Identification and Management of Psychosocial Problems Among Toddlers in Dutch Preventive Child Health Care

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Objectives: To assess the degree to which preventive child health professionals (CHPs) identify and manage psychosocial problems among preschool children in the general population and to determine the association with parent-reported behavioral and emotional problems, sociodemographic factors, and mental health history of children.

Design: The CHPs examined the child and interviewed the parents and child during their routine health assessments. The Child Behavior Checklist (CBCL) was completed by the parents.

Setting: Sixteen child health care services across the Netherlands that routinely provided well-child care to nearly all preschool children.

Patients: Of 2354 children aged 21 months to 4 years who were eligible for a routine health assessment, 2229 (94.7%) participated.

Main Outcome Measures: Identification and management of psychosocial problems by CHPs.

Results: In 9.4% of all children, CHPs identified psychosocial problems. Two in 5 of the CHP-identified children were referred for additional diagnosis and treatment. Identification of psychosocial problems and subsequent referral were much more likely in children with a clinical CBCL total problems score than in others (identification: 29% vs 7%; odds ratio [95% confidence interval], 5.40 [3.45-8.47]; referral: 15% vs 3%; odds ratio [95% confidence interval], 6.50 [3.69-11.46]).

Conclusions: The CHPs frequently identify psychosocial problems in preschool children, although less than among school-aged children, but they miss many cases of parent-reported problems as measured by a clinical CBCL score. This general population study shows substantial room for improvement in the early identification of psychosocial problems.


Psychosocial problems, such as social-emotional and behavioral problems, are highly prevalent among children and adolescents and may severely interfere with everyday functioning of children and their families.1-3 Interest in the occurrence of these problems among toddlers has grown recently,2,4-7 whereas previous research mostly focused on school-aged children.3,8 As a consequence, relatively little is known of the occurrence of these problems among toddlers and the possibilities for early detection and subsequent treatment. Evidence in the general population is also lacking.

Early detection and treatment may improve the prognosis of psychosocial problems among preschool children. First, psychosocial problems in preschool children may continue in later stages of life. Lavigne et al4 found that more than 50% of children with psychiatric disorders at age 2 and 3 years continued to have a psychiatric disorder 3.5 to 4 years later, using a variety of measures, including the Child Behavior Checklist (CBCL), to assess a psychiatric disorder. Similarly, in a retrospective study of antisocial behavior in adolescence, Moffitt and Caspi9 showed that adolescents with childhood-onset problems already had behavior problems at age 2 or 3 years, whereas Aguilar et al10 showed social-emotional indices to be similarly predictive. Mesman and Koot6 found parent-reported internalizing and externalizing problems of preschool children to be predictive of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, counterparts 8 years later. Second, available reviews show that early interventions may be effective in preventing the continuation of psychosocial problems, especially antisocial behavior.11,12

In the Netherlands, preventive child health care offers an ideal opportunity for
the early detection of psychosocial problems among pre-
school children, comparable to community pediatrics in
the United States. In this system, child health profession-
als (CHPs) (ie, physicians and nurses) working in pre-
ventive child health care offer routine well-child care, in-
cluding the early detection of psychosocial problems, to
the entire Dutch population. Access is independent of
insurance status, but the services do not provide treat-
sment services, in contrast to the US system.

We previously reported on the degree to which Dutch
CHPs identified and managed psychosocial problems in chil-
dren aged 4 to 16 years. One or more psychosocial prob-
lems were identified in 25% of all children, and 1 in 5 of
the identified children were referred for further diagnosis
and treatment. Results further showed that identification
of psychosocial problems in children and subsequent re-
ferral were 6 times more likely in the 8% with serious parent-
reported problem behavior (measured by the CBCL). How-
ever, CHPs identified no psychosocial problems in 43% of
these children and therefore undertook no action. We con-
cluded that screening for psychosocial problems may be a
promising option to reduce these problems among school-
aged children but that accuracy of the identification should
be enhanced, for instance, by training of professionals or
by the use of short screening questionnaires.

The aim of the present study is to assess the degree
to which CHPs identify and manage psychosocial prob-
lems among children aged 21 months to 4 years in the
general population. We also assess which child factors
are associated with the identification of psychosocial prob-
lems by CHPs and with their referral for further evalu-
ation and treatment. Finally, we compare our results with
a similar study of older children.

