

Behavioral and emotional problems of schoolchildren according to genderⁱ

Adriana Martins Saur^I

Sonia Regina Loureiro^{II}

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ABSTRACT

The aim of this study was to investigate mental health problems, including behavioral and emotional problems, in a cohort of schoolchildren according to gender and to assess the associations of family characteristics and behavioral performance for boys and girls. Data from 677 children born in Ribeirão Preto (SP), Brazil, when they were 10/11 years old was available. The mental health assessment was performed using the Brazilian version of the Strengths and Difficulties Questionnaire. Results showed that the prevalence rates for boys and girls were, respectively: 41.7% and 34.5% for total difficulties score, 50.4% and 57.6% for emotional symptoms, 31.2% and 18.8% for hyperactivity, 38.8% and 27.6% for conduct problems, 27.1% and 26.7% for peer problems and, 4.7% and 2.7% for prosocial behavior. The family characteristics associated with behavioral problems were low socioeconomic status for boys and low maternal education and families with more than four members for girls.

Keywords: Mental health; Child behavior; Gender and health; Cohort studies.

Problemas comportamentais e emocionais de escolares segundo o gênero

RESUMO

O presente estudo investigou problemas de saúde mental, incluindo problemas comportamentais e emocionais, em uma coorte de crianças em idade escolar diferenciadas pelo gênero e avaliou as possíveis associações entre características familiares e desempenho comportamental. Foram avaliadas 677 crianças nascidas em Ribeirão Preto (SP), Brasil, aos 10/11 anos de idade. Para a avaliação da saúde mental utilizou-se a versão brasileira do Questionário de Capacidades e Dificuldades. As taxas de prevalência para meninos e meninas foram, respectivamente: 41,7% e 34,5% para o escore total de dificuldades, 50,4% e 57,6% para sintomas emocionais, 31,2% e 18,8% para hiperatividade, 38,8% e 27,6% para problemas de conduta, 27,1 % e 26,7% para problemas de relacionamento e 4,7% e 2,7% para comportamento pró-social. As características familiares associadas a problemas comportamentais foram baixo nível socioeconômico para os meninos e baixa escolaridade materna e famílias mais numerosas para as meninas.

Palavras-chave: Saúde mental; Comportamento infantil; Gênero e saúde; Estudos de coortes.

Problemas comportamentais y emocionales de niños según el género

RESUMEN

El presente estudio tuvo como objetivo investigar problemas de salud mental, incluyendo problemas comportamentales y emocionales, en una cohorte de niños en edad escolar diferenciados por género, y evaluar las posibles asociaciones entre características familiares y el desempeño comportamental. Se evaluaron 677 niños nacidos en Ribeirão Preto (SP), Brasil, con 10/11 años de edad. Para la evaluación de la salud mental se utilizó la versión brasileña del Cuestionario de Capacidades y Dificultades. Las tasas de prevalencia de problemas comportamentales para niños y niñas fueron, respectivamente: el 41,7% y el 57,6% para síntomas emocionales, el 31,2% y el 18,8% para hiperactividad, el 38,8% y el 27,6% para problemas de conducta, el 27,1% y el 26,7% para problemas de relacionamiento y el 4,7% y el 2,7% para comportamiento pro-social. Las características familiares asociadas a problemas comportamentales fueron el bajo nivel socioeconómico para los niños y la baja escolaridad materna y familias más numerosas para las niñas.

Palabras clave: Salud mental; Conducta infantil; Género y salud; Estudios de cohortes.

Introduction

Knowledge of child mental health disorders is important not only because they result in suffering for children and those around the children, but also because they interfere with social and educational development and can lead to life-long social and psychiatric problems (Rutter, 1996). There is little consensus on the extent to which manifestations of psychiatric symptoms are universal or the extent to which they can be affected by cultural aspects. However, since studies have found prevalence rates to vary all over the world, it seems necessary to consider culture and context in determining the way in which children's psychopathology may be manifested (Canino & Alegria, 2008; R. Hackett & L. Hackett, 1999; Roberts, Attkisson, & Rosenblatt, 1998). There is also evidence that child disorders may vary between developed and developing countries, making it necessary to distinguish studies by each country, as well (Fleitlich-Bilyk & Goodman, 2004; R. Hackett & L. Hackett, 1999). In fact, a major gap in the epidemiology of child mental disorders has been considered the lack of studies regarding the data on the prevalence rates in low-middle income countries (Kieling et al., 2011; Rohde, 2011).

