

## ORIGINAL ARTICLE

# Maternal recognition of child mental health problems in two Brazilian cities

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**Objective:** To identify child behaviors and types of impairment that increase the likelihood of maternal recognition of emotional/behavioral problems (EBP) in children and adolescents.

**Methods:** Maternal-reported data were obtained from two subsamples of 11-to-16-year-olds derived from cross-sectional studies conducted in two Brazilian municipalities: Itaboraí, state of Rio de Janeiro (n=480), and Embu, state of São Paulo (n=217). The Itaboraí study involved a representative sample of 6-to-16-year-olds (n=1,248; response rate = 86.0%) selected from the Family Health Program registry, which covered 85.5% of the municipal population. The Embu study was based on a probabilistic sample of clusters of eligible households (women aged 15-49 years, child < 18 years), with one mother-child pair selected randomly per household (n=813; response rate = 82.4%). The outcome variable was mother's opinion of whether her child had EBP. Potential correlates included types of child behaviors (hyperactivity/conduct/emotional problems as isolated or combined conditions) and impairment, assessed using the Strengths and Difficulties Questionnaire (SDQ); child's age and gender; maternal education and anxiety/depression (assessed using the Self-Reporting Questionnaire [SRQ]).

**Results:** Multivariate regression models identified the following correlates of maternal perception of child EBP: comorbidity (co-occurring hyperactivity/conduct/emotional problems), emotional problems alone, and interference of problems with classroom learning and friendships.

**Conclusion:** Comorbidity of different problem types, emotional problems alone, and interference with classroom learning and friendships increase the likelihood of maternal recognition of EBP in children.

**Keywords:** Adolescents; child psychiatry; epidemiology; families; community mental health

## Introduction

There are almost 63 million people under age 20 in Brazil.<sup>1</sup> Of these, 8.3 million may have mental health problems, according to the prevalence of DSM-IV disorders (13.1%) found among schoolchildren in a study conducted in four of the five Brazilian regions (n=1,623; 6-16 years; response rate = 81.1%).<sup>2</sup> However, the vast majority of Brazilian children who need mental health assistance do not receive appropriate care, mainly due to provider or system barriers,<sup>3</sup> but also to poor maternal recognition of emotional/behavioral problems (EBP) in their children.<sup>4</sup> In many countries, primary health care is the main setting of mental health treatment for children, who rely on adults such as parents and teachers to identify their problems and initiate service use.<sup>5</sup>

In Brazil, the Unified Health System provides universal access to health services for the entire Brazilian population. However, child and adolescent mental health services are still scarce. Specialized public services (Psychosocial

Community Care Centers for Children and Adolescents) exist to assist severe cases, but are insufficient in number and distributed unequally within the country.<sup>6</sup> Therefore, when parents decide to seek treatment or support for their children with mental health problems, primary care facilities rather than specialized services are the main source of help, particularly among more disadvantaged populations.

Parents are more likely to report intentions to seek help or use services when they recognize a problem in their children.<sup>7,8</sup> Therefore, parental perception of mental health problems in their children is the first of several stages toward children receiving appropriate care, followed by seeking support from primary care services, recognition within primary care, and referral to specialized health services.<sup>5</sup> Parental perception is thus critical to improving access to treatment and avoiding escalation and perpetuation of problems into adult life, which may compromise individuals' functioning and wellbeing, putting them at risk of unemployment and social exclusion.<sup>9</sup> However, parental perception of child problems is not only influenced by child psychopathology<sup>7,10</sup> and functional impairment but also by other factors, such as the child's age and gender, maternal education, and maternal depression.<sup>11</sup> With increasing age, children's own perception of their functioning becomes increasingly important as a motive

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for seeking help.<sup>10</sup> Help is more often sought for boys during childhood and for girls during adolescence,<sup>12</sup> which is consistent with the higher prevalence of hyperactivity and conduct problems in young boys and depression in adolescent girls.<sup>13</sup>

Within this context, the present study aims to identify specific child behavior profiles and types of impairment identified by mothers that increase the likelihood of maternal recognition of EBP in their children, taking into account other potential correlates.

## Methods

### *Study design and setting*

Cross-sectional studies were conducted in two low-income municipalities of Southeast Brazil, both located in the greater metropolitan area of state capitals: Itaboraí, state of Rio de Janeiro (population 218,008 in 2010,<sup>14</sup> located 40 km from the state capital Rio de Janeiro) and Embu, state of São Paulo (population 207,663 in 2000,<sup>15</sup> located 24.5 km from the state capital São Paulo).