METHODS

Trained CHPs interviewed a national sample of parents on psy-
chosocial problems among their toddlers from October 1, 1997,
to June 30, 1998.

SAMPLE

The sample was obtained using a 2-step procedure. In the first
step, a random sample of 16 of 65 child health services was drawn
after stratification by region and degree of urbanization of their
district. In the second step, each clinic provided a random sample
of 75 children from their lists for 2 age groups: 2 years (±2 months)
and 3 years and 9 months (±3 months), using random numbers.
Of the 2354 eligible children, 2229 (94.7%) participated. The main
reason for nonresponse was lack of interest in the objective of the
study. The sample was obtained using a 2-step procedure. In the first
step, a random sample of 16 of 65 child health services was drawn
after stratification by region and degree of urbanization of their
district. In the second step, each clinic provided a random sample
of 75 children from their lists for 2 age groups: 2 years (±2 months)
and 3 years and 9 months (±3 months), using random numbers.
Of the 2354 eligible children, 2229 (94.7%) participated. The main
reason for nonresponse was lack of interest in the objective of the
study. The sample was representative for the entire Dutch popu-
lation, except that infants living in big cities were relatively un-
derrepresented due to the sampling procedure.

PROCEDURE AND MEASURES

The data were collected in a regular way as part of the preven-
tive health assessments to which all Dutch children are in-
vited regularly. The CBCL/2-3 was mailed to parents along with
the regular invitation to the preventive health assessment. The
CBCL was completed by the parents and returned to the re-
searchers in a sealed envelope. After each child’s physical ex-
amination, the CHP obtained sociodemographic and mental
health history information following a standardized interview
with the parents. After each assessment, the CHP responded
yes or no to the following question, “Does the child have a psy-
chosocial problem at this moment?” The CHP then scored the
type of identified problem(s) on a precoded list. Children who
only had risk indicators for the development of psychosocial
problems, such as parents with psychiatric problems or other
family problems, had to be coded as no. If a problem was iden-
tified, the CHP was asked to rate the severity of the problem
(mild, moderate, or severe) and to indicate how the problem
was managed (precoded question). The design of the study was
approved by the local medical ethical committee. It was simi-
lar to simultaneously performed studies on younger (1-6 months)
and older (4-16 years) children.

The CBCL/2-3 was used to assess the parent’s report on the
child’s behavioral and emotional problems during the pre-
ceding 6 months. The good reliability and validity of the CBCL/2-
3 established by Achenbach were confirmed for the Dutch
translation. The CBCL/2-3 consists of 99 problem items and
3 additional items regarding handicaps and parental worries.
Seven syndrome scales, 2 broad-band groups of syndromes des-
ignated internalizing and externalizing, and a total problems
score were computed. Internalizing consists of the withdrawn/
depressed and anxious syndrome scales, externalizing con-
sists of the oppositional, aggressive behavior, and overactive
syndrome scales, and sleep problems and somatic problems con-
stitute separate syndrome scales. The overactive syndrome scale
is specific for the Dutch version, whereas the further structure of
the instrument is similar to the US version. Cases were sub-
sequently allocated to a normal range or a clinical range of the
scoring distributions for each separate scale based on the Dutch
normative sample (H. M. Koot, PhD, written communication,
April 28, 1990). Cutoffs were set at the 97th percentile for the
7 syndrome scales and at the 90th percentile for the total prob-
lems and internalizing and externalizing scales.

The sociodemographic variables assessed were sex, age,
ethnicity, family composition, number of siblings living in the
family at the time of study, educational level and employment
status of the parent(s), degree of urbanization, duration of preg-
nancy, type of delivery, postdelivery hospitalization of the child,
parity, and day care. Ethnicity was based on the native coun-
try of the child and both biological parents. At least 2 of them
had to be born outside the Netherlands to qualify as non-
Dutch. Parental educational level was used as a measure of so-
cioeconomic status and based on the highest degree com-
pleted by the father or mother. Degree of urbanization was
assessed using the postal code of the address of residence.

