maternal and child adjustment and on other risk and protective factors that influence the behavior of children with chronic health conditions. We have provided further confirmation that the behavior of children with chronic conditions is influenced by child and family variables beyond those that characterize health status. These other characteristics should not be neglected in research on the psychosocial effects of chronic childhood illness. Moreover, it has been shown that some demographic characteristics, particularly family structure,\footnote{5,26 may alter the relationship between physical and mental health in children. Thus, further research in this area needs to move beyond the investigation of direct effects. We conclude, as did Lavigne and Faier-Routman,\footnote{That researchers must develop and test models that examine interactions among the various risk and protective factors and thereby look for possible moderating effects on children's adjustment as well.} that researchers must develop and test models that examine interactions among the various risk and protective factors and thereby look for possible moderating effects on children's adjustment as well.} may alter the relationship between physical and mental health in children. Thus, further research in this area needs to move beyond the investigation of direct effects. We conclude, as did Lavigne and Faier-Routman,\footnote{That researchers must develop and test models that examine interactions among the various risk and protective factors and thereby look for possible moderating effects on children's adjustment as well.} that researchers must develop and test models that examine interactions among the various risk and protective factors and thereby look for possible moderating effects on children's adjustment as well.

### Table 3. Results of Logistic Regression: Sociodemographic and Condition-Related Characteristics Significantly Related to Presence of Conduct Problems in Children With Chronic Health Conditions\footnote{Child age range was 5 to 8 years. High maternal distress was indicated by Psychiatric Symptom Index\textsuperscript{3} total score of } 

<table>
<thead>
<tr>
<th>Partial Correlation</th>
<th>Odds Ratio</th>
<th>P</th>
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<tbody>
<tr>
<td>Child age in years</td>
<td>-0.07</td>
<td>0.79</td>
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<tr>
<td>Mother has husband or live-in partner unrelated to child</td>
<td>0.08</td>
<td>3.13</td>
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<tr>
<td>Poorer perceived prognosis</td>
<td>0.09</td>
<td>1.71</td>
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<tr>
<td>Child has learning disability</td>
<td>0.11</td>
<td>2.76</td>
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<tr>
<td>High maternal distress</td>
<td>0.15</td>
<td>2.87</td>
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\* N = 356.
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Reprints: Ellen Johnson Silver, PhD, Albert Einstein College of Medicine, Jack & Pearl Resnick Campus, 1300 Morris Park Ave, NR 7S-15, Bronx, NY 10461.

REFERENCES