Service Utilization and Psychiatric Diagnosis in Pediatric Primary Care: The Role of the Gatekeeper

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ABSTRACT. Levels of morbidity in 789 children 7 to 11 years of age attending two primary care pediatric clinics in a health maintenance organization were examined in relation to psychiatric disturbance. Physical morbidity was measured as mean number of illness episodes per year enrolled, based on the child's medical record. Two measures of psychiatric disturbance were compared: the pediatricians' judgment and a detailed assessment using standard psychiatric interviews with parent and child. Children identified by pediatricians as disturbed had more than twice as many physical illness episodes as nonidentified children. Children identified by the standard psychiatric assessment had the same number of physical illness episodes as nondisturbed children. Pediatricians showed high specificity but low sensitivity to mental illness. Their sensitivity in the high user group was double that in the low user group. These results suggest that (1) the association between mental illness and high use may be, in part, the result of the confounding factor of physicians' judgment; (2) in settings where primary care practitioners serve as "gatekeepers" to mental health services, the offset effect of lower medical service use following psychiatric treatment may be partially explained by this; (3) the source of referral must be taken into account when assessing the offset effect in other settings. Pediatrics 1988;82(pt 2): 435-441; primary care, psychiatry, health maintenance organization.

For 20 years, studies have shown that both children and adults with psychiatric disorders make more use than other people of nonpsychiatric medical services. Hankin and Oktay reviewed the literature up to the end of the 1970s, and a brief summary of the major studies published in the 1980s is given in Table 1. In general, patients requiring mental health care make 20% to 100% more nonmental health visits to health services, are more likely to be frequent users of services, or cost 20% more per year to treat for nonpsychiatric problems, depending on the method of analysis used.

The reasons why mental illness and high use should be associated are not clear. It has been suggested that mental health problems could "predispose [people] to physical illness, or encourage attention to a symptom which might otherwise be ignored, or be the result of a physical morbidity." A characteristic shared by many empirical studies of psychiatric disorders in primary medical care is that they have been carried out in settings in which a primary care physician acts as "gatekeeper" to psychiatric or other specialist services. This is standard practice in the United Kingdom, and in the United States it is widespread in prepaid health care systems, such as HMOs. For recent studies of mental health service referrals, whether patients were referred by the primary care provider or by themselves, or whether both modes of access were

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**TABLE 1.** Studies of Mental Health and Service Use Published Since 1979*

<table>
<thead>
<tr>
<th>Study</th>
<th>Persons Studied</th>
<th>Who Referred</th>
<th>Criterion for MH Visit or Diagnosis</th>
<th>% With MH Visit/Diagnosis</th>
<th>Relationship Between MH and Other Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacobson et al²</td>
<td>Children</td>
<td>?</td>
<td>Visit</td>
<td>3.4–10.1</td>
<td>MH patients paid 1.5 to 5.6 more visits to non-MH departments than non-MH patients; but higher use mainly in nonpediatric departments</td>
</tr>
<tr>
<td>Goldberg et al³</td>
<td>Children and adults</td>
<td>Other</td>
<td>Visit</td>
<td>NA (case/control)</td>
<td>Ratio of MH to non-MH visits in year before psychiatric visit = 1.12; during psychiatric visit period (4 mo) = 0.93; after = 1.04; but hospitalization went down</td>
</tr>
<tr>
<td>Hankin et al⁴</td>
<td>Children and adults</td>
<td>Either (70% self)</td>
<td>Visit Diagnosis</td>
<td>1.9–12.4</td>
<td>Ratio of MH to non-MH patients' visits: 1.24–2.0</td>
</tr>
<tr>
<td>Kessler et al⁵</td>
<td>Children and adults</td>
<td>Either (70% self)</td>
<td>Visit Diagnosis</td>
<td>5.1–15.7</td>
<td>% decrease in medical visits following psychiatric treatment: 6.3% (adult women), 11.0% (adult men), 8.3% (children)</td>
</tr>
<tr>
<td>Regier et al⁶</td>
<td>Children and adults</td>
<td>Either</td>
<td>Diagnosis</td>
<td>3.5–12.3</td>
<td>Ratio of MH to non-MH patients' visits (non-MH) in 1975 in 4 settings: 1.4–1.9</td>
</tr>
<tr>
<td>Schlesinger et al⁷</td>
<td>Adults</td>
<td>Self</td>
<td>Treatment</td>
<td>NA (case/control)</td>
<td>Costs in 1 yr $537 (non-MH), $636 (MH), excluding MH costs</td>
</tr>
<tr>
<td>Hankin et al⁷</td>
<td>Children and adults</td>
<td>Either (70% self)</td>
<td>Visit</td>
<td>5.5 (+1% diagnosis untreated)</td>
<td>Significant difference in service use by treated vs comparison groups (treated MH group 21% fewer non-MH visits than nontreated MH group)</td>
</tr>
<tr>
<td>Hankin et al⁸</td>
<td>Children</td>
<td>Either</td>
<td>Visit</td>
<td>17</td>
<td>23% of MH patients were high users, 10.7% of non-MH patients were high users</td>
</tr>
<tr>
<td>Kessler et al⁹</td>
<td>Adults</td>
<td>Diagnosis</td>
<td>Point prevalence</td>
<td>26.4</td>
<td>“New” cases had highest use, continuing cases highest primary care use. Ratio of MH to non-MH: 1.37 (total visits) 1.2 (primary care)</td>
</tr>
</tbody>
</table>