Data on mental health history expressed whether the child
was currently being treated (point prevalence) or had been treated
(lifetime prevalence) for psychosocial problems. Response op-
tions included mental health professionals (eg, psychiatrist, psy-
chologist), medical professionals (eg, general practitioner, pe-
diatrician), and other professionals (eg, specialized family help,
parenting support). In addition, life events in the previous year
(such as hospitalization, death of family member, unemployment,
divorce) were assessed in a standardized way.

ANALYSIS

First, we examined the prevalence of psychosocial problems
as identified by CHPs. Second, we analyzed the management
strategies used by CHPs and their relation to the severity of the
problems. We used chi-squared tests to determine the statistical signifi-
cance of differences between distributions of categorical data.
Third, we assessed which child factors (CBCL problem scales,
sociodemographic variables, and [mental] health history vari-
bles) were related to the identification of psychosocial prob-
lems by CHPs (no or yes), using univariate and multivariate
logistic regression analyses. We repeated these analyses regard-
ing a referral for psychosocial problems by CHPs (no or yes).
All independent child variables were dichotomized.
Table 1. Management Strategies of CHPs in Case of Psychosocial Problems According to the Severity of the Problems as Rated by CHPs*  

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Children, Total No. (%)</th>
<th>Mild (n = 101)</th>
<th>Moderate (n = 79)</th>
<th>Severe (n = 19)</th>
<th>P Value†</th>
</tr>
</thead>
<tbody>
<tr>
<td>No action</td>
<td>31 (16)</td>
<td>19</td>
<td>13</td>
<td>11</td>
<td>.43</td>
</tr>
<tr>
<td>Advice or reassurance</td>
<td>144 (72)</td>
<td>79</td>
<td>65</td>
<td>68</td>
<td>.09</td>
</tr>
<tr>
<td>Follow-up with parents and child</td>
<td>47 (24)</td>
<td>18</td>
<td>22</td>
<td>63</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Consultation with others</td>
<td>28 (14)</td>
<td>9</td>
<td>13</td>
<td>47</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Referral to others</td>
<td>81 (41)</td>
<td>26</td>
<td>49</td>
<td>84</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Any action that implies follow-up (follow-up, consultation, and/or referral)</td>
<td>102 (51)</td>
<td>36</td>
<td>62</td>
<td>84</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Abbreviation: CHPs, child health professionals.  
*Non-treatment sample in which CHPs identified psychosocial problems (n = 200). More than one management strategy per child could be indicated.  
Data on severity are missing for 1 child.  
†P value (χ² test) for differences by severity in the occurrence of each option.

The regression analyses were performed using multilevel techniques because of the hierarchical nature of the data: characteristics of a CHP may have an impact on the assessments of all the children who are seen by the CHP. Multilevel models account for this clustering of individual data by the CHP (n = 108). 23,24

Prevalence estimates presented in the tables and text are weighted by region and age to adjust for differences between the study population and the Dutch population. Test statistics, odds ratios (ORs), and 95% confidence intervals (CIs) were calculated on the basis of the unweighted data.

RESULTS

PROBLEM IDENTIFICATION

In 200 (9.4%) of all 2229 children, the CHP identified 1 or more psychosocial problems. The severity of the problems was rated as mild in 50.8% of these cases, moderate in 39.7%, and severe in 9.5%. At the time of the study, 1.0% of all children were being treated for psychosocial problems by a mental health professional. This group was excluded from all further analyses and 1 child with missing data on CHP-identified problems (the remaining number of non-treated children was 2205).

MANAGEMENT STRATEGIES

The CHPs undertook actions in 84% of the non-treated children with identified psychosocial problems. Various management strategies were used: advice or reassurance (72.4%); consultation with day care, colleagues, or official authorities (24.1%); follow-up (23.6%); and referral to another professional (40.7%). Management strategies varied according to the severity of the problems as rated by the CHP (Table 1). Follow-up, consultation, and referral were more frequent in those children whose psychosocial problems were rated moderate or severe.

