Factors Associated with Mental Health, General Health, and School-Based Service Use for Child Psychopathology

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ABSTRACT

Objectives. This study was designed to identify factors associated with service use for child psychopathology in three settings: mental health, general health, and school.

Methods. Subjects were 2519 children, 6 to 11 years of age, assessed in two cross-sectional Connecticut surveys in the late 1980s. Three groups of variables (sociodemographics, child's illness profile, and parental attitudes) were examined through multivariate logistic regression.

Results. Most sociodemographics showed moderate associations with all settings, although some previously reported effects (e.g., birth order, sibship size) were not observed. Of the illness profile measures, only Child Behavior Checklist total scores predicted use in the final model (odds ratio [OR] = 1.6, 95% confidence interval [CI] = 1.1, 2.3). Health problems were associated with increased use in all settings (OR = 1.5, 95% CI = 1.3, 1.9), while academic problems were associated only with increased school service use (OR = 5.2, 95% CI = 3.9, 7.0). Parental belief that the child needed help was most strongly associated with service use (common OR for all settings = 5.3, 95% CI = 4.1, 6.8).

Conclusions. Sociodemographics, parental attitudes, and children's illness profiles independently influence service use for psychopathology in school-aged children. (*Am J Public Health.* 1997;87:1440–1448)

Introduction

In the last 2 decades, accumulating evidence has suggested that while population prevalence rates of child psychopathology are substantial, ranging from 12% to 22%,[1,2] only a small portion of children with emotional and behavioral problems are treated in traditional mental health settings. A 1980 review by Gould et al. reported that fewer than 1 in 10 children with psychiatric disorders are seen by mental health providers.[3] More recently, Burns reported that only 2% of adolescents had mental health service contacts, a rate considerably lower than the estimated population prevalence of psychopathology.[4] Several population-based studies have identified that most service contacts take place outside the mental health system in settings such as schools, pediatric primary care, juvenile justice agencies, substance abuse treatment centers, and child protective services.[5–7]

Identifying factors that are associated with service use for child psychopathology is important both for service planning and for research. For service planning, this information can be useful in designing placements that are compatible with service preferences of different cultural groups and in identifying underserved groups needing outreach or education. These studies may also uncover characteristics other than the child's psychopathology that predispose families to use particular services. For research purposes, the information can help pinpoint sources of bias in studies using samples from treatment settings.

Prior research in this area is sparse and contradictory. Sociodemographic factors reported to be associated with service use include the child's age,[8–14] gender,[9–13,15–18] birth order,[12,14] size of sibship,[12,14,19,20] minority status,[9,11–13,16,20–22] socioeconomic status,[8,10–13,21,23] parental education,[12,21] marital status,[11,18–20,22–24] and rural–urban residence.[8] The nature of the child's illness also determines the likelihood of receiving services and the selection of service settings. Disruptive behaviors, such as delinquency and aggression, are treated more often than emotional problems such as anxiety.[5,10,15,16,23,25] Impaired role functioning and illness severity have been found to predict service use independently of symptom pattern or diagnosis.[15,21] Coexisting health and academic problems have been associated with increased use of health and school-based services, respectively.[5,10]

One class of factors that has been neglected by child mental health researchers concerns attitudes influencing help seeking. Medical sociology has delineated a complex process by which attitudinal factors such as psychological orientation, belief in the efficacy of professional treatment, and readiness to seek treatment influence the decision to seek help and the selection of services.[26,27] With a few notable exceptions, such as parental psychopathology,[15,19,24,28] stress,[15,19] and worries or perceived concerns about the child's behavior,[15,24,29,30] these dispositional factors have not been formally studied for child populations.

Methodological limitations of prior studies do not permit broad and generalizable conclusions to be drawn about any individual factor. Most studies have exam-

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ined a small number of variables, usually without simultaneous adjustment for other factors or psychopathology and typically for only a single mental health center. In this study, we focused on the use of three types of services for emotional and behavioral problems among children 6 to 11 years old: mental health, general health, and school. We investigated characteristics potentially associated with use of these three settings, including sociodemographic, illness profile, and parental attitudinal factors. We used multivariate logistic regression to analyze data for all three service settings simultaneously in an effort to identify factors that are commonly associated with use of all settings, as well as factors that are selectively associated with use of particular settings.