MH, mental health.

available, is shown in Table 1. However, even in self-referred cases, the issue may well have been discussed with primary care physician, whose judgment may have influenced the self-referral.

If a relationship exists between high use and the identification of psychopathology by a "gatekeeper," two hypotheses are tenable: (1) the association between high service use and psychopathology exists only in those identified by clinicians, in which case treatment of identified cases may be expected to reduce use rates or (2) the association exists in nonidentified, as well as identified cases, in which case the impact on use rates will depend on the proportion of disturbed persons identified by clinicians, in health care systems controlled by gatekeepers.

The study reported here is the first large scale investigation to address this issue in pediatric primary care by comparing pediatricians' diagnoses of psychopathology with independent assessments of children using standard psychiatric instruments of known validity and reliability. Data from the study are used to address the following questions: (1) Are children with emotional and behavioral problems diagnosed by pediatricians more frequent users of medical services than other children? (2) Are children with psychopathology diagnosed by independent measures more frequent users of medical services than other children? (3) Are children with psychopathology diagnosed by pediatricians more frequent users of medical services than children with psychopathology diagnosed by independent measures? (4) Do pediatricians identify emotional or behavioral problems more accurately in children with a history of specific types of medical illness, other than psychiatric illness?
Setting

The study was carried out in a large HMO. Mental health services are provided almost entirely by the HMO's own staff of psychiatrists, psychologists, counselors, and social workers. Except for a restriction on the number of days of hospitalization paid for by the plan, cost is not a barrier to referral or treatment for psychiatric problems. All children must, however, be assessed by a pediatrician before being referred for psychiatric evaluation.

Two of the six medical centers operated by the HMO were used for the study. The “urban” site was close both to two large universities and to an area of the city inhabited mainly by a poor, black population and drew its subscribers from both settings. The “suburban” site draw its subscribers from a wide geographical area; most of them were white and worked mainly in light manufacturing and service industries. Each site had approximately 1,400 children 7 to 11 years of age enrolled.

Measures

The Child Behavior Checklist was completed for all 789 children in the study, as a screening instrument. It is a questionnaire composed of behavior problems and social competence items, completed by parents about their children.13 It has been widely used and its performance is well established.13,14 The checklist has been standardized on 1,300 “normal” children 4 through 16 years of age and 1,300 children referred for mental health care.

The Diagnostic Interview Schedule for Children (DISC),15 a detailed psychiatric interview, was given to the subsample of 300 parents and children by social workers with experience in child psychiatric care. The instrument consists of two parallel interviews, the DISC-C for children and the DISC-P for parents or caretakers. It was commissioned by the National Institute of Mental Health as a structured psychiatric interview for epidemiologic studies for which consistent, detailed information about a wide range of current psychiatric symptoms needs to be obtained and can be computer scored to yield diagnoses according to criteria of the Diagnostic and Statistical Manual of Mental Disorders, ed 3 for most psychiatric disorders. Each of the DISC interviews takes one to 1½ hours to complete and is too lengthy for routine use in a primary care setting. It does, however, provide a valuable means of validating the results of the screening instrument, because it has been found to give both reliable and valid results in clinical studies.16,17 A Health Practitioner Report, designed for this study, was completed by the pediatrician for each child. The pediatrician notes how many times he or she has seen the child before; the presenting complaint; the main medical diagnostic formulation, and a second one if appropriate; whether the pediatrician knows of any family history of emotional, behavioral, or learning problems, or major family stressors; whether the child is mentally retarded or developmentally delayed; and finally, using the International Classification of Disease, American version, ed 9, any current psychiatric diagnoses.