CHILD FACTORS RELATED TO PROBLEM IDENTIFICATION AND REFERRAL

Table 2 presents the number of non-treated children with a CBCL total problems score in the normal and clinical range who were identified by CHPs as having psychosocial problems and the management strategies used. Of the non-treated children, 6.1% had a CBCL total problems score in the clinical range (6.4% of all children). The CHPs identified psychosocial problems in 29.4% of the children with a CBCL total problems score in the clinical range; in 93.8% of these cases this was due to the fact that CHPs had identified psychosocial problems in 6.8% of the children with a CBCL total problems score in the normal range. These problems were rated as mild in 60.8% of the cases, moderate in 33.4%, and severe in 5.9%; the CHP rating of children scoring in the clinical range of the CBCL total problems score was 28.0%, 45.8%, and 26.2%, respectively (χ² = 19.03, P < .001).

No actions were taken in 75.4% of all children with a CBCL total problems score in the clinical range; in 93.8% of these cases this was due to the fact that CHPs had identified no psychosocial problems. Referral to another professional was almost 6 times more likely in children with a CBCL total problems score in the clinical range (15.1%) than in those scoring in the normal range (2.6%).

Table 3 presents the association of CBCL problem scales with the identification of and referral for psychosocial problems by CHPs. Identification and referral were 5.4 (95% CI, 3.5-8.5) and 6.5 (95% CI, 3.7-11.5) times more likely in case of an elevated CBCL total problems score, respectively. Looking at CBCL broad-band scales, the ORs were much higher for elevated externalizing scores than for elevated internalizing scores, however, and this was reflected by the associations for the syndrome scales, with ORs being highest for the oppositional and overactive syndromes.

Concerning the sociodemographic variables, Table 4 shows that CHPs identified psychosocial problems relatively frequently in some groups: older children, children of single parents, and children with parents of low educational level. Referral depends on other characteristics, however, being more likely among non-Dutch children and children of parents of low educational level. Factors related to pregnancy and delivery had

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Table 2. Identification of Psychosocial Problems by CHPs and Management Strategies Used in Relation to the CBCL Total Problems Score

<table>
<thead>
<tr>
<th>Variable</th>
<th>Children, Total No. (%)</th>
<th>CBCL Total Problems Score, No. (%) of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of psychosocial problems</td>
<td>169 (8)</td>
<td>132 (7)</td>
</tr>
<tr>
<td>Management strategies‡</td>
<td></td>
<td>37 (29)</td>
</tr>
<tr>
<td>No action</td>
<td>1919 (93)</td>
<td>1824 (94)</td>
</tr>
<tr>
<td>Advice or reassurance</td>
<td>121 (6)</td>
<td>96 (5)</td>
</tr>
<tr>
<td>Follow-up with parents and child</td>
<td>44 (2)</td>
<td>29 (2)</td>
</tr>
<tr>
<td>Consultation with others</td>
<td>23 (1)</td>
<td>12 (1)</td>
</tr>
<tr>
<td>Referral to others</td>
<td>69 (3)</td>
<td>50 (3)</td>
</tr>
<tr>
<td>Any action that implies follow-up</td>
<td>87 (4)</td>
<td>63 (3)</td>
</tr>
</tbody>
</table>

Abbreviations: CBCL, Child Behavior Checklist; CHP, child health professional.

*Non-treated weighted sample (n = 2063). Of the initial sample of 2229 children, 23 were excluded because they were receiving treatment, 1 because problems were not registered, and 142 because of incomplete or missing CBCL data. Because of these exclusions, numbers for the various actions are somewhat lower than in Table 1.

†More than one management strategy per child could be indicated.

Table 3. Results Derived From Multilevel Univariate Logistic Regression Analyses of CBCL Problem Scales Increasing the Probability of Identification and Referral for Psychosocial Problems by CHPs