Methods

Study Sample

Data were pooled from two cross-sectional, community-based surveys, the New Haven Child Survey and the Eastern Connecticut Child Survey, that employed comparable survey procedures. The methodology of these surveys has been described in detail elsewhere.[7,31] Briefly, the New Haven Child Survey assessed the mental health and service use of children 6 to 11 years of age in a stratified, proportional random sample (n = 822) from New Haven, Conn, in 1986/87. The Eastern Connecticut Child Survey gathered comparable information in 1988/89 for a stratified two-stage cluster sample of 1697 children 6 to 11 years of age residing in three nonmetropolitan eastern Connecticut counties. Both population-based samples were drawn from classroom enrollment lists of public, private, and institutional schools serving the target areas. Response rates among all eligible subjects with valid address/telephone information were 70% for the New Haven Child Survey and 72% for the Eastern Connecticut Child Survey. The proportion of invalid addresses/telephone listings was higher in the inner-city New Haven sample (21%) than in the nonmetropolitan eastern Connecticut sample (1%). Comparison with the 1980 US census indicated that both samples were representative of the sex, age, and racial/ethnic distributions of their respective target populations.[7,31]

Measures

The two surveys used comparable questionnaires designed to be self-administered by parents. Surveys were distributed through schools with follow-up by mail, telephone, and home visits. Informed consent was described in cover letters accompanying the questionnaires. Wording of the items used in our service use analyses was identical in the two surveys.

Demographics. A list of sociodemographic characteristics possibly associated with service use was assembled after a review of the mental health services literature. Child characteristics included age, gender, race/ethnicity, religion, and birth order. Maternal demographics included education, age at child's birth, status as a single-parent-household head, and employment outside the home. Household characteristics were social class, rural–urban residence, government-subsidized housing, family size, and recent family stress. Social class was measured by the Hollingshead Four-Factor Index of Social Position (A. B. Hollingshead, unpublished manuscript, Yale University, Department of Sociology, 1975), a five-level stratification based on the education and occupation of each employed parent. Family stressors included serious illness or death of a family member, parental divorce or separation (considered or actual), loss of home, lack of funds for basic food or clothing, unemployment of the main breadwinner, crime resulting in property loss, pet death, and school change.

Child's illness profile. Childhood psychopathology was assessed with three scales from the Child Behavior Checklist[32]: the total score, an index of overall disturbance; the Internalizing scale, measuring withdrawn, anxious–depressed, and somatic symptoms; and the Externalizing scale, assessing delinquent and aggressive behaviors. Child Behavior Checklist items employed a 1-year time frame, and scales were dichotomized at the 1991 published normal (vs borderline/clinical) threshold (T score $\geq$60; 83 to 100 percentiles).[32] In the Child Behavior Checklist normative samples, these cut points predicted mental health and special educational referrals, with specificities ranging from .82 to .83 and sensitivities ranging from .60 to .68 for the three scales. Test–retest reliability intraclass correlation coefficients for these scales ranged from .89 to .93 for a 7-day interval.[32]

Behavioral impairment was measured in a single item asking whether any problem noted on the checklist kept the child from doing things done by other children of the same age. The item was recoded to exclude school, speech, or physical health problems.

A physical health problem was considered present if the parent reported any of the following for the child: fair or poor physical health, presence of a chronic condition (using a checklist derived from the US Health and Nutrition Surveys[33]), or limitation in activity by a current health problem. An academic problem was coded as present if the parent reported having been informed by a school or health professional that the child should repeat a grade or was academically immature, learning disabled, a slow learner, or mentally retarded.

Parental attitudinal variables. Maternal distress was measured by summing two 4-point items indicating stressfulness of taking care of the home/children and satisfaction with family life. Problem recognition was assessed with a single item asking parents whether their child needed special help or treatment for a problem noted on the Child Behavior Checklist; the item was recoded to exclude academic, speech, or physical health problems. Provider preference was coded from a checklist on which parents indicated whom they would consider the best care provider if their child had a serious psychological or behavioral problem. Other single-item measures were belief in efficacy of professional treatment for children's psychological or behavior problems, likelihood of seeking help from the preferred provider, and perceived attitudes of family and friends about bringing the child to care.

Service setting use. Service use, defined as a parental report that the child had ever seen a provider or been in a special program or hospital for a problem noted on the Child Behavior Checklist, was based on a standardized checklist covering a wide range of services. No confirmation was obtained of whether a service was actually delivered. The primary reason for each contact was also noted; visits made solely for academic, speech, or physical health problems were not counted. Only services received in mental health, general health, or school settings were considered in the present report. The component services for these three service settings are listed in Table 1.