### *Sampling*

The original Itaboraí study (2009-2010) included a sample of 6-to-16-year-olds ( $n=1,248$ ; response rate = 86.0%) randomly selected from the Family Health Program (FHP) registry. The FHP, adopted as a nationwide policy in the 1990s, is a strategy for reorganizing primary care in order to increase public access to health care. According to official information from the Itaboraí municipal government, 85.5% of the population was covered by FHP units in 2010.<sup>16</sup> Each unit was composed of one or two teams, with each team including a physician, a nurse, and around six community health workers responsible for making home visits to registered families. In 2009, 44 FHP teams were active in Itaboraí, 31 of which (70.5%) were involved in the study. For each team, 45 to 48 eligible families (having at least one child aged 6-16 years) were randomly selected, depending on the number of community health workers in the team. The selection of teams was based on the location of units, which were stratified according to the level of neighborhood violence: low violence (7/7 teams, 100%), high violence (13/14 teams, 92.9%), and intermediate violence (11/23 teams, 47.8%).

In Itaboraí, a three-stage sampling plan was applied. The first stage was determined by the level of violence (low, intermediate, high) in each neighborhood served by an FHP unit; these three geographical areas were based on census units. In areas with low and high levels of violence, all units were invited to participate, with 7/7 (100.0%) and 13/14 (92.9%) acceptance respectively. In the intermediate-violence area, 11/23 (47.8%) units were randomly selected to enter the study. The second stage was to conduct a random selection of families among all eligible families registered with the participating FHP units in each of the three geographical areas (low: 454/3,859, intermediate: 307/2,041, high: 487/4,061). The third stage was to randomly select a child among all eligible children in each participating family, in each of the three

geographical areas (low: 1/1.70, intermediate: 1/1.55, high: 1/1.62).

The sample size of the original Itaboraí study ( $n=1,276$ ) was calculated on the basis of the minimum expected prevalence (7%) of its primary outcome (use of mental health services in the past 12 months by children with moderate/severe mental health problems), with an adopted relative precision of 20% (5.6-8.4%).<sup>17</sup>

The original Embu study (2001-2002) was conducted in a community in which the participant municipal health center was located. Based on census units, 24 clusters (geographic areas of maximum internal homogeneity and similar size) in the area were selected randomly. In these clusters, all eligible households were identified (residences in which a woman aged 15-49 years lived with at least one of her children < 18 years), and one mother-child pair was selected randomly per household. From this initial selection ( $n=987$ ), 813 mothers participated in the study (response rate = 82.4%).

In Embu, mothers from all eligible households located in the randomly selected clusters (24/60) were invited to participate in the study. The mean number of eligible children in the participant households was two. The sample size of the original Embu study ( $n=864$ ) was calculated on the basis of the expected prevalence (10%) of its primary outcome (child exposed to severe physical punishment), with an adopted relative precision of 20% (8.0-12.0%).<sup>17</sup>

### *Participants*

The present study was restricted to 11-to-16-year-olds from Itaboraí ( $n=480$ ) and Embu ( $n=217$ ) for whom complete data on the variables of interest were available, based on reports by (biological, adoptive, or step) mothers. In Itaboraí, 201 of 681 11-to-16-year-olds were excluded because the informant was not the mother ( $n=157$ ), because the child had severe mental retardation ( $n=4$ ), or because of missing data ( $n=40$ ). In Embu, 10 of 227 11-to-16-year-olds were excluded due to missing data; none had severe retardation, and the informant was the mother in all cases.