<table>
<thead>
<tr>
<th>Clinical Range</th>
<th>CBCL Problems Scales</th>
<th>Children, No. (%)</th>
<th>Identification OR (95% CI)</th>
<th>Referral OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total problems</td>
<td>129 (6.3)†</td>
<td>5.40 (3.45-8.47)</td>
<td>6.50 (3.69-11.46)</td>
<td></td>
</tr>
<tr>
<td>Internalizing</td>
<td>136 (6.6)</td>
<td>2.97 (1.82-4.83)</td>
<td>2.53 (1.26-5.07)</td>
<td></td>
</tr>
<tr>
<td>Externalizing</td>
<td>114 (5.5)</td>
<td>7.65 (4.90-11.95)</td>
<td>8.86 (5.08-15.44)</td>
<td></td>
</tr>
<tr>
<td>Oppositional</td>
<td>27 (1.3)</td>
<td>19.77 (8.56-45.65)</td>
<td>17.99 (8.12-39.39)</td>
<td></td>
</tr>
<tr>
<td>Withdrawn/</td>
<td>14 (0.7)</td>
<td>6.40 (2.02-20.29)</td>
<td>4.90 (1.06-22.58)</td>
<td></td>
</tr>
<tr>
<td>Aggressive</td>
<td>28 (1.4)</td>
<td>3.04 (1.16-8.00)</td>
<td>2.18 (0.50-9.42)</td>
<td></td>
</tr>
<tr>
<td>Anxious</td>
<td>19 (0.9)</td>
<td>3.88 (1.31-11.52)</td>
<td>3.44 (0.77-15.33)</td>
<td></td>
</tr>
<tr>
<td>Overactive</td>
<td>13 (0.6)</td>
<td>10.25 (3.45-30.47)</td>
<td>10.06 (2.71-37.32)</td>
<td></td>
</tr>
<tr>
<td>Sleep problems</td>
<td>26 (1.3)</td>
<td>7.04 (3.02-16.40)</td>
<td>5.25 (1.75-15.79)</td>
<td></td>
</tr>
<tr>
<td>Somatic</td>
<td>26 (1.3)</td>
<td>3.83 (1.52-9.68)</td>
<td>1.11 (0.15-8.31)</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: CBCL, Child Behavior Checklist; CHP, child health professional; CI, confidence interval; OR, odds ratio.

*Non-treated sample (n = 2063). Of the initial sample of 2229 children, 23 were excluded because they were receiving treatment, 1 because problems were not registered, and 142 because of incomplete or missing CBCL data. Because of these exclusions, numbers for the various actions are somewhat lower than in Table 1.

†The number of children with a clinical total problems score slightly differs from Table 2 because of the weighting in that table.

no relation with either identification or referral. Finally, parent-reported past treatments for psychosocial problems were significantly related to both the identification of and referral for psychosocial problems.

Table 5 provides the results of multiple logistic regression analyses. It lists those variables that were significantly related to the identification of psychosocial problems by CHPs (in the second column) and to referral for these problems (in the third column) after adjustment for the effect of all other variables. Due to the hierarchical structure of the CBCL scales in which problem items can contribute at the same time to syndrome scales, to the higher-order externalizing and internalizing scales, and to the total problems scale, 3 models were tested for both dependent variables. All models contained the sociodemographic and mental health history variables. Further, the first model contained the total problems scale, the second one contained the broad-band scales, and the third one the CBCL syndrome scales, as far as they univariately had a statistically significant relation with each outcome. These results show that the associations of CBCL and mental history variables with both identification and referral were much stronger than those of sociodemographic variables. Furthermore, the set of variables that predicts referral was much smaller than the one that predicts identification. Finally, day care was associated with less identification after adjustment for the other variables, whereas it was not in the univariate model. Additional variables for all other variables that had been included in Tables 3 and 4 yielded similar results (not shown).

Physicians and nurses working in preventive child health care identified psychosocial problems in 9.4% of the general population of children aged 21 months to 4 years and mostly rated these cases as mild or moderate. The CHPs undertook actions in most of the identified cases of psychosocial problems, mainly by giving advice to parents but relatively frequently also by referring them. Two in 5 of the CHP-identified children were referred for further diagnosis and treatment. Identification of psychosocial problems and subsequent referral were much more likely (3.4 and 6.5 times, respectively) in children with CBCL total problems scores in the clinical range than in other ones. However, CHPs identified no psychosocial problems in most children (71%) with such a score in the clinical range.