Analysis

The survey data were weighted by the inverse of sampling probabilities and response rates. The amount of missing data was negligible (less than 3% for individual variables in the analysis), and

TABLE 1—Parental Reports of Service Use for Problems Noted on the Child Behavior Checklist: Children 6 to 11 Years Old (n = 2519), Connecticut, 1986 through 1989

Setting/Service	Unweighted No.	Weighted %[a]
Mental health	172	7.5
Private practitioner	105	4.5
Child guidance clinic	54	2.2
Therapeutic nursery	17	0.9
Hospital inpatient or crisis treatment	11	0.5
Residential care	3	0.1
General health	216	8.4
Pediatrician	152	5.7
Psychologist, psychiatrist, or social worker in health plan or clinic	78	3.3
School	469	19.1
School psychologist or social worker	256	10.6
Special education	308	12.4
Joint classification		
Mental health only	64	3.1
General health only	88	3.2
School only	315	12.8
Mental health + general health	23	0.9
Mental health + school	49	2.0
General health + school	69	2.8
All	36	1.5

Note. Contacts made solely for educational, speech, or physical health problems were excluded.
[a]Sums of proportions of use of component services within a setting may exceed the total proportion for the setting because of multiple use of component services.

missing values were replaced by hot-deck imputation.[34] Polytomous and continuous independent variables were also investigated as dichotomous variables (computed from a median split) in preliminary analyses. Both approaches yielded comparable results, and, for ease of interpretation, the final models presented in this paper mainly involve dichotomous classifications.

In this study, service use in each setting represented a separate outcome. Thus, there were three outcomes per child that were neither mutually exclusive nor independent. We adopted a multivariate logistic regression approach to analyze these data. First, we formed a data set in which every child had three records corresponding to the three service settings; as a result, this data set included 7557 observations (i.e., three times the number of subjects [n = 2519]). The outcome was service use (yes/no), and a covariate indicated the service location (i.e., mental health for the first record, general health for the second, and school for the third). The remaining covariates were the same for all three records of a particular child. This data set was then analyzed via the standard logistic model, illustrated here with only a single covariate, child's gender:

$$\text{Logit}(p) = \beta_0 + \beta_1 \times GH + \beta_2 \times SC + \beta_3 \times SEX + \beta_4 \times (GH \times SEX) + \beta_5 \times (SC \times SEX),$$

where p is the probability of service use; GH and SC are dummy variables for general health and school-based settings, respectively (mental health is the reference setting); and SEX is the child's gender (0 = girl, 1 = boy).

In this model, the odds ratios for boys vs girls are $\exp(\beta_3)$ for use of mental health services, $\exp(\beta_3 + \beta_4)$ for general health, and $\exp(\beta_1 + \beta_5)$ for school. Comparisons of these odds ratios are straightforward via the usual method of assessing interactions. If the interaction terms are significant, then the effect of gender on service use differs across settings; if not, they are dropped and a common effect of gender is estimated across settings.

The three observations on the child's service use are not independent. In this case, then, ordinary logistic regression yields valid estimates for the coefficients but incorrect estimated standard errors. To account for the correlated observations, we used a robust variance estimate based on a resampling (jackknife) approach.[35] This variance estimate has the additional advantage of accounting for the clustering of children by classroom in the New Haven Child Survey and Eastern Connecticut Child Survey samples. We also incorporated the sampling weights in our analyses, which were performed in Stata (Huber logistic regression).[36]

To reduce the number of sociodemographic variables in the multivariate Huber logistic regression models, we ran preliminary logistic regressions separately for each setting; variables that were unrelated to use of any setting were eliminated from further analyses. We then conducted the multivariate analyses. In this paper, we present results from three models, each building on the previous one by expanding the set of independent variables included.

Model 1 included sociodemographic variables only. It was limited to information typically available from census or survey data used in determining whether the population in treatment is representative of the source population. Model 2 included all model 1 variables along with the child's illness profile measures. It assessed whether sociodemographic groups were underserved or overserved, controlling for levels of child symptomatology. It also determined which aspects of the illness profile influence use of the settings under study. Model 3 included parental attitudinal variables in addition to sociodemographics and illness profile measures. It simultaneously assessed the independent effects of all three types of factors.