### *Variables and instruments*

Both the Itaboraí and Embu studies collected information on the outcome variable (mother's opinion of whether her child had EBP) and potential correlates (different types of child behavior profiles and impairment, child's age and gender, and maternal education). Maternal opinion was assessed by the following question: "Do you think <name of index child> has emotional or behavioral problems?" Maternal reports about their child's specific behavior profiles were then measured on the Strengths and Difficulties Questionnaire (SDQ), a widely used screening instrument with good psychometric properties.<sup>18,19</sup> The SDQ was developed by Goodman<sup>18</sup> and validated in Brazil by Fleitlich-Bilyk & Goodman.<sup>20</sup> The SDQ was used to identify children with clinical-level conduct problems, emotional problems, and hyperactivity, according to maternal reports (cutoff points defined clinical levels as

detailed at [www.sdqinfo.com](http://www.sdqinfo.com)). The SDQ was also used to identify impairments arising from those problems (child distress and interference with home life, friendships, classroom learning, and leisure activities), and scored positive when mothers reported “quite a lot/a great deal” of impact on children’s functioning (versus “only a little/not at all”). Data on maternal anxiety/depression was obtained, only in Embu, using the Self-Reporting Questionnaire (SRQ-20), a screening measure developed by the World Health Organization with a total score ranging from 0 to 20.<sup>21</sup> The SRQ-20 was validated for the Brazilian population with a cutoff point  $> 7$ .<sup>22</sup>

### Procedures

All interviews were conducted in the child’s household (in Itaboraí) or at the local health center (in Embu). All questions were asked verbally. For both subsamples of 11-to-16-year-olds, all interviewees were mothers, the great majority of whom were biological mothers (Itaboraí: 98.1%, Embu: 99.1%). In both studies, the question on the mother’s opinion about her child’s EBPs was asked before completion of the SDQ.

### Statistical analysis

Chi-square tests identified significant differences between groups. A significance level of  $p < 0.001$  was adopted due to the multiple tests conducted. All child and mother factors potentially associated with maternal recognition of child EBPs were entered into logistic regression models to estimate unadjusted and adjusted odds ratios (univariate and multivariate analysis respectively). Sampling weights applied to data analysis were calculated on the basis of the study sampling plan. In this paper, unweighted numbers of subjects are presented, but percentages are weighted to generate frequencies representative of the population of same-age children and adolescents living in Itaboraí and Embu.

### Ethics approval

The Research Ethics Committee of Universidade Federal de São Paulo approved the Itaboraí study (process number 0601/09) and the Embu study (process number 0740/02). Written informed consent was obtained from all participating mothers.

### Results

Table 1 reports the characteristics of children/adolescents and mothers in the Itaboraí and Embu samples. Table 2 shows the types of clinical-level mental health problems in each sample, occurring either alone or with other types (comorbidity). Clinical-level conduct problems were mostly comorbid in Itaboraí (71.4%) and in Embu (78.9%). Clinical-level hyperactivity was also mostly comorbid in Itaboraí (83.4%) and in Embu (72.2%). Clinical-level emotional problems occurred combined with conduct/hyperactivity problems in a slightly higher proportion than

alone in Itaboraí (55.7% vs. 44.3%), but occurred mostly alone in Embu (78.6%) (Table 2).

Among children with conduct problems alone, some 50% in both samples were not perceived as having emotional/behavioral difficulties by their mothers (Table 3). This lack of maternal recognition of problems also applied to about 70% of children with emotional problems alone in both studies, and to the majority of children with hyperactivity alone in Itaboraí (83.4%) and in Embu (60.0%). In both studies, children with emotional problems alone and comorbidity were significantly more likely to be perceived by their mothers as having EBPs, compared to children with no mental health problems (Table 3). In Itaboraí, maternal recognition of problems was much more common among children with comorbidity than among children with emotional problems alone or hyperactivity alone ( $p < 0.005$ ), but children with conduct problems alone and children with comorbidity were similarly recognized by mothers as “problematic.” In Embu, no differences in maternal perception were found among the four categories of problems.

Univariate regression analysis showed the strength of association between each potential correlate and the study outcome (Table 4). It is interesting to note that the high effect size of all impairment components was drastically reduced in multivariate models (Table 5), confirming the existence of multiple associations within this group of variables. Multivariate regression models showed that, in both studies, comorbidity, clinical-level emotional problems alone, and problems’ interference with classroom learning were independent correlates of mothers perceiving their children as “problematic,” adjusting for other potential correlates (Table 5). These factors were significant correlates in the presence of maternal anxiety/depression (Embu model 2). Comorbidity was a stronger correlate than isolated conditions across both studies. In Itaboraí, conduct problems alone were more influential than emotional problems alone, but in Embu, the opposite was noted. In Itaboraí, male gender, child distress, and interference with leisure activities were also significant correlates (Table 5). In Embu model 2, interference with leisure activities was a significant correlate, but in the opposite direction, which may be explained by collinearity with “child distress” (of the five subjects positive for interference with leisure activities, four were positive for child distress). When excluding interference with leisure activities from the Embu models, interference with friendships remained non-significant in model 1 (odds ratio [OR] = 2.25; 95%CI 0.53-9.48) and lost significance in model 2 (OR = 2.92; 95%CI 0.61-14.04).