Methodologic factors may partially explain why CHPs do not identify all children with parent-reported problems on the CBCL and vice versa, even though the
CBCL is one of the best validated and most widely used parent-report questionnaires to assess psychosocial problems of children. First, CHPs identify a broad range of psychosocial problems, from rather minor behavioral problems to major psychiatric morbidity, whereas high CBCL scores typically occur among children who have been referred to psychiatric services. We thus expect CHPs to identify on the whole less severe problems and at the same time a lot more problems. Interestingly, the latter only partially applies, since CHPs identified problems in 9.4% of all children, whereas 6.4% of all children had a clinical CBCL total problems score. Second, the CBCL/2-3 is an imperfect gold standard. The sensitivity and specificity of the Dutch version at the cutoff for the borderline clinical range are 63% and 84%, respectively, using referral to mental health care as the criterion (OR, 8.720; for the US version, the OR was 9.1). Assuming a true prevalence of problems of 10%, this implies that two out of ten children had problems, because they identified problems somewhat more frequently among these groups, although differences were not statistically significant. On the other hand, parents thought about their child’s problems, which may have led to higher rates of reported problems. Finally, the prevalence of clinical CBCL scores in our sample was somewhat lower than in the Dutch normative sample.20 An explanation may be that the Dutch normative study concerned a relatively small sample (n = 2229 children, 23 were excluded because they were receiving treatment, 1 because problems were not registered, and 142 because of incomplete or missing CBCL data. Other methodologic factors are unlikely to have biased our results significantly. The response in our study was very high (94.7%), and it concerned a representative sample of the Dutch population. Only children living in highly urbanized areas, which included many non-Dutch children, were underrepresented because of the sampling procedure. This may have led to some underestimation of the prevalence of CHP-identified problems, because they identified problems somewhat more frequently among these groups, although differences were not statistically significant. On the other hand, parents filled out the CBCL in advance and were thus forced to think about their child’s problems, which may have lead to higher rates of reported problems. Finally, the prevalence of clinical CBCL scores in our sample was somewhat lower than in the Dutch normative sample. An explanation may be that the Dutch normative study concerned a relatively small sample (n = 420) from one province, including a metropolitan area.20

Table 4. Results Derived From Multilevel Univariate Logistic Regression Analyses of Sociodemographic and (Mental) Health History Variables Increasing the Probability of Identification of and Referral for Psychosocial Problems by CHPs