Emotional and behavioral problems were defined in three ways: (1) the pediatricians' International Classification of Disease, ed 9, diagnoses of emotional and behavioral problems, made at the index visit; (2) the presence of one or more Diagnostic and Statistical Manual of Mental Disorders, ed 3, diagnoses based on the psychiatric interview with the parent (DISC-P); (3) a total behavior problem score at the index visit above the “disturbed” level of the Child Behavior Checklist, ie, at or above the level seen in 74% of children referred for mental health care, but in only 10% of nonreferred children.13

Other Measures

Service use was measured in the following ways: (1) Medical illness episodes were recorded from the child's medical record from age 3 years to the index visit. An illness episode was defined by all the information in the chart pertaining to a single continuous illness episode of one diagnosis. Episodes of psychiatric disorders were excluded from the calculation of illness episodes. The mean number of illness episodes per year was calculated for each child enrolled in the HMO. The distribution of scores was skewed by a large number of children with few episodes, therefore, a log transformation was carried out before parametric analyses were performed. Because the results are similar, figures for nontransformed variables are used in the text for greater clarity. (2) Disorders were recorded under International Classification of Disease, ed 9, category headings. A child could thus have multiple episodes of a given disorder. As before, psychiatric disorders were excluded, and a log transformation of the mean annual number of disorders was calculated for use in parametric analyses. In addition, a seriousness rating was made, to identify children with major chronic or life-threatening illness. The rating was determined by the physicians in the research team on the basis of the international classification codings and checked against the child’s chart for accuracy. Only 11 children (4%)...
had a serious condition (asthma, diabetes, generalized epilepsy, and arthritis).

Procedure

Morning, afternoon, and evening clinic sessions were sampled in proportion to the number of hours of each type of session during a given month. A total of 51% of clinic hours were sampled during one calendar year. When an eligible child came to one of the two clinics, a research assistant explained the study to the accompanying adult (the mother in 88% of cases), obtained consent, and asked her to complete the Child Behavior Checklist about the index child. The health practitioner form was attached to the child's medical record, to be completed by the pediatrician who saw the child at that visit. Only one age-appropriate child was screened from any family; children were only screened once and were only eligible for screening three times: if they visited the clinic more often but for some reason had not previously been screened they were excluded from the sampling pool as a precaution against oversampling children with multiple visits.

A subsample of screened children was recruited for intensive parent and child interviews, using the DISC. This group consisted of all children scoring in the clinical range on the Child Behavior Checklist and a random sample of children scoring in the normal range. A total of 789 completed screens were obtained, and a subsample of 300 families was interviewed: 126 families had a high scoring index child and 174 had a low scoring child. Estimates of results for the entire screened sample were calculated by weighting the results for the two groups for their sampling fraction. Refusal rates were 6% for the screening phase and 26% for the interview phase. Families of children scoring high and low on the Child Behavior Checklist were equally likely to refuse to be interviewed.

RESULTS

Pediatricians' Diagnoses of Psychiatric Problems and Service Use

The pediatricians identified one or more psychiatric problems in 5.7% of the sample (weighted estimate: 95% confidence interval 3.8% to 7.6%). Children identified by their pediatricians as having a current emotional or behavioral problem had almost twice as many medical illness episodes recorded: 5.6 compared with 3.4 (F 10.5, P = .001). Thus, the data from this study are consistent with previous research in finding that emotional and behavioral disorders are more likely to be reported by pediatricians in children with high levels of service use.

Independent Assessments of Psychiatric Problems and Service Use

When either the psychiatric interview (DISC-P) or the screening questionnaire (Child Behavior Checklist) was taken as the criterion of psychopathology, rather than the pediatricians' diagnosis, disturbed children had only a slight, statistically nonsignificant, increase in mean illness episodes (4.0 compared with 3.4; F < 1 for both measures). Other measures of service use taken from the medical records, eg, number of different disorders, and number of contacts during a 3-month follow-up period, revealed the same pattern: children identified by pediatricians as disturbed had higher levels of service use, but children identified by the independent assessments did not.

Medical Illness Episodes in Relation to Pediatricians' and Independent Assessments of Psychopathology

The mean numbers of nonpsychiatric illness episodes per year enrolled, for children identified and not identified as disturbed by pediatricians, by their status on the independent assessment of psychopathology, are shown in the Figure. It can be seen that one group stands out: the disturbed, identified children had more than twice as many illness episodes as any other group. Post hoc analysis showed that disturbed, identified children were significantly different from each other group. Analyses using other measures of use, eg, number of clinic visits or number of different disorders, showed the same effect.