Epidemiological studies and investigations about child mental health problems indicate that the prevalence of child psychiatric disorders in the developed world is between 10% and 20%, with a global mean of 15.8% (Kieling et al., 2011; Ravens-Sieberer et al., 2008; Roberts et al., 1998; Skovgaard et al., 2008). In the developing world, where children and adolescents form a higher proportion of the population, the prevalence can be higher, reaching rates of mental health problems up to 50% (Bhola & Kapur, 2003; Fleitlich-Bilyk & Goodman, 2004; Giel et al., 1981; R. Hackett, L. Hackett, Bhakta, & Gowers, 1999; Mullick & Goodman, 2001; Prior, Virasinghe, & Smart,

2005; Syed, Hussein, & Mahmud, 2007; Thabet, Stretch, & Vostanis, 2000). The first study conducted in Brazil to investigate the overall prevalence of childhood mental disorders was in the 1980s, where 828 children aged between 5 and 14 years old were assessed, whereas 10% had a psychiatric disorder (Almeida-Filho, 1982). In 2004, a study carried out in Southeast Brazil by Fleitlich-Bilyk and Goodman (2004) assessed 1.251 children aged between 7 and 14 years old using current diagnostic criteria and international measures, in which 13% of the sample presented psychiatric disorders. A year later, in a survey of child mental health problems in Northeast Brazil (Goodman et al., 2005), it was found that 7% of the 100 evaluated children (5 to 14 years old) had problems. Two other Brazilian studies can be mentioned, although the intentions in these were only to screen possible child mental health problems, without claiming to be a prevalence study (Cury & Golfeto, 2003; Ferrioli, Marturano, & Puntel, 2007). Both studies used community samples and assessed children between 6 and 12 years old. In general, Cury and Golfeto (2003) found behavioral problems in 18.7% of the children and Ferrioli et al. (2007) in 19% of them. More recently, two Brazilian cohort studies investigated mental health problems. One of them, conducted by Rodriguez, Silva, Bettiol, Barbieri and Rona (2011), carried out in the Northeast of Brazil, assessed 805 children at 10/11 years old and found an overall prevalence of mental health problems of 47,7%. The other one, conducted in the South of Brazil by Anselmi et al. (2010), evaluated attention and hyperactivity problems in 4.423 children, reporting a prevalence rate of 19,9%.

Two other issues are worth mentioning in relation to the investigation of mental health problems. The first one refers to the differences between behavioral and emotional problems in boys and girls. There is a vast literature that indicates that boys tend to have more externalizing problems and girls more internalizing problems (Cury & Golfeto, 2003; Marturano, Toller, & Elias, 2005; Syed et al., 2007; Zahn-Waxler, Klimes-Dougan, & Slattery, 2000), highlighting the importance of considering the peculiarities of each group in identifying mental health problems. The second one concerns the role of social and environmental factors in behavioral outcomes. Most of the literature suggests that when social circumstances are unfavorable, the impact of biological risk conditions could worsen developmental outcomes, including behavioral performance (A. Goodman, Fleitlich-Bilyk, Patel, & R. Goodman, 2007; Lund et al., 2010; Lund et al., 2011; Masten & Gerwitz, 2006; Sameroff & Fiese, 2005).

Therefore, the investigation of mental health problems, according to gender and considering social factors, may reveal important details for the mental health services and contribute to the prevention and reduction of behavioral problems in adulthood.

The aim of this study is to investigate mental health problems, including behavioral and emotional problems, in a Brazilian cohort of children, at the age of 10 years, according to gender, and to assess the association of family characteristics and behavioral performance for boys and girls.

Method

Study design and data collection:

This study was part of a large prospective and longitudinal cohort study, conducted in the city of Ribeirão Preto, State of São Paulo, a southeast region of Brazil. Its aim was to investigate the association between birth weight and cognitive function, behavioral problems, arterial blood pressure, childhood depression, pulmonary function, bronchial asthma, allergic rhinitis and intestinal inflammatory disease during school

age. The basic study design and details of the study population have been described previously (Cardoso et al., 2007; Silva et al., 2011).

In short, the large study was conducted in two phases. The first phase took place between April 1994 and August 1994, where data regarding a sample of 3.663 live born infants delivered at 10 maternity hospitals in the city of Ribeirão Preto was collected, representing 99% of all live births. The following information was obtained, using a standard questionnaire applied in interviews with the mothers, right after birth and with oral consent: anthropometric data (weight and length), gestational age and data from social factors (marital status, maternal and paternal education and number of household members). The socioeconomic status was collected at school age. Children whose mothers did not live in the studied area (733/ 20%) and twin births (84/ 2.3%) were excluded from the study; the sample size of this cohort was reduced to 2.846 individuals.