### Discussion

According to the Grand Challenges in Global Mental Health initiative, improvement of children’s access to evidence-based care by trained health providers in low- and middle-income countries is one of the top five challenges to improve the lives of people living with mental, neurological, and substance-use disorders.<sup>23</sup> According to Patel et al.,<sup>24</sup> the

**Table 1** Characteristics of 11-to-16-year olds and mothers from two samples: Itaboraí, state of Rio de Janeiro (2009-2010), and Embu, state of São Paulo (2001-2002), Brazil\*

Sample characteristics	Itaboraí n=480	Embu n=217
<b>Adolescents</b>		
Gender		
Male	237 (49.0)	99 (45.6)
Female	243 (51.0)	118 (54.4)
<b>Maternal reports of mental health problems (SDQ)</b>		
Conduct problems		
Clinical	163 (35.1)	19 (8.8)
Borderline/normal	317 (64.9)	198 (91.2)
Emotional problems		
Clinical	224 (45.9)	56 (25.8)
Borderline/normal	256 (54.1)	161 (74.2)
Hyperactivity		
Clinical	86 (17.8)	18 (8.3)
Borderline/normal	394 (82.2)	199 (91.7)
<b>Maternal reports of impairment components (SDQ)</b>		
Child distress		
Quite a lot/a great deal	54 (11.5)	11 (5.1)
Only a little/not at all	426 (88.5)	206 (94.9)
Interference with home life		
Quite a lot/a great deal	45 (10.3)	7 (3.2)
Only a little/not at all	435 (89.7)	210 (96.8)
Interference with friendships		
Quite a lot/a great deal	27 (6.1)	7 (3.2)
Only a little/not at all	453 (93.9)	210 (96.8)
Interference with classroom learning		
Quite a lot/a great deal	76 (17.0)	14 (6.5)
Only a little/not at all	404 (83.0)	203 (93.5)
Interference with leisure activities		
Quite a lot/a great deal	19 (3.8)	5 (2.3)
Only a little/not at all	461 (96.2)	212 (97.7)
Any impairment		
Yes	113 (25.1)	21 (9.7)
No	367 (74.9)	196 (90.3)
<b>Mothers</b>		
Education (years)		
0-4	157 (31.3)	78 (35.9)
5 or more	323 (68.7)	139 (64.1)
Anxiety/depression (SRQ-20)		
Yes (> 7)	N/A <sup>†</sup>	74 (34.1)
No (0-7)	N/A <sup>†</sup>	143 (65.9)
Opinion about child's mental health status		
Emotional/behavioral problems	172 (36.3)	44 (20.3)
No emotional/behavioral problems	308 (63.7)	173 (79.7)

Data presented as n (%).

N/A = not applicable; SDQ = Strengths and Difficulties Questionnaire; SRQ-20 = Self-Reporting Questionnaire.

\* Numbers of subjects are unweighted (refer to the sample) and all percentages are weighted, representing frequencies in the population of 11-to-16-year-olds from Itaboraí and Embu.

<sup>†</sup> Not applicable (variable not included in the Itaboraí study).

most viable strategy to address the treatment gap is through empowerment of existing human resources that are most intimately concerned with child care, including empowerment of parents.

In the present study, even when mothers reported child symptoms on the SDQ that indicated clinical-level conduct problems, emotional problems, or hyperactivity, mothers often did not perceive their child as having an EBP. This lack of maternal recognition is in accordance with a previous U.S. study, which found that, in a sample of children with mental disorders, only 39% of parents perceived their child to have a mental health problem.<sup>11</sup>

Nonetheless, in Itaboraí and Embu, children with conduct problems alone, emotional problems alone, and

comorbidity were significantly more likely to be perceived by their mothers as having EBPs, compared to children with no problems. This is consistent with a previous study in the Netherlands<sup>25</sup> that found an association between parents perceiving their children as having EBPs and children's mental health problems indicated both by a screening questionnaire (Child Behavior Checklist/6-18) and by a diagnostic instrument (Diagnostic Interview Schedule for Children, IV).