Factors Associated With High Use Rates

We examined the possibilities that (1) a history of certain types of illness was associated with a
higher probability of current emotional or behavioral problem and (2) pediatricians identified such problems more accurately in children with histories of certain types of medical illness. The reason for this analysis was to determine whether it was certain types of illness, rather than frequency of service use per se, that made a diagnosis of psychopathology more likely. As Table 2 shows, the pediatricians' tendency to associate high service use with psychiatric disorder was not specific to children with high levels of any one type of illness but was characteristic of most categories of illness, although the results were statistically significant for only six categories (Table 2). By contrast, the only category in which children assessed as disturbed on the psychiatric interview had more illness episodes than the non disturbed (except for mental illnesses) was that of “accidents, injuries, and poisonings,” in which disturbed children had 1.6 times as many illness episodes as nondisturbed (0.98 compared with 0.61). In general, the pediatricians' greater sensitivity to psychiatric disorder in high users was not specific to any particular illness or system (Table 2).

The results of this study suggest that in settings where the primary care physician is the gatekeeper to specialist services, it is possible that physicians' identification of mental illness may act as a confounding factor and that high use is associated with psychiatric disorder recognized by physicians, rather than with psychiatric disorders. Importantly, both the Child Behavior Checklist and the DISC identified more children as disturbed than did the pediatricians. The prevalence rate of psychiatric disorder according to the parent interview was twice the rate of diagnoses made by the pediatricians (11.8%, 95% confidence interval 9.6% to 14.0% compared with 5.7%, 95% confidence interval 3.8% to 7.6%). The pediatricians' sensitivity to the presence of a psychiatric disorder was in general low (16%), although their specificity was high (95%). The effect of high service use was to raise pediatricians' sensitivity to 33%; in the low use group sensitivity decreased to 12%. Specificity was high in both groups (95% and 96%, respectively). Thus, it can be argued that, rather than being too ready to see high users as mentally ill, pediatricians were somewhat more accurate in their judgments in this group than in the children with normal levels of illness and service use.

**DISCUSSION**

The wider significance of these findings depends on several points.

**Do Primary Care Pediatricians in General Underdiagnose Mental Illness?**

High use is a useful cue to the presence of psychopathology only if primary care pediatricians generally underdiagnose such problems. In other situations, the use of this cue will raise the proportion of misdiagnosed false-positive diagnoses (column B in Table 2) to a higher level. Unfortunately, there are few studies in which diagnostic rates based on both primary care physician and an independent

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>INTERNATIONAL CLASSIFICATION OF DISEASE, 9TH EDITION</th>
<th>IDENTIFIED</th>
<th>NOT IDENTIFIED</th>
<th>IDENTIFIED</th>
<th>NOT IDENTIFIED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infections, parasitic</td>
<td>0.78</td>
<td>0.84</td>
<td>0.53</td>
<td>0.66</td>
<td></td>
</tr>
<tr>
<td>Endocrine, metabolic</td>
<td>0.11</td>
<td>0.00</td>
<td>0.08</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Nervous system, sense organs</td>
<td>0.89</td>
<td>0.91</td>
<td>0.71</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>Circulatory system</td>
<td>0.11</td>
<td>0.00</td>
<td>0.02</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>Respiratory system</td>
<td>2.33</td>
<td>2.04</td>
<td>1.23</td>
<td>1.30</td>
<td></td>
</tr>
<tr>
<td>Digestive system</td>
<td>0.56</td>
<td>0.25</td>
<td>0.13</td>
<td>0.16</td>
<td></td>
</tr>
<tr>
<td>Genitourinary system</td>
<td>0.22</td>
<td>0.05</td>
<td>0.07</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>Skin, subcutaneous tissue</td>
<td>0.78</td>
<td>0.36</td>
<td>0.35</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal system</td>
<td>0.44</td>
<td>0.31</td>
<td>0.07</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Congenital disorders</td>
<td>0.22</td>
<td>0.00</td>
<td>0.02</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Signs, symptoms</td>
<td>0.33</td>
<td>0.53</td>
<td>0.23</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Accidents, injuries, poisoning</td>
<td>2.22</td>
<td>1.20</td>
<td>0.75</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>Mental disorders</td>
<td>0.56</td>
<td>0.25</td>
<td>0.13</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>Well-child visits</td>
<td>0.78</td>
<td>0.42</td>
<td>0.54</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Serious disorders</td>
<td>0.22</td>
<td>0.11</td>
<td>0.04</td>
<td>0.03</td>
<td></td>
</tr>
</tbody>
</table>