A follow-up study, corresponding to the second phase of the large study, was conducted in 2004, when the original children were school aged (10 years). Out of the 2.846 children participating in the first phase, 1.138 (40%) were found. To locate the sample of schoolchildren enrolled in the 125 elementary schools existing in Ribeirão Preto, a data bank, managed by the State Department of Education, was consulted. The full names of the students and of their parents, as well as school and grade were obtained as well. Some of the children who were not identified in school were located by an active search starting from the address recorded on the birth questionnaire. Once an individual belonging to the cohort was identified, the family was contacted by phone. The child's legal guardian was then invited to attend a meeting at school. After the reasons for the evaluation were explained, written informed consent was requested from the legal guardians, including the various stages of the study (clinical and psychological evaluation). Out of the 1.138 children located, psychological data were available from 677 (59.5%) children (345/51% males and 332/49% females) aged 10 years at the time of assessment.

Comparison of the characteristics of the participants at birth and school age is presented elsewhere (Silva et al., 2011). In brief, there was no difference in the participants who were followed up compared to those who were eligible to follow up but did not participate regarding marital status (married x unmarried), maternal and paternal education (≤ 8 years of study x more than 8 years of study) and offspring sex.

Instruments and measures:

Mental health problems were assessed using the Portuguese (Brazilian) version of the Strengths and Difficulties Questionnaire (SDQ), designed to screen behavioral and emotional problems of children and adolescents from 4 to 16 years of age (Fleitlich, Cortázar, & Goodman, 2000; Goodman, 1997; Woerner et al., 2004). It contains four scales that assess psychiatric symptoms (emotional problems, conduct problems, hyperactivity/inattention and peer problems) and a scale that reflects prosocial behavior. Scores are assigned to each of these scales (0, 1 or 2 as false, true or somewhat true) and scores for the 4-symptom scales are summed up to provide a "total difficulties score" ranging from 0 to 40, with higher scores indicating poorer mental health. The cut-off point for the Brazilian population (total score ≥ 16) refers to clinical range and scores below this value were classified as normal range. Parents, teachers or the youths themselves could answer the questionnaire. In the present study, a parent report version was used.

Assessment of child and family characteristics: data on birth weight (grams), gestational age (weeks), condition at birth (preterm < 37 weeks and at term \geq 37 weeks) and gender, as well as data on maternal and paternal education (low: \leq 8 and high: > 8 years of study), marital status (married or unmarried) and number of household members (\leq 4 and > 4 members) were collected at the birth of the child and were obtained from an interview with the mother. The assessment of the socioeconomic status was collected upon reaching school age, also through an interview with the mother. For this purpose, we used a Brazilian Questionnaire that evaluates the purchasing power of consumer groups, proposed by the Associação Brasileira de Empresas de Pesquisa (2008), where two levels are considered: levels A1, A2, B1, B2 corresponding to the most favored economic classes and levels C, D and E corresponding to the disadvantaged economic classes.

Statistical analysis:

Descriptive statistics were computed for the socioeconomic characteristics of children and families. We compared child's birth weight, gestational age, condition at birth and social characteristics (marital status, maternal and paternal education, socioeconomic status and number of household members) among boys and girls using the Chi-square test. To compare the prevalence rates of behavioral problems on SDQ scales (clinical range) for boys and girls we used logistic regression, expressed as crude odds ratio (OR), with a 95% confidence interval. For this analysis, the scores on SDQ scales were dichotomized (i.e., clinical *versus* normal range). Simple and multiple linear regression analyses were used to estimate the associations between family characteristics and behavioral performance for boys and girls separately, with a 95% confidence interval. In a first step, crude odds ratio was calculated and afterward, to control for possible confounders, we calculated adjusted odds ratio (AOR). In the multiple regression analysis, adjustment was performed for all the independent variables (marital status, maternal and paternal education, socioeconomic status and number of household members) and all of them were treated as categorical (binary variables). In the regression analyses, the reference (or comparison) group was chosen (when appropriate) as the hypothesized lowest risk group.

All analyses were considered to be statistically significant when the p-value was \leq 0.05. Statistical analyses were carried out using SPSS for Windows (version 17.0).

This study was approved by the Research Ethics Committee of the University of São Paulo and no incentives were provided to the schools or to the student participants. Parents or legal guardians gave written consent to participate.

Results

Results for child and family characteristics are presented on Table 1.