<table>
<thead>
<tr>
<th>Variable†</th>
<th>Children, No. (%)</th>
<th>Identification</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1047 (50.8)</td>
<td>0.82 (0.60-1.14)</td>
<td>0.74 (0.45-1.20)</td>
</tr>
<tr>
<td>3.5 to 4 y</td>
<td>1070 (51.9)</td>
<td>1.45 (1.05-2.02)</td>
<td>1.15 (0.71-1.86)</td>
</tr>
<tr>
<td>Non-Dutch</td>
<td>71 (3.4)</td>
<td>1.50 (0.70-3.20)</td>
<td>2.85 (1.18-6.86)</td>
</tr>
<tr>
<td>One-parent family</td>
<td>72 (3.5)</td>
<td>3.79 (2.08-6.92)</td>
<td>2.22 (0.86-5.73)</td>
</tr>
<tr>
<td>No siblings</td>
<td>502 (24.3)</td>
<td>1.02 (0.70-1.48)</td>
<td>0.94 (0.53-1.66)</td>
</tr>
<tr>
<td>Medium or high parental educational level</td>
<td>1544 (74.8)</td>
<td>0.45 (0.32-0.64)</td>
<td>0.40 (0.24-0.65)</td>
</tr>
<tr>
<td>Parents employed &lt;16 h/wk</td>
<td>89 (4.3)</td>
<td>1.67 (0.86-3.25)</td>
<td>2.66 (1.18-6.04)</td>
</tr>
<tr>
<td>Very highly urbanized</td>
<td>489 (23.7)</td>
<td>1.27 (0.82-1.96)</td>
<td>1.39 (0.81-2.38)</td>
</tr>
<tr>
<td>Pregnancy duration &lt;37 wk</td>
<td>100 (4.9)</td>
<td>1.19 (0.59-2.43)</td>
<td>0.90 (0.28-2.92)</td>
</tr>
<tr>
<td>Artificial delivery (vacuum, section)</td>
<td>452 (22.6)</td>
<td>0.94 (0.63-1.40)</td>
<td>0.82 (0.45-1.52)</td>
</tr>
<tr>
<td>Birth weight &lt;2500 g</td>
<td>97 (4.7)</td>
<td>1.67 (0.88-3.16)</td>
<td>0.95 (0.29-3.03)</td>
</tr>
<tr>
<td>Hospitalization after birth</td>
<td>297 (14.5)</td>
<td>1.09 (0.69-1.71)</td>
<td>0.78 (0.37-1.66)</td>
</tr>
<tr>
<td>Second and older child</td>
<td>1537 (74.7)</td>
<td>0.99 (0.69-1.44)</td>
<td>1.05 (0.60-1.84)</td>
</tr>
<tr>
<td>Day care</td>
<td>1389 (67.5)</td>
<td>0.86 (0.61-1.21)</td>
<td>0.90 (0.54-1.49)</td>
</tr>
<tr>
<td>(Mental) health history</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past psychological treatment for psychosocial problems</td>
<td>33 (1.6)</td>
<td>17.98 (7.88-36.82)‡</td>
<td>17.00 (7.88-36.69)‡</td>
</tr>
<tr>
<td>Past medical treatment for psychosocial problems</td>
<td>110 (5.3)</td>
<td>11.80 (7.47-18.63)</td>
<td>12.76 (7.46-21.83)</td>
</tr>
<tr>
<td>Past other treatment for psychosocial problems</td>
<td>24 (1.2)</td>
<td>13.25 (5.84-30.03)</td>
<td>16.21 (6.68-39.33)</td>
</tr>
<tr>
<td>Subjected to life event (past year)</td>
<td>1007 (48.8)</td>
<td>1.19 (0.88-1.62)</td>
<td>1.55 (0.95-2.54)</td>
</tr>
<tr>
<td>Parent report of physical illness or handicap</td>
<td>148 (7.2)</td>
<td>1.20 (0.89-1.62)</td>
<td>0.80 (0.29-2.25)</td>
</tr>
<tr>
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<td>1.20 (0.89-1.62)</td>
<td>0.80 (0.29-2.25)</td>
</tr>
</tbody>
</table>

Abbreviations: CHPs, child health professionals; CI, confidence interval; OR, odds ratio.

‡Derived from 1-level model.

*Nontrated sample (n = 2063). Of the initial sample of 2229 children, 23 were excluded because they were receiving treatment, 1 because problems were not registered, and 142 because of incomplete or missing CBCL data.†Reference categories are male; 21 to 27 months; Dutch; 2-parent family; 1 or more siblings; low parental educational level; at least 1 parent working more than 16 hours a week; not or mildly urbanized; 37 weeks and more; normal delivery; 2500 g and over; no hospitalization; first child; and no day care, respectively.
Table 5. Results Derived From Multilevel Multiple Logistic Regression Analyses of Significant Child Factors Increasing the Probability of Identification and Referral for Psychosocial Problems by CHPs

<table>
<thead>
<tr>
<th>Child Factors</th>
<th>Identification</th>
<th>Referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical range CBCL problem scales†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total problems</td>
<td>3.43 (2.04-5.75)</td>
<td>3.74 (1.97-7.13)</td>
</tr>
<tr>
<td>Externalizing</td>
<td>4.88 (2.93-8.14)</td>
<td>4.93 (2.62-9.30)</td>
</tr>
<tr>
<td>Oppositional</td>
<td>9.23 (3.48-24.49)</td>
<td>3.88 (1.31-11.51)</td>
</tr>
<tr>
<td>Overactive</td>
<td>7.16 (1.62-31.54)</td>
<td>...</td>
</tr>
<tr>
<td>Sleep problems</td>
<td>4.85 (1.70-13.83)</td>
<td>...</td>
</tr>
<tr>
<td>Sociodemographic variables‡</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5 to 4 years</td>
<td>1.68 (1.09-2.60)</td>
<td>...</td>
</tr>
<tr>
<td>One-parent family</td>
<td>3.20 (1.63-6.27)</td>
<td>...</td>
</tr>
<tr>
<td>Medium or high parental educational level</td>
<td>0.54 (0.37-0.80)</td>
<td>0.44 (0.26-0.75)</td>
</tr>
<tr>
<td>Day care</td>
<td>0.54 (0.34-0.85)</td>
<td>...</td>
</tr>
<tr>
<td>(Mental) health history variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past psychological treatment for psychosocial problems</td>
<td>8.78 (3.72-20.76)</td>
<td>4.97 (1.93-12.83)</td>
</tr>
<tr>
<td>Past medical treatment for psychosocial problems</td>
<td>8.58 (5.16-14.27)</td>
<td>8.36 (4.53-15.42)</td>
</tr>
</tbody>
</table>