Results

Table 1 shows the proportions of parents reporting service use for the three settings (mental health, general health, and school) and their component services. Other community services assessed in the parent questionnaires, such as child welfare, legal, and religious services, were infrequently reported (accounting for a combined 4.5% of service contacts) and were not considered in these analyses.

Table 2 presents the univariable results (i.e., frequencies and proportions of service use) for each sociodemographic factor studied. Among the 14 sociodemographics examined, 6 were unrelated to use in any setting: child's birth order, mother's age at child's birth, maternal

employment, rural–urban residence, government-subsidized housing, and number of children in the home. These variables were omitted from further analyses. Social class was also not significantly associated with service use but was retained because of its confounding effect on other variables.

The univariable results for the illness profile and attitudinal variables are not presented here but are available on request. Briefly, in univariable analyses, all illness profile variables were significantly associated with increased use of all settings, as were maternal distress and perceived service need. Of the remaining attitudinal variables, two (propensity to seek care and provider preferences) were related to use of mental health services and use of one other setting (general health and school services, respectively), while belief in treatment efficacy and approval by family and friends were not significant. All illness profile and attitudinal variables were retained for the multivariate modeling.

Tables 3 and 4 present the estimated odds ratios (ORs) and 95% confidence intervals for the three multivariate Huber logistic models of our main analysis. Table 3 lists the variables that had an estimated effect common for all three settings (i.e., their interactions with service setting were not statistically significant at the .05 level). When effects differed by setting (i.e., interactions between predictor variables and settings were significant at the .05 level), separate effects were estimated for each setting; these results are shown in Table 4.

In model 1, which included only the eight sociodemographic characteristics, five were associated with service use in all three settings. Small to moderate increases in service use (odds ratios smaller than 2.0) were observed for older children, boys, and children from homes headed by a single mother. Odds ratios indicative of lower service use were observed for Black and Hispanic children and for Catholics. These five sociodemographics remained significantly associated with service use even when illness profile and attitudinal variables were controlled in models 2 and 3, respectively, but changes in effect size (typically attenuation toward the null) were observed. Adjustment for illness profile variables substantially diminished the effect for child's gender, while further adjustment for attitudinal variables moderated the effects of religion and single-parent household.

TABLE 2—Univariable Analyses for Sociodemographic Factors: Unweighted Frequencies and Weighted Proportions of Service Use for Problems Noted on the Child Behavior Checklist: Children 6 to 11 Years Old, Connecticut, 1986 through 1989

Sociodemographic Characteristic	No.	Mental Health Service Use, Weighted %	General Health Service Use, Weighted %	School Service Use, Weighted %
Total sample	2519	7.5	8.4	19.1
Child				
Age, y				
6–8	1325	5.9	7.8	15.3
9–11	1194	9.2*	9.1	23.3***
Gender				
Female	1300	6.6	6.0	15.0
Male	1219	8.4	11.1***	23.6***
Race/ethnicity				
White and other	1840	7.9	8.5	19.4
Black	502	4.5	7.8	17.4
Latino	177	7.5	8.5	18.5
Religion				
Non-Catholic (72% Protestant)	1468	9.2	9.6	20.5
Catholic	1051	5.3**	6.9	17.4
Birth order				
Only child	250	10.1	8.4	23.6
First child	868	7.2	8.3	16.7
Middle child	515	8.1	8.2	20.0
Youngest child	886	6.7	8.7	19.8
Maternal				
Education				
High school diploma	2126	7.5	8.2	17.9
No high school diploma	393	7.2	9.8	27.0**
Age at child's birth, y				
≥18	2348	7.4	8.3	18.8
<18	171	7.9	10.4	23.9
Household head (parenting) status				
Father figure present	1997	6.2	7.6	18.1
No father figure present	522	13.8**	12.6*	24.4*
Employment status				
Employed outside home	1425	7.6	9.0	19.7
Other	1094	7.3	7.7	18.3
Family/community				
Social class[a]				
High (I, II)	1242	7.0	8.2	17.1
Middle (III, IV)	959	7.5	8.1	20.8
Low (V)	318	9.6	10.8	23.2*
Area of residence				
Large or small city	1213	6.5	8.8	17.6
Suburban fringe/rural township	1306	8.0	8.2	19.9
Housing				
Privately owned or rented	2178	7.1	8.2	18.9
Subsidized by government	341	10.4	9.7	20.9
No. children <18 y old at home				
1	350	9.2	9.1	23.6
2–3	1775	6.6	8.7	18.4
4+	394	9.8	6.6	18.1
No. stresses in past year				
None	910	3.3	6.2	14.6
1 or more	1609	9.9***	9.7**	21.7***