Table 1: Child and family characteristics according to gender

	Boys n = 345	Girls n = 332	p value [†]
Child characteristics			
Birthweight (g)*	3079,94 (712,63)	2954,37 (644,27)	0,016
Gestational Age (weeks)*	37,81 (2,64)	37,93 (2,40)	0,560
Condition**			
Preterm (< 37 weeks)	81 (23,5)	73 (22,0)	0,644
At term (≥ 37 weeks)	264 (76,4)	259 (78,0)	
Family characteristics***			
Marital Status			
Married	273 (85,0)	276 (85,4)	0,886
Unmarried	48 (15,0)	47 (14,6)	
Maternal education			
Low (≤ 8years of study)	187 (60,3)	199 (64,0)	0,346
High (> 8 years of study)	123 (39,7)	112 (36,0)	
Paternal education			
Low (≤ 8years of study)	178 (63,6)	159 (56,8)	0,101
High (> 8 years of study)	102 (36,4)	121 (43,2)	
Socioeconomic status			
Most favored economic classes	123 (35,8)	138 (42,3)	0,081
Disadvantaged economic classes	221 (64,2)	188 (57,7)	
Number of household members			
≤ 4 members	217 (66,8)	214 (66,9)	0,977
> 4 members	108 (33,2)	106 (33,1)	

*Values are mean (SD)

**Values are number (%)

***The number of children on whom data were available, varied by background characteristic

†p value was calculated using Chi-Square test

According to Table 1, the only significant difference found between boys and girls was birth weight, where boys had a higher birth weight than girls. There was no difference between the others child characteristics (gestational age and condition at birth) and family characteristics (marital status, maternal and paternal education, socioeconomic status and number of household members, $p \leq 0.05$).

The mental health problems (clinical range) on the Strengths and Difficulties Questionnaire scales, for boys, girls and total sample are showed on Table 2.

Table 2: Mental health problems (clinical range) on the Strengths and Difficulties Questionnaire scales, for boys, girls and total sample

SDQ scales	Total n = 673	Boys* n = 343	Girls** n = 330	OR (95% CI)***	p Value
Total difficulties score	257 (38,2)	143 (41,7)	114 (34,5)	1,35 (0,99 to 1,85)	0,057
Emotional symptoms	363 (53,9)	173 (50,4)	190 (57,6)	0,75 (0,55 to 1,02)	0,064
Hyperactivity	169 (25,1)	107 (31,2)	62 (18,8)	1,96 (1,37 to 2,80)	0,000
Conduct problems	224 (33,3)	133 (38,8)	91 (27,6)	1,66 (1,20 to 2,30)	0,002
Peer problems	181 (26,9)	93 (27,1)	88 (26,7)	1,02 (0,73 to 1,44)	0,896
Prosocial behaviour	25 (3,7)	16 (4,7)	9 (2,7)	1,74 (0,76 to 4,01)	0,189

Values are number (%)

*Data on SDQ were missing for two boys

**Data on SDQ were missing for two girls

***Reference group: girls

Table 2 shows that the proportion of boys scoring in the clinical range of the SDQ was significantly higher than girls for the hyperactivity scale (31.2% versus 18.8%, OR 1.96, 95% CI, 1.37-2.80, respectively) and conduct problems (38.8% versus

27.6%, OR 1.66, 95% CI, 1.20-2.30, respectively). There was a tendency to have a significant difference for total difficulties score, where boys scored higher than girls (41.7% versus 34.5%, OR 1.35, 95% CI, 0.99-1.85, respectively) and for emotional symptoms, where girls scored higher than boys (57.6% versus 50.4%, OR 0.75, 95% CI, 0.55-1.02, respectively). No difference was found in peer problems and prosocial behavior scales among boys and girls.

Tables 3 and 4 show the results of the simple (crude odds ratio) and multiple (adjusted odds ratio) linear regression analyses, used to estimate the associations between family characteristics and behavioral performance for boys and girls, respectively.

Table 3: Associations between family characteristics and behavioral problems for boys (n = 343)

Family characteristics	OR (crude) (95% CI)	OR (adjusted)* (95% CI)
Marital Status (n = 644)		
Married	Reference	Reference
Unmarried	0,99 (0,53 to 1,86)	1,02 (0,46 to 2,24)
Maternal Education (n = 621)		
Low (\leq 8 years of study)	2,44 (1,51 to 3,96)	1,26 (0,65 to 2,45)
High ($>$ 8 years of study)	Reference	Reference
Paternal education (n = 560)		
Low (\leq 8 years of study)	3,08 (1,79 to 5,28)	1,65 (0,82 to 3,29)
High ($>$ 8 years of study)	Reference	Reference
Socioeconomic status (n = 670)		
Disadvantaged economic classes	3,11 (1,91 to 5,05)	2,70 (1,38 to 5,28)
Most favored economic classes	Reference	Reference
Number of household members (n = 645)		
\leq 4 members	Reference	Reference
$>$ 4 members	1,38 (0,86 to 2,20)	1,03 (0,58 to 1,83)