In our investigation, multivariate models identified specific types of child behavior profiles and impairment that correlated independently with the mother's opinion of whether the child had any EBPs. The implications of these findings are discussed in turn.

**Table 2** Clinical-level mental health problems (SDQ) occurring alone or concomitantly in two samples of 11-to-16-year-olds: Itaboraí, state of Rio de Janeiro (2009-2010), and Embu, state of São Paulo (2001-2002), Brazil\*

Clinical-level problems (SDQ, mother's report)	Itaboraí n=480	Embu n=217
Conduct		
Alone	45 (28.6)	4 (21.1)
Combined with hyperactivity/emotional	118 (71.4)	15 (78.9)
Any clinical-level conduct problems	163 (100.0)	19 (100.0)
Emotional		
Alone	101 (44.3)	44 (78.6)
Combined with hyperactivity/conduct	123 (55.7)	12 (21.4)
Any clinical-level emotional problems	224 (100.0)	56 (100.0)
Hyperactivity		
Alone	11 (16.6)	5 (27.8)
Combined with conduct/emotional	75 (83.4)	13 (72.2)
Any clinical-level hyperactivity	86 (100.0)	18 (100.0)

Data presented as n (%).

SDQ = Strengths and Difficulties Questionnaire.

\* Numbers of subjects are unweighted (refer to the sample) and all percentages are weighted, representing frequencies in the population of 11-to-16-year-olds from Itaboraí and Embu.

**Table 3** Mothers perceiving emotional/behavioral problems in their children, stratified maternal reporting of isolated vs. combined clinical-level problems (SDQ): rates in Itaboraí, state of Rio de Janeiro, and Embu, state of São Paulo, Brazil\*

Clinical-level problems (SDQ, mother's report)	Itaboraí		Embu	
	Problems n=172	No problems n=308	Problems n=44	No problems n=173
None (reference category)	21 (11.1)	164 (88.9)	16 (11.0)	129 (89.0)
Conduct problems alone	21 (50.3) <sup>†</sup>	24 (49.7)	2 (50.0)	2 (50.0)
Emotional problems alone	31 (30.5) <sup>‡</sup>	70 (69.5)	13 (29.5) <sup>†</sup>	31 (70.5)
Hyperactivity alone	2 (16.6)	9 (83.4)	2 (40.0)	3 (60.0)
Comorbidity <sup>‡</sup>	97 (70.7) <sup>†</sup>	41 (29.3)	11 (57.9) <sup>†</sup>	8 (42.1)

Data presented as n (%).

SDQ = Strengths and Difficulties Questionnaire.

\* Numbers of subjects are unweighted (refer to the sample) and all percentages are weighted (refer to the population).

<sup>†</sup>  $p < 0.001$  in chi-square tests with none as reference category.

<sup>‡</sup> Co-occurrence of two or three problems (conduct, emotional, hyperactivity).

### Problem type

Comorbidity was a stronger predictor of mothers perceiving their child as having an emotional/behavioral difficulty compared to isolated conditions, which is consistent with a recent Brazilian study examining the capacity of teachers to identify students in need of mental health evaluation/treatment.<sup>26</sup>

One interpretation of the finding that, in Itaboraí, conduct problems alone had a stronger association with mothers' perception of child EBPs compared to emotional problems alone might be that externalizing behaviors are particularly distressing for parents and, therefore, children with externalizing behaviors are more frequently perceived as "problematic" than children with internalizing problems.<sup>27,28</sup> Hankinson<sup>28</sup> examined thresholds for parents' perceptions of children's problems and subsequent help-seeking decisions based on children's behaviors presented in vignettes. Externalizing behaviors alone were rated by parents as more serious and representing a greater need for treatment than internalizing behaviors alone. As such, mothers may have a lower

threshold for identifying externalizing symptoms as "problematic" than for internalizing symptoms, which may be less noticeable.<sup>29</sup> Furthermore, conduct problems alone in the Embu sample were not a significant correlate of mothers' perception of child EBPs, probably due to the low number of these problems observed.