Note. Contacts made solely for educational, speech, or physical health problems were excluded. Weights are the inverses of the sampling probabilities multiplied by the response rates. *P* values refer to differences in proportions of service use across categories of the predictor for each service setting; they were computed from design-based F tests of proportionality for each variable cross-classified by service setting.

[a]Roman numerals refer to the Hollingshead social strata.

*$P < .05$; **$P < .01$; ***$P < .001$.

TABLE 3—Multivariate Huber Logistic Regression Results for Factors Associated with Service Use in All Settings (Common Effects): Children 6 to 11 Years Old, Connecticut, 1986 through 1989

	Odds Ratio (95% Confidence Interval)		
	Model 1	Model 2	Model 3
Child's age:			
9–11 years	1.56 (1.26, 1.93)	1.47 (1.17, 1.83)	1.43 (1.15, 1.77)
Child's gender:			
Male	1.73 (1.39, 2.15)	1.31 (1.05, 1.63)	1.28 (1.04, 1.59)
Child's race/ethnicity			
Black	0.46 (0.31, 0.67)	0.39 (0.27, 0.58)	0.46 (0.31, 0.67)
Hispanic	0.64 (0.40, 1.01)	0.46 (0.28, 0.76)	0.47 (0.28, 0.78)
Single-mother household	1.94 (1.44, 2.62)	1.83 (1.35, 2.47)	1.38 (1.04, 1.85)
Catholic	0.68 (0.54, 0.85)	0.70 (0.55, 0.88)	0.77 (0.61, 0.97)
Social class			
Middle	1.14 (0.90, 1.45)	0.91 (0.71, 1.16)	0.92 (0.73, 1.16)
Low	1.16 (0.75, 1.80)	0.90 (0.60, 1.35)	1.10 (0.75, 1.62)
Borderline/clinical CBCL total score	... ...	2.12 (1.48, 3.02)	1.59 (1.12, 2.26)
Borderline/clinical CBCL internalizing score	... ...	1.54 (1.14, 2.06)	1.28 (0.95, 1.73)
Borderline/clinical CBCL externalizing score	... ...	1.16 (0.85, 1.60)	0.90 (0.67, 1.21)
Impairment	... ...	2.24 (1.31, 3.83)	1.33 (0.81, 2.17)
Health problem present	... ...	1.53 (1.23, 1.89)	1.54 (1.25, 1.91)
Maternal distress	... ...	... ...	1.14 (0.87, 1.48)
Child needs services	... ...	... ...	5.25 (4.09, 6.75)
Strong belief in services	... ...	... ...	1.20 (0.98, 1.47)
Very likely to seek services	... ...	... ...	1.11 (0.83, 1.47)
Strong approval by family and friends	... ...	... ...	0.98 (0.76, 1.25)

Note. CBCL = Child Behavior Checklist. Contacts made solely for educational, speech, or physical health problems were excluded. *P* values for homogeneity of effects across settings were greater than .05. Model 1 included sociodemographics only. Model 2 included sociodemographics and illness profile. Model 3 included sociodemographics, illness profile, and parental attitudes.

The influence of maternal education and family stress on service use varied by setting and was affected by adjustment for other covariates (Table 4). In model 1, a significant interaction ($P < .05$) between maternal education and service setting indicated higher school service use among children whose mothers had not graduated from high school than among children whose mothers were high school graduates. After introduction of illness profile variables in model 2, the effect of maternal education disappeared. In model 1, family stress was associated with significant increases in use of all three settings and a significantly stronger effect for mental health services (OR = 3.12). In models 2 and 3, family stress was associated only with elevated mental health service use.

As with sociodemographic characteristics, most illness profile variables showed a common association with all settings (Table 3). In model 2, three of the four child psychopathology measures (Child Behavior Checklist total score, Child Behavior Checklist Internalizing scale score, and impairment) were associated with moderately increased use of all settings (odds ratios ranging from 1.5 to 2.2). After control for attitudinal variables in model 3, only Child Behavior Checklist total score remained significantly associated with service use. Coexisting conditions showed significant associations with service use in models 2 and 3. Health problems were associated with a moderate increase in overall use, while academic problems showed a strong association with school services.