*Adjustments made for all factors in the table

Table 3 shows that in a non-adjusted model (crude odds ratio), low maternal education (OR 2.44, 95% CI, 1.51–3.96), low paternal education (OR 3.08, 95% CI, 1.79–5.28) and disadvantaged socioeconomic classes (OR 3.11, 95% CI, 1.91–5.05) were considered risk factors for behavioral problems for school aged boys (10 years). After adjustment, the only variable that remained associated with behavioral problems for boys was lower socioeconomic status, specifically disadvantaged economic classes (AOR 2.70, 95% CI, 1.38–5.28).

Table 4: Associations between family characteristics and behavioral problems for girls (n = 330)

Family characteristics	OR (crude) (95% CI)	OR (adjusted)* (95% CI)
Marital Status (n = 644)		
Married	Reference	Reference
Unmarried	1,65 (0,88 to 3,09)	1,00 (0,40 to 2,49)
Maternal Education (n = 621)		
Low (\leq 8 years of study)	3,16 (1,82 to 5,49)	2,23 (1,10 to 4,52)
High ($>$ 8 years of study)	Reference	Reference
Paternal education (n = 560)		
Low (\leq 8 years of study)	2,40 (1,40 to 4,08)	1,54 (0,74 to 3,18)
High ($>$ 8 years of study)	Reference	Reference
Socioeconomic status (n = 670)		
Disadvantaged economic classes	2,05 (1,26 to 3,31)	0,98 (0,50 to 1,95)
Most favored economic classes	Reference	Reference
Number of household members (n = 645)		
\leq 4 members	Reference	Reference
$>$ 4 members	2,75 (1,69 to 4,49)	2,54 (1,40 to 4,61)

*Adjustments made for all factors in the table

Table 4 shows that the variables associated with behavioral problems for girls, in a non-adjusted model, were low maternal education (OR 3.16, 95% CI, 1.82-5.49), low paternal education (OR 2.40, 95% CI, 1.40-4.08), disadvantaged socioeconomic classes (OR 2.05, 95% CI, 1.26-3.31) and number of household members (OR 2.75, 95% CI, 1.69-4.49). After adjustment, only low maternal education (AOR 2.23, 95% CI, 1.10-4.52) and more than four members in the house (AOR 2.54, 95% CI, 1.40-4.61) showed association with behavioral problems for girls at 10 years of age.

Discussion

Behavioral assessment conducted by SDQ showed that boys have more hyperactivity and conduct problems than girls at 10 years of age. No difference was found for peer problems and prosocial behavior. In the total difficulties score, there was a significant tendency for difference ($p=0.057$) between boys and girls, where boys presented more behavioral problems than girls. In the emotional symptoms scale, although girls presented more emotional symptoms than boys, the comparisons just failed to reach significance. These results are consistent with many studies that found that boys have more externalizing and attention problems than girls, in addition to more problems in the total difficulties score. In a Brazilian study conducted by Anselmi et al. (2010), 4.423 mothers or guardians completed the SDQ and the results also indicated that boys showed more attention and hyperactivity problems than girls (24% versus 16%, $p < 0,001$). In another Brazilian cohort study, Rodriguez et al. (2011) found that male gender was significantly associated with conduct problems and attention deficit/hyperactivity disorder. Cury and Golfeto (2003) also found that boys had higher frequencies of conduct and hyperactivity problems compared to girls and male sex was also associated with psychiatric disorder in children in Karachi (Pakistan) and in Kerala (South India), according to Syed et al. (2007) and R. Hackett et al. (1999), respectively.

On the other hand, girls are reported to have more internalizing problems, such as emotional symptoms, when compared to boys, as shown by studies of Cury and Golfeto (2003), Marturano et al. (2005) and Zahn-Waxler et al. (2000). Indeed, in this study a higher proportion of girls have showed more emotional symptoms than the boys, but since this difference was only marginally significant ($p = 0.064$), the results can be viewed as questionable.