* Results are mean annual illness episodes.
† Significantly different from other figures in row, P < .01.
assessment are reported. The review of the literature by Wilkinson\textsuperscript{18} concerning mental illness in primary care included, among 148 data-based papers, only 16 (11\%) providing any independent assessment of psychopathology and only five (3\%) using a clinical assessment by a psychiatrist as the standard of comparison. However, in all but one of these studies, whether interview or self-report methods of evaluation were used, underdiagnosis was a consistent finding. For example, in a longitudinal study of patients attending a large multispecialty group practice in Wisconsin, Kessler et al\textsuperscript{10} found that primary care physicians identified only 20\% of patients who received a psychiatric diagnosis at both of two psychiatric interviews 6 months apart.

There are no studies in the United States, other than the one reported here, in which pediatricians’ judgments are compared directly with independent assessments of children. However, a review of the literature\textsuperscript{19} shows that pediatricians in the United States tend to identify less than half the amount of psychopathology found in general community-based surveys. In no study of pediatric primary care is the case identification rate higher than the median for population samples. Thus, it is likely that underdiagnosis is a general phenomenon in pediatric primary care settings, at least in the United States. The diagnostic rates found in this study (5.7\% for pediatricians, 11.8\% for parental assessment) are close to the median for pediatrician-based and community-based studies respectively.\textsuperscript{19} Therefore, it seems reasonable to generalize to other psychiatric settings.

### Is a Higher Level of Service Use Seen in Self-Referred Psychiatric Patients as Well as Those Referred by Primary Care Providers?

In the introduction, we pointed out that in some primary care settings (such as the British National Health Service, and some HMOs) primary care physicians are gatekeepers\textsuperscript{12} to all specialist care, whereas in other settings self-referral is also possible. Because findings were not separately analyzed for self-referred and physician-referred patients in the published studies, it is not possible to answer this question. Our data would predict that children, at least, would not show any association between illness episodes and mental health referrals by self (or parent) because service use is in general uniformly low among all but the small group of identified, disturbed children. However, this needs to be tested in other settings.

There are some other characteristics of this study that limit the generalizability of the findings. First, it was carried out in an HMO, and the findings may not apply in fee-for-service settings. It should, however, be noted that previous studies show no difference in the diagnostic rates of pediatricians in fee-for-service settings and those in HMOs.\textsuperscript{2}

Second, the structured psychiatric interviews used to assess psychopathology are not normally used as a diagnostic tool in settings such as the mental health departments of HMOs or other primary care psychiatric practices. The interviews used were specifically designed for epidemiologic community studies, adopting a highly structured approach designed to maximize reliability rather than to imitate current practice. However, it is of interest that when the data from this study were analyzed using as the criterion of psychopathology the judgment of the mental health clinicians who carried out the interviews, rather than the computer-scored algorithms, the pattern of results was the same. The rate of diagnosis by these clinicians was, however, much higher than the computer-generated rate, indicating an even wider disparity between pediatricians’ perceptions and assessments by mental health specialists. Thus, the use of computer-generated diagnoses in this study is not in itself a reason to anticipate that the difference between pediatric and psychiatric assessments of children in primary care will not appear in other studies.

A further limitation on the generalizability of the findings is the restricted age range of the children studied (7 to 11 years). There are, however, no data yet available concerning the relationship between independently assessed psychopathology and service use in other age groups.

### If This Study’s Findings Are Replicated Elsewhere, What Are the Implications for Primary Health Care?

First, the study suggests that improving the diagnostic skills of primary care practitioners in the area of mental illness, although clearly important for all sorts of reasons, may not have the effect of reducing medical care use as much as might be projected from earlier reports. The disturbed high users may already be overrepresented among that proportion of disturbed patients who are receiving mental health care, at least in settings where identification by a primary care practitioner determines who receives such services.

Second, it raises questions about the argument that increasing access to mental health care could reduce other medical costs. Future studies need to specify clearly the path by which patients come into specialist mental health care, so that the effect of...
psychiatric treatment on use can be evaluated independently of the possible confounding effect of the primary care practitioner's judgment.

Neither of these issues, however, diminishes the importance of a high quality of care to that majority of the mentally ill, both children and adults, for whom primary care is the first or only source of help. At a time when gatekeeper systems are gaining popularity with politicians and insurance companies for their anticipated ability to contain costs, and with the public for the comprehensive services they provide, it is important to consider their effect on patient care and the implications for the training of future primary care physicians.

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