The factor showing the strongest association with service use in this study was the parental attitudinal measure of perceived service need. Service use increased more than fivefold across all settings when a need was perceived (Table 3). A borderline interaction with service setting ($P < .10$) suggested that the effect was strongest for general health and weakest for school services (data not shown in tables). A significant interaction by setting ($P < .05$) was observed for provider preference (Table 4). Parent preferences for mental health and general health professionals predicted higher use of mental health and general health services, respectively. Provider preference did not influence school service use. Although no other attitudinal variables were associated with use of all three settings, interactions of borderline statistical significance ($P < .10$) were observed for two of them. Maternal distress was associated with higher use of mental health settings. Parents reporting that they would definitely use services were more likely to bring their children to general health settings than parents with lower help-seeking propensity (data not shown).

We had little a priori theoretical justification for examining other interactions between service use and sociodemographic, illness, and attitudinal factors other than the possible effect modification by service setting. We tested one hypothesis that cultural and attitudinal factors influencing service selection are more pronounced among asymptomatic than symptomatic children[37,38] by repeatedly refitting our final model (model 3). Each time, we added a single interaction term between one demographic or attitudinal variable and the Child Behavior Checklist total score. Results for significant interactions at the .05 level with Child Behavior Checklist total score are presented in Table 5. Asymptomatic children raised by single-parent mothers were more likely to receive services than their counterparts in two-parent families; among symptomatic children, no differences were observed. Similarly, the correspondence between service use patterns and provider preferences appeared to be more pronounced among asymptomatic than symptomatic children. A third interaction with social class did not support the hypothesis.

Finally, we examined individual interactions between sociodemographic variables and the factor showing the strongest association with service use in our data, perceived need for services. Only one interaction, involving maternal education,

TABLE 4—Multivariate Huber Logistic Regression Analyses of Service Use for Problems Noted on the Child Behavior Checklist: Children 6 to 11 Years Old, Connecticut, 1986 through 1989

	Odds Ratio (95% Confidence Interval)		
	Model 1		
	MH	GH	SCH
Maternal education less than high school	0.82 (0.46, 1.44)	1.08 (0.64, 1.83)	1.58 (1.08, 2.30)
Family stressors present	3.12 (1.88, 5.19)	1.55 (1.06, 2.27)	1.53 (1.15, 2.04)
Academic problem present	. . . . .	. . . . .	. . . . .
Provider preference			
Mental health	. . . . .	. . . . .	. . . . .
General health	. . . . .	. . . . .	. . . . .
School	. . . . .	. . . . .	. . . . .
	Model 2		
	MH	GH	SCH
Maternal education less than high school		0.98[a] (0.71, 1.35)	
Family stressors present	2.38 (1.42, 3.99)	1.16 (0.78, 1.71)	1.13 (0.83, 1.55)
Academic problem present	1.56 (1.05, 2.31)	1.70 (1.17, 2.45)	5.70 (4.25, 7.65)
Provider preference			
Mental health	. . . . .	. . . . .	. . . . .
General health	. . . . .	. . . . .	. . . . .
School	. . . . .	. . . . .	. . . . .
	Model 3		
	MH	GH	SCH
Maternal education less than high school		1.09[a] (0.79, 1.50)	
Family stressors present	2.47 (1.45, 4.21)	1.09 (0.72, 1.63)	1.08 (0.79, 1.49)
Academic problem present	1.18 (0.79, 1.78)	1.36 (0.95, 1.97)	5.18 (3.85, 6.99)
Provider preference			
Mental health	1.69 (0.85, 3.34)	1.26 (0.70, 2.27)	1.20 (0.76, 1.88)
General health	0.38 (0.16, 0.91)	1.63 (0.88, 3.02)	1.14 (0.71, 1.84)
School	0.42 (0.15, 1.12)	0.94 (0.38, 2.36)	1.17 (0.66, 2.09)

Note. Contacts made solely for educational, speech, or physical health problems were excluded. *P* values for homogeneity of effects across settings were less than .05. Model 1 included sociodemographics only. Model 2 included sociodemographics and illness profile. Model 3 included demographics, illness profile, and parental attitudes. MH = mental health setting; GH = general health setting; SCH = school setting.
[a]A common odds ratio across all three settings (*P* value for interaction between variable and setting greater than .05).

was significant (Table 5). This result should be interpreted cautiously in view of the lack of concrete prior hypotheses and the number of interactions examined.