Although our results are consistent with the literature regarding the type of disorder for boys and girls, the high proportion of behavioral problems found in both groups at all SDQ scales draws attention, since significant differences were found only in hyperactivity and conduct problems and also a tendency to significant difference for the total difficulties score. Overall, the total prevalence rates found here are remarkably higher than the rates described in the literature, both in Brazil and worldwide. A first point to be discussed is related to cultural issues. We have to remind that this study was conducted in a developing country, which could make a difference concerning prevalence rates. Many authors, such as Canino and Alegría (2008) and R. Hackett and L. Hackett (1999) agree that the prevalence of some of the most common specific disorders and syndromes, as well as risks and protective factors, vary across cultures. In a study of literature review on the possible association of poverty with common mental disorders in low and middle income countries, Lund et al. (2010) and Lund et al. (2011) noted that 79% of the analyzed studies reported a positive association, pointing out that in fact the social and economic conditions are associated with increased mental disorders in these countries. A review of 52 studies addressing the prevalence of psychopathology among children and adolescents conducted by Roberts et al. (1998) found that prevalence estimates ranged from approximately 1% (studies conducted in London and Hong Kong) to 51% (studies

conducted in Puerto Rico and USA), with a global mean of 15.8%. In Brazil, seven studies investigated possible prevalence of child and adolescent disorders, conducted by Almeida-Filho (1982), Anselmi et al. (2010), Cury and Golfeto (2003), Ferrioli et al. (2007), Fleitlich-Bilyk and Goodman (2004), Goodman et al. (2005) and Rodriguez et al. (2011). In particular, Cury and Golfeto (2003) and Ferrioli et al. (2007) conducted their studies in the same city as our, using also the SDQ (parent version) as a screener for child mental health problems. They found, respectively, that 19% and 18,7% of the evaluated children were on the clinical range of the total difficulties score, which still represents a much lower rate than those found in our study (38.2% for total sample). In fact, for all the SDQ scales, the rates found in the present study were higher than those described in the mentioned studies. Cury and Golfeto (2003) also presented their results according to gender and obtained lower prevalence rates on all SDQ scales for both boys and girls compared with our study.

Furthermore, three other studies conducted in Brazil also obtained lower prevalence rates of behavioral problems. Goodman et al. (2005) and Fleitlich-Bilyk and Goodman (2004) found psychiatric disorders in 5,3% and 12,7% of the children, respectively, both using SDQ as a mental health assessment, while Almeida-Filho (1982) found a prevalence rate of 13%. In a Brazilian cohort study conducted by Anselmi et al. (2010), the only SDQ scale assessed was attention deficit/hyperactivity disorder, with frequencies of 16% for girls and 24% for boys, still lower than those of our study, especially for boys.

However, in another Brazilian cohort study, conducted in Northeast of Brazil, also using the SDQ (parent version), prevalence rates were a little higher than those of our study (Rodriguez et al., 2011). They found frequencies of 47,7% for mental health problems, 58,2% for emotional symptoms, 27,2% for peer problems, 48,8% for conduct problems and 32,2% for hyperactivity disorders. The authors argued that is possible that the instrument is more difficult to administer in people with a higher level of poverty and lower educational level, since their study was conducted in a poor Brazilian city located in one of the most disadvantaged regions of Brazil. On the other hand, they also argued that they do not believe that the administration of the test could explain the high prevalence of psychological problems, since the psychologists in their study were well trained.

They conclude that socioeconomic and demographic conditions could be a clue to the understanding of the high rates of mental health problems reported in their study.

Four other studies carried out in developing countries (Bangladesh, Sri Lanka, Pakistan and the Gaza strip area) also provided information on mental health problems using the SDQ. Both studies found prevalence rates of behavioral problems lower than ours in SDQ total difficulties score: 13% (Mullick & Goodman, 2001), 16,3% for the age of 11 years (Thabet et al., 2000), 11,7% (Prior et al. 2005) and 34% (Syed et al., 2007), also according to the parents reports. In a study about child and adolescent psychiatric problems in India, Bhola and Kapur (2003) reviewed 55 epidemiological studies conducted from 1964 to 2002 in the community and school settings. The prevalence rates in community based studies ranged from 0,48% to 29,40% and for school based studies they ranged from 3,23% to 36,50%. In another study carried out in Kerala (South India), Hackett et al. (1999) found that 9,4% of the children aged from 8 to 12 years of age presented psychiatric disorder. In a multicenter study of childhood mental disorders in four developing countries (Sudam, Philippines, India and Colombia), Giel et al. (1981) found rates between 12% and 29% in the four study areas, using screening questionnaires completed usually by the mother.