### Impact of problems

In both studies, children's problems interfering with classroom learning was associated with mothers' perceptions of their child having an emotional/behavioral problem, independently of the presence of child psychopathology identified by clinical-level SDQ scales, other types of impact, maternal anxiety/depression, or demographic variables. This is consistent with findings from a general-population sample of Dutch 4-to-18-year-olds in which academic problems were strongly associated with perceived mental health service need and utilization, independently of child internalizing and externalizing behaviors or family stress.<sup>10</sup> A review of influences on the help-seeking

**Table 4** Correlates of maternal opinion about child emotional/behavioral problems, identified by univariate logistic regression models, in two samples of 11-to-16-year-olds: Itaboraí, state of Rio de Janeiro, and Embu, state of São Paulo, Brazil\*

Sample characteristics	Itaboraí n=480		Embu n=217	
	Unadjusted OR (95%CI)	p-value	Unadjusted OR (95%CI)	p-value
<b>Adolescents</b>				
Age (years)	1.02 (0.95-1.09)	0.649	1.06 (0.91-1.23)	0.442
Gender (male vs. female)	<b>1.66 (1.21-2.29)</b>	<b>0.030</b>	0.70 (0.43-1.13)	0.133
Clinical-level problems (SDQ, mother's report)				
Conduct problems alone <sup>†</sup>	<b>8.13 (4.23-15.64)</b>	<b>&lt; 0.001</b>	<b>8.06 (1.66-39.15)</b>	<b>0.012</b>
Emotional problems alone <sup>†</sup>	<b>3.53 (2.07-6.02)</b>	<b>&lt; 0.001</b>	<b>3.38 (1.83-6.25)</b>	<b>&lt; 0.001</b>
Hyperactivity alone <sup>†</sup>	1.60 (0.38-6.79)	0.510	<b>5.38 (1.21-23.87)</b>	<b>0.029</b>
Comorbidity <sup>†</sup>	<b>19.45 (13.52-27.97)</b>	<b>&lt; 0.001</b>	<b>11.09 (4.24-29.00)</b>	<b>&lt; 0.001</b>
<b>Impairment components (SDQ, mother's report)</b>				
Child distress <sup>‡</sup>	<b>25.99 (11.21-60.24)</b>	<b>&lt; 0.001</b>	<b>3.57 (1.28-9.97)</b>	<b>0.017</b>
Interference with home life <sup>‡</sup>	<b>10.50 (5.13-21.51)</b>	<b>&lt; 0.001</b>	<b>3.09 (1.04-9.18)</b>	<b>0.043</b>
Interference with friendships <sup>‡</sup>	<b>23.45 (9.35-58.81)</b>	<b>&lt; 0.001</b>	<b>5.67 (1.72-18.66)</b>	<b>0.006</b>
Interference with classroom learning <sup>‡</sup>	<b>16.42 (9.67-27.86)</b>	<b>&lt; 0.001</b>	<b>6.19 (2.98-12.84)</b>	<b>&lt; 0.001</b>
Interference with leisure activities <sup>‡</sup>	<b>20.92 (12.40-35.32)</b>	<b>&lt; 0.001</b>	0.98 (0.15-6.39)	0.985
<b>Mothers</b>				
Education (0-4 years vs. > 4 years)	<b>1.32 (1.02-1.72)</b>	<b>0.037</b>	1.02 (0.68-1.54)	0.910
Anxiety/depression (SRQ-20) <sup>§</sup>	N/A <sup>  </sup>		<b>3.33 (1.98-5.61)</b>	<b>&lt; 0.001</b>

Bold font indicates significant results.

95%CI = 95% confidence interval; N/A = not applicable; OR = odds ratio; SDQ = Strengths and Difficulties Questionnaire; SRQ-20 = Self-Reporting Questionnaire.

\* Sampling weights applied to determine unadjusted OR and 95%CI.

<sup>†</sup> Compared to no problems on SDQ.

<sup>‡</sup> Quite a lot/a great deal vs. only a little/not at all.

<sup>§</sup> Yes (total score > 7) vs. no (total score 0-7).

<sup>||</sup> Not applicable (variable not measured in the Itaboraí study).

process concluded that school-related problems play an important role, influencing not only parental help-seeking but also problem recognition by general practitioners.<sup>12</sup> In the Itaboraí sample, interference with friendships was also interpreted by mothers as a red flag of child EBPs. This is in accordance with Brazilian cultural norms, which expect children to be very social. In Embu, interference with friendships was not a significant correlate of mothers' perception of child EBPs in model 1 and lost significance in model 2 when the variable "interference with leisure activities" was excluded from the model due to collinearity with "child distress." This lack of significance is probably due to the low number of subjects classified as having "quite a lot/a great deal" of interference with leisure activities in the Embu sample.