Discussion

This study is one of few contemporary investigations that has employed population survey data to examine factors associated with service use for child psychopathology. One strength of this approach is that the service patterns are representative of a large geographic area. Thus, our findings have greater generalizability than those of previous studies based on characteristics of individual mental health clinics and their user populations.[9]

Sociodemographic Factors

We found that most sociodemographic characteristics were associated with service use in all three settings. Our "family stressors" measure was the only factor associated with a particular setting (mental health) when the child's illness and parental attitudinal measures were controlled in the analysis. Thus, many sociocultural measures that have previously been studied only in relation to mental health services appear to influence help seeking for child psychopathology across a variety of milieus, pointing to the importance of examining multiple service settings in future research.

Individual sociodemographic factors associated with service use in our study are generally consistent with prior research. Similar to our findings, most previous studies have reported elevated service use for boys relative to girls[9–13,15–18] and for single-parent relative to two-partner households.[11,18–20,22–24] We identified only one prior study examining religion, and it also noted underuse by Catholics.[23] Our finding of underuse by Black and Hispanic minority groups is also supported by previous studies that controlled for socioeconomic status (SES) and may reflect unmeasured cultural

TABLE 5—Multivariate Huber Logistic Regression Results for Factors Significantly Modified by the Child's Symptomatology and the Parent's Perceived Service Need: Children 6 to 11 Years Old, Connecticut, 1986 through 1989

	Model 3 Odds Ratios					
	MH	GH	SCH	MH	GH	SCH
	CBCL total score					
	Normal			Borderline/clinical		
Single-mother household		1.76[a]			1.00[a]	
Social class						
Middle		1.02[a]			0.78[a]	
Low		0.71[a]			1.68[a]	
Preferred provider						
Mental health	2.79	2.07	1.75	0.94	0.70	0.59
General health	0.55	2.41	1.52	0.26	1.14	0.72
School	0.65	1.46	1.63	0.24	0.54	0.60
	Child needs services					
	No			Yes		
Maternal education less than high school		1.42[a]			0.64[a]	

Note. CBCL = Child Behavior Checklist. Contacts made solely for educational, speech, or physical health problems were excluded. *P* values for interactions between variables were less than .05. Model 3 included sociodemographics, illness profile, and parental attitudes. MH = mental health setting; GH = general health setting; SCH = school setting.
[a]A common odds ratio across all three settings (*P* value for interaction between variable and setting greater than .05).

attitudes about help seeking.[11,12] Finally, previous findings for child's age have been mixed and appear to depend on the age range of the sample.[8–14]

Patterns of service use by different social classes have reportedly changed in recent years. Increasing use of services by lower classes has been attributed to the growing availability of publicly funded services.[9,13] In our study, social class showed no association with service use, which may reflect the large range of private and public services available in the study region. Increased use among low-SES families in one subgroup (children with high Child Behavior Checklist total scores) may also be linked to the availability of public services for low-income families. Langner et al. observed a similar pattern among welfare families in Manhattan.[21]

Several sociodemographic factors failing to show associations with service use in our study warrant comment. First-born children, previously identified as receiving more services,[12,14] did not differ from children of other birth orders in our study. Similarly, sibship size, which has been shown to be inversely associated with service use in several studies,[12,14,19,20] was unrelated to service use in our sample. Rural–urban residence, which has shown mixed results,[6,8,39] was not associated with service use when we controlled for other factors in our data.

Illness Profile Factors

As with sociodemographic factors, most illness profile variables were associated with use across all settings. Previous research has pointed to the importance of externalizing behaviors, such as aggression or delinquency, in determining service use.[5,15] The Child Behavior Checklist Externalizing scale score was associated with service use in univariable analyses, but this association disappeared in the multivariate models. We explored possible collinearity between Child Behavior Checklist total and Externalizing scale scores by dropping the total scores from the multivariate models, but the externalizing effect remained essentially null. In agreement with previous studies,[10,19,21] internalizing symptoms and impairment ratings were also associated with increased service use in the univariable analyses, but their effects diminished substantially when parental attitudinal factors were controlled in our final model. Unlike these variables, the effect of overall disturbance (Child Behavior Checklist total score) remained significant even after attitudinal factors had been controlled.