The higher proportion of behavioral and emotional problems among the children in our cohort, when compared to both national and international studies, demands an explanation. What could explain the high proportions found in the clinical range on

all SDQ scales? One possible reason lies in the role of the developmental factors, namely the extent to which cultural background and context affect the manifestation of symptoms and syndromes. An interesting issue is discussed by Kieling et al. (2011) when commenting the possible sources of discrepancy between results all over the world. They argued that different exposures to risk factors and protective factors, and the cultural context in which the mental health problems occur can determine their magnitude and extension. As the authors said, culture defines and creates specific sources of distress and impairment and affects how symptoms are interpreted. Considering that in this study maternal education was associated with behavioral outcomes for girls, and considering that a good proportion of mothers (64%) presented low education level (< 8 years of study), this condition could act as a risk factor for some of these girls. The same argument may apply to the boys, concerning the socioeconomic status, which was the only associated variable with behavioral problems. Data show that 64% of their families were at disadvantaged economic classes, which may reflect a developmental risk condition for the boys. Two Brazilian studies addressing the social factors associated with child mental health problems, using the SDQ, showed that socioeconomic status, the area of residence (shanty town, urban or rural area), maternal psychiatric illness, family violence, non-traditional family, poor general health, low IQ, repeating a year at school and male gender were all strongly associated with higher rates of probable psychiatric disorders among Brazilian 7-14 year olds (Fleitlich & Goodman, 2001; Goodman et al., 2007). These results are in concordance with the results found here, where association between social factors and behavioral problems were found for boys and girls. In a review work about child and adolescent mental health problems, the authors reported that one of the life-long risk factors for mental disorders is deficiencies in psychosocial and educational environment, in agreement with the results reported here (Kieling et al., 2011). Taking into account only socio-demographic variables, there is also evidence for association between paternal age and mental health problems (Rodriguez et al., 2011), family income and hyperactivity problems (Anselmi et al., 2010), low socioeconomic status and behavioral problems (Prior et al., 2005) and school type (community schools) regarding behavioral problems (Syed et al., 2007). All these results highlight the importance of considering the impact of these social risk conditions for a better understanding of behavioral outcomes.

Another aspect possibly accounting for the higher proportion of behavioral problems concerns the type of instrument used. Although SDQ is a standardized measure for the Brazilian population, it is only a screening questionnaire which is not intended to be a standardized assessment measure suitable for generating exact diagnoses. It is important to keep in mind that SDQ is only capable of screening behavioral and emotional problems while the diagnosis of psychiatric problems and behavioral disorders must necessarily be done using other appropriate measures. As pointed out by Fleitlich-Bilyk and Goodman (2004), to generate reliable prevalence estimates, a study needs to have a proper sample size, a representative sampling frame, standardized assessment measures, explicit and internationally accepted diagnostic criteria and assessment not only for symptoms but also for resultant distress and social impairment. In addition, we used here only the version of the SDQ completed by parents, which leaves a gap in the study since versions with multiple informants could provide more accurate results.

A third question refers to study design: most of the studies cited here used community samples and case-control studies. In these specific studies, the prevalence rates of mental problems were lower, while in the Brazilian cohort studies mentioned, including this one, the prevalence rates were higher. In cohort studies a group of individuals who shares the same cultural and historical experiences is assessed within a narrow range of time. This may reflect a more constant influence of socio-cultural characteristics of the participants and their families and can help to further understanding the developmental trajectories of child and adolescent mental health prob-

lems, which may have influenced the high prevalence rates reported here, compared with studies of different designs.

Another aspect to remind is that the high prevalence found in our study may be transient behavioral problems and future prospective studies should be conducted to verify the persistence of symptoms as well as the conditions attached to their increase or decrease over time. It is worth remembering that not every behavioral problem will necessarily become a psychiatric disorder.

Other issue to consider was emphasized by Fleitlich and Goodman (2000), as for the wide variation in prevalence rates of psychiatric disorders observed in childhood and adolescence. The authors argued that to understand this great variation, some factors must be considered, for example, understanding the questions of the questionnaires by respondents, whether or not included measures of the impact of symptoms on the lives of children and adolescents and the need for multiple informants. In the present study, it was not possible to include measures of the impact of symptoms and was used only one version of the SDQ (parent report), which may have contributed to the high prevalence of mental health problems. However, we believed that there was no adverse effect on the understanding of the SDQ questions by respondents since in our study we used a previous validated version for the Brazilian population and a well trained team of professionals in the appropriate use of the instrument.

Also regarding possible factors accounting for the high rates of mental health problems, it is possible that the parents who agreed to participate in the study could be those who had a child with psychological problems, making them more motivated to participate.

Last, it is worth remembering the comments of R. Hackett and L. Hackett (1999): dimensions of disorder vary across countries, cultures and social/demographic conditions. Because of that, it is important to establish specific prevalence rates studies encompassing such peculiarities in order to prevent methodological problems, which appears to be a major concern about epidemiological studies.