#### Child gender

In the Itaboraí sample, mothers were more likely to perceive EBPs in their children when the child was a boy, independently of clinical-level problems and impairment. These results are in agreement with a Brazilian study that examined a probabilistic sample of schoolchildren (n=1,721; grades 2-6) and identified female gender as a correlate of low mental health service utilization in the presence of psychiatric disorders and/or neurodevelopmental problems.<sup>30</sup> However, in Embu, gender was not a correlate of maternal perception of children's problems. This inconsistency in findings across sites might be explained by an association of gender with variables not measured in our study that may have differed between

sites. For example, our study did not include correlates of antisocial behavior (e.g., alcohol/illicit drug use<sup>31</sup> and involvement with criminality<sup>32</sup>), which are predominant in males compared to females, and are signs of severity that may make mothers more likely to recognize their child as having EBPs. If alcohol/illicit drug use and involvement with criminality were more common in Itaboraí than in Embu, this could explain why male gender was associated with maternal recognition of children's problems in the former but not in the latter. This hypothesis is coherent with the fact that, in 2006, Itaboraí recorded a higher homicide rate among adolescents (6.0 deaths per 1,000 in the age range 12-18 years) compared to Embu (2.8 deaths per 1,000 in the same age range).<sup>33</sup>

#### Parental psychopathology

Parental recognition of children's problems partly depends on levels of distress or burden experienced by the parents in raising their child.<sup>12,34</sup> Parental distress reduces the threshold for parents perceiving their children's behaviors as "problematic."<sup>10,29,35,36</sup> Also, high levels of stress reduce parental self-efficacy to cope with parenting demands and other daily challenges, making parents more likely to seek help from pediatric primary care services.<sup>37</sup> Because parental distress and below-average self-efficacy in high-stress environments are associated with perceiving children as having problems, it is reasonable to hypothesize that mothers with anxiety/depression would be more likely to perceive their sons/daughters as having EBPs.

**Table 5** Correlates of maternal opinion about child emotional/behavioral problems, identified by multivariate logistic regression models, in two samples of 11-to-16-year-olds: Itaboraí, state of Rio de Janeiro, and Embu, state of São Paulo, Brazil\*