It is well established that coexisting conditions increase the likelihood of seeking treatment,[40] and this finding was confirmed in our study. Previous studies have reported that coexisting health and academic problems are associated with selection of services in general health and school settings, respectively.[5,10] In our study, academic difficulties were indeed influential in the selection of school-based services; however, health problems were associated with more use of all services, not just general health services.

Parental Attitudinal Factors

In our study, the factor most strongly associated with service use was the parent's report that the child needed help for a problem identified on the Child Behavior Checklist. Our measure of "perceived need for help" was similar to the "parental concerns" measure assessed by Dulcan et al. in a pediatric primary care setting.[30] These investigators found increased referrals to mental health specialists when parents reported their concerns about children's behavior problems to pediatricians. Our study suggests that, in addition to triggering referrals to tertiary care, parental concerns about a child's need for treatment may initiate help seeking across a variety of settings, independently of symptom profile. As was the case in the Dulcan et al. study,[30] we were unable to identify sociocultural factors that explained or moderated the effect of this variable. Because perceptions of need may be altered by the treatment process, it will be important to reexamine this factor in a longitudinal design.

We found some evidence suggesting that parental attitudes may be associated with use of selected settings. A weak interaction between perceived need for help and service setting pointed to the highest increase in general health service use and the lowest increase in school services. Other attitudinal measures (provider preference, maternal distress, likelihood of seeking services) also influenced selection of individual settings. Although most of the interactions were marginal, they suggest that more intensive investigation of parental attitudes in service selection is warranted.

Limitations and Recommendations

Several weaknesses of our study should be noted. Our data were gathered cross sectionally, and prior service use may have biased some of our estimates, particularly those for attitudinal factors. When our results are interpreted, the study context should be taken into consideration. The setting was a northeastern US state with a fragmented service delivery system typical of most children's services of the period. Greater access to specialty services, particularly in the mental health sector, may be found in areas where comprehensive systems of care have been implemented.[41,42] Also, the extensive use of school-based services may reflect the age range of our study cohort. Different patterns of services and associated factors may be found in cohorts of older and younger children.

Our study measures were also limited in several ways. We relied on the report of a single informant, the child's parent (usually the mother). Although we consider the parent to be the best informant about service use in the age group under study, comparisons with future studies employing teacher informants are recommended, particularly for school-related factors. Parent questionnaires did not obtain information on insurance, which may determine the use of school programs offered at no cost to families vs the use of mental health and general health clinics charging fees for services. We did not assess psychiatric disorders using the criteria of the American Psychiatric Association,[43] and impairment was measured with a single-item measure. One implication is that "perceived need for treatment" may capture some of the unmeasured psychopathology in our study, thus resulting in an overestimate of this variable's association with service use. For most other independent variables, we believe that the reporting error would be nondifferential and would therefore attenuate our measures of association.

Although parental recall of service use has been previously reported to have acceptable accuracy,[44] service use may have been underestimated in our study, particularly for problems occurring early in the 1-year reporting interval and for brief contacts in the distant past for chronic problems. We recorded service contacts only for behavior checklist problems, and thus our measure differs from those of other studies assessing all service use or use for psychiatric syndromes.[5,6] It is also possible that more complex biases in reports of service use are associated with the sociocultural backgrounds of respondents. For example, the absence of association between SES and service contacts may have been due to a higher recall rate but lower service use among higher SES households, counterbalanced by higher service use but a lower recall rate among lower SES women. Unfortunately, we lack sufficient external information to guide informative sensitivity analyses of measurement error, and we therefore recommend further efforts to replicate these results.

Our results confirm the well-known biases in studies enrolling children from treatment settings. We found that children using services are not representative of the general population with respect to many risk and prognostic factors, suggesting that other financial, social, or administrative barriers may be operating in the help-seeking process. Thus, caution should be exercised in drawing samples from treatment settings unless the stated goal of the study is to make inferences about the highly selective population of children already in treatment.

Our findings indicate that health and educational settings are widely used for treatment of emotional and behavioral problems in school-aged children and that help seeking in these settings is influenced by a number of sociocultural and illness factors that have previously been examined only for traditional mental health settings. Our study reinforces contemporary initiatives to involve multiple service sectors in comprehensive child mental health system development and service research. □

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