Abbreviations: CBCL, Child Behavior Checklist; CHPs, child health professionals; CI, confidence interval; OR, crude odds ratio.
*Non-treatment sample (n = 2083). Of the initial sample of 2229 children, 23 were excluded because they were receiving treatment, 1 because problems were not registered, and 142 because of incomplete or missing CBCL data. Only those child factors that contribute to the prediction of identification and/or of referral are shown. Child factors that contribute to neither of these 2 are not shown.
†Results regarding CBCL scales refer to 3 different models that all comprise the same sociodemographic variables and mental health history variables but different sets of CBCL variables: one set contains only the total problems scale, one only the externalizing scale, and one only the 3 CBCL syndrome scales. Because the results regarding sociodemographic variables and (mental) health history variables were almost identical, only the ORs of those for the first model (i.e., with adjustment for the total problems scale) are listed in this table.
‡For reference categories, see Table 4.

The prevalence of psychosocial problems is high among preschool- and school-aged children. Early detection and treatment improve the prognosis of these problems. Preventive child health care offers an ideal opportunity for the early detection and subsequent treatment of psychosocial problems. However, evidence on this early detection among preschool children in the general population is lacking. This study shows that psychosocial problems among preschool children are identified frequently by preventive child health care but that many cases of parent-reported problems are missed. Substantial effort should be invested in the improvement of this early detection.
both CHP identification and referral, and this seems to be reinforced with increasing ages. This information can in all likelihood be obtained more easily in older children.

As far as we know our study is one of the first to examine CHP identification of psychosocial problems and subsequent management among preschool children and the first based on a population sample that also comprises children not seeking curative care. In 2 studies conducted in Monroe County, New York, in the late 1970s, Goldberg et al.\(^{28,29}\) found that 3.3% to 3.5% of children aged 1 to 4 years who visited a pediatrician had mental health problems. Starfield et al.\(^{30}\) found that 4.5% to 15% of children aged 1 to 4 years received a psychosocial diagnosis. Finally, Lavigne et al.\(^{5}\) found a rate of pediatrician-identified emotional and behavioral problems similar to ours (9.3%) among children aged 2 to 3 years who visited a pediatrician from the US Pediatric Practice Research Group for any reason. In that study, sensitivity and specificity of pediatrician identification were 20.5% and 92.7%, respectively, using an assessment by a child psychologist as the gold standard. Because our study comprised all children in a general population, our prevalence rates are difficult to compare with these. However, our results regarding accuracy of identification confirm those of Lavigne et al.\(^{5}\) Thus, substantial room exists for improvement in the early detection of psychosocial problems among preschool children. This may, for instance, be reached by the use of short symptom checklists that parents fill out before the assessment;\(^{31}\) training of professionals in the assessment of psychosocial problems, including the use of other informants such as day care providers and a separate developmental assessment to sort out developmental delay as a cause of behavioral problems; and reserving more time per visit. If a child has been referred, another problem may be engaging the child effectively in mental health services, especially if waiting lists are long.\(^{32}\) This makes it even more necessary to refer the children and families who are most in need.

Our results need confirmation in other community-based studies of preschool children, including the use of other criteria as a gold standard for child mental health, in addition to the CBCL. A next step should be the evaluation of various methods to improve early detection and effective early treatment and referral.

Accepted for publication March 12, 2004.

This study was financially supported by the Dutch Ministry of Health, Welfare, and Sports, The Hague, the Netherlands; the Praventiefonds (grant 28-2628-1), The Hague, and Zorg Onderzoek Nederland (grant 101004-12), The Hague.

We thank the personnel of the 16 Dutch child health care services who participated in this study.

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REFERENCES