Sample characteristics	Itaboraí n=480				Embu n=217			
	Model 1		Model 1 (excluding maternal anxiety/depression)		Model 2 (including maternal anxiety/depression)		Model 2 (including maternal anxiety/depression)	
	Adjusted OR (95%CI)	p-value	Adjusted OR (95%CI)	p-value	Adjusted OR (95%CI)	p-value	Adjusted OR (95%CI)	p-value
<b>Adolescents</b>								
Age (years)	1.04 (0.96-1.13)	0.320	1.04 (0.88-1.21)	0.651	1.01 (0.86-1.19)	0.884	1.01 (0.86-1.19)	0.884
Gender (male vs. female)	<b>1.94 (1.39-2.71)</b>	< <b>0.001</b>	0.70 (0.42-1.19)	0.176	0.70 (0.41-1.19)	0.175	0.70 (0.41-1.19)	0.175
Clinical-level problems (SDQ, mother's report)								
Conduct problems alone <sup>†</sup>	<b>6.52 (3.39-12.53)</b>	< <b>0.001</b>	4.92 (0.96-25.14)	0.055	4.97 (0.80-30.93)	0.083	4.97 (0.80-30.93)	0.083
Emotional problems alone <sup>†</sup>	<b>2.19 (1.29-3.71)</b>	<b>0.005</b>	<b>2.69 (1.49-4.85)</b>	<b>0.002</b>	<b>2.09 (1.10-3.99)</b>	<b>0.027</b>	<b>2.09 (1.10-3.99)</b>	<b>0.027</b>
Hyperactivity alone <sup>†</sup>	1.35 (0.44-4.12)	0.588	3.42 (0.62-18.69)	0.149	2.10 (0.44-9.99)	0.337	2.10 (0.44-9.99)	0.337
Comorbidity <sup>†</sup>	<b>11.11 (7.18-17.17)</b>	< <b>0.001</b>	<b>10.69 (3.56-32.12)</b>	< <b>0.001</b>	<b>7.80 (2.45-24.90)</b>	<b>0.001</b>	<b>7.80 (2.45-24.90)</b>	<b>0.001</b>
<b>Impairment components (SDQ, mother's report)</b>								
Child distress <sup>‡</sup>	<b>13.08 (6.03-28.37)</b>	< <b>0.001</b>	1.18 (0.42-3.27)	0.746	1.02 (0.40-2.62)	0.969	1.02 (0.40-2.62)	0.969
Interference with home life <sup>‡</sup>	0.93 (0.45-1.94)	0.847	1.93 (0.56-6.61)	0.282	1.96 (0.55-7.01)	0.285	1.96 (0.55-7.01)	0.285
Interference with friendships <sup>‡</sup>	<b>4.20 (1.16-15.21)</b>	0.030	4.50 (0.68-29.81)	0.113	<b>6.89 (1.16-40.79)</b>	<b>0.035</b>	<b>6.89 (1.16-40.79)</b>	<b>0.035</b>
Interference with classroom learning <sup>‡</sup>	<b>4.65 (2.32-9.33)</b>	< <b>0.001</b>	<b>3.31 (1.39-7.90)</b>	<b>0.009</b>	<b>3.81 (1.73-8.39)</b>	<b>0.002</b>	<b>3.81 (1.73-8.39)</b>	<b>0.002</b>
Interference with leisure activities <sup>‡</sup>	<b>2.62 (1.26-5.45)</b>	0.012	0.08 (0.01-1.05)	0.054	<b>0.06 (0.01-0.56)</b>	<b>0.015</b>	<b>0.06 (0.01-0.56)</b>	<b>0.015</b>
<b>Mothers</b>								
Education (0-4 vs. > 4 years)	1.06 (0.75-1.48)	0.745	0.95 (0.57-1.57)	0.818	0.66 (0.36-1.22)	0.175	0.66 (0.36-1.22)	0.175
Anxiety/depression (SRQ-20) <sup>§</sup>	N/A <sup>  </sup>		VEP <sup>¶</sup>		<b>2.84 (1.36-5.91)</b>	<b>0.007</b>	<b>2.84 (1.36-5.91)</b>	<b>0.007</b>

Bold font indicates significant results.

95%CI = 95% confidence interval; N/A = not applicable; OR = odds ratio; SDQ = Strengths and Difficulties Questionnaire; SRQ-20 = Self-Reporting Questionnaire; VEP = variable excluded on purpose.

\* Sampling weights applied to determine adjusted OR and 95% CI.

† Compared to no problems on SDQ.

‡ Quite a lot/a great deal vs. only a little/not at all.

§ Yes (total score > 7) vs. no (total score 0-7).

|| Not applicable (variable not measured in the Itaboraí study).

¶ Variable excluded from Embu model 1 on purpose to make it comparable to Itaboraí model 1.

## Conclusion

In conclusion, this study contributed new evidence on isolated and combined types of child behavior profiles in relation to maternal perception of children's EBPs. It emphasized the strong role of comorbidity in increasing the likelihood of a mother's recognition of her child as "problematic." Our study also contributed new evidence on the specific types of impairment that are related to maternal perception of children's problems, highlighting the particular importance of impaired school performance and problem interference with friendships, instead of using only one measure of global functioning. Our findings are probably generalizable to other disadvantaged Brazilian populations living in similar socioeconomic contexts. However, the study has limitations, such as the small number of children with conduct problems alone in the Embu sample and with hyperactivity alone in both samples, which reduced statistical power to find significant associations between these isolated conditions and the study outcome. Other limitations include the absence of other relevant potential correlates (e.g., maternal beliefs/ understanding about mental illness, signs of severity of child antisocial behavior such as alcohol/illicit drug use and criminality) and the lack of an independent assessment of whether the children actually had mental health problems, since only a screening instrument (SDQ) was completed by the mothers. Because the study outcome (mother's opinion of whether her child had EBPs) and main independent variables of interest (types of child behaviors and impairment) were measured on the basis of information provided by the same respondent, this data relationship may have influenced the study results. Nevertheless, while this last factor may be seen as a limitation, it also provides an interesting perspective on our results, because the mothers in this study did not always perceive their child as having problems even when they noticed symptoms (as reported on the SDQ).

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## Disclosure

The authors report no conflicts of interest.

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