We have identified three limitations in our study: 1) We did not have information about those who participated and those lost to follow up regarding all variables used in this study; 2) Reports on the mental health assessment (SDQ) were completed only by the parents. The literature indicates that prediction of diagnostic status is optimal when parent, teacher and self-reports are available, which was not possible in this study; and 3) The absence of a clinical diagnosis or other instrument (golden standard) to measure signs and symptoms. However, it is clear for us, that our intention was not to establish prevalence rates of behavior disorders, but to provide an initial investigation of child mental health problems among Brazilian school-aged boys and girls. We know that special care must be taken into account when comparing our results with those obtained by others who established prevalence rates of psychiatric disorders, since methodological differences are evident.

The strengths of this study are, first, providing initial information about behavioral problems among Brazilian children at 10/11 years old, both boys and girls. Since, in Brazil, there are few studies investigating prevalence rates specifically for cohort children, we believe this is a necessary starting point. As mentioned by Kieling et al. (2011), the knowledge of the prevalence of mental health problems is often a first step to determine the magnitude of the problem. This could help to provide relevant information for development of services for mental health problems among children. The second contribution is the identification of social factors associated with risk conditions for behavioral problems among boys and girls. We believe that early identification of child problems in behavioral outcomes may support intervention strategies which aims at minimizing the impact of certain risk factors throughout their development.

References

- Almeida-Filho, N. (1982). Estudo de prevalência de desordens mentais na infância em zona urbana de Salvador, Bahia. *Jornal Brasileiro de Psiquiatria*, 31(4), 225-236.
- Anselmi, L., Meneses, A. M. B., Barros, F. C., Hallal, P. C., Araújo, C. L., Dominguez, M. R., & Rohde, L. A. (2010). Early determinants of attention and hyperactivity problems in adolescents: The 11-year follow-up of the 1993 Pelotas (Brazil) birth cohort study. *Cadernos de Saúde Pública*, 26(10), 1954-1962.
- Associação Brasileira de Empresas de Pesquisa. (2008). Questionário de Classificação Sócio-Econômico. Disponível em <http://www.abep.org/novo/CMS/Utils/FileGenerate.ashx?id=22>. Acesso em 20 de outubro de 2011.
- Bhola, P., & Kapur, M. (2003). Child and adolescent psychiatric epidemiology in India. *Indian Journal of Psychiatry*, 45(4), 208-217.
- Canino, G., & Alegria, M. (2008). Psychiatric diagnosis – is it universal or relative to culture? *Journal of Child Psychology and Psychiatry*, 49(3), 237-250.
- Cardoso, V. C., Simões, V. M. F., Barbieri, M. A., Silva, A. A. M., Bettiol, H., Alves, M. T. S. S. B., & Goldani, M. Z. (2007). Profile of three Brazilian birth cohort studies in Ribeirão Preto, SP and São Luís, MA. *Brazilian Journal of Medical and Biological Research*, 40(9), 1165-1176.
- Cury, C. R., & Golfeto, J. H. (2003). Questionário de capacidades e dificuldades (SDQ): Um estudo em escolares de Ribeirão Preto. *Revista Brasileira de Psiquiatria*, 25(3), 139-145.
- Ferrioli, S. H. T., Marturano, E. M., & Puntel, L. P. (2007). Contexto familiar e problemas de saúde mental infantil no Programa de Saúde da Família. *Revista de Saúde Pública*, 41(2), 251-259.
- Fleitlich, B., Cortázar, P. G., & Goodman, R. (2000). Questionário de capacidades e dificuldades (SDQ). *Infanto – Revista de Neuropsiquiatria da Infância e Adolescência*, 8(1), 44-50.
- Fleitlich, B., & Goodman, R. (2000). Epidemiologia. *Revista Brasileira de Psiquiatria*, 22(Supl.2), 2-6.
- Fleitlich, B., & Goodman, R. (2001). Social factors associated with child mental health problems in Brazil: Cross sectional survey. *British Medical Journal*, 15, 599-600.
- Fleitlich-Bilyk, B., & Goodman, R. (2004). Prevalence of child and adolescent psychiatric disorders in southeast Brazil. *Journal of the American Academy of Child & Adolescent Psychiatry*, 43(6), 727-734.
- Giel, R., Arango, M. V., Climent, C. E., Harding, T. W., Ibrahim, H. H. A., Ladrigo-Ignacio, L., Srinivasa Murthy, R., Salazar, M. C., Wig, N. N., & Younis, Y. O. A. (1981). Childhood mental disorders in primary health care: Results of observations in four developing countries. *Pediatrics*, 68(5), 677-683.
- Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, 38(5), 581-586.

Goodman, A., Fleitlich-Bilyk, B., Patel, V., & Goodman, R. (2007). Child, family, school and community risk factors for poor mental health in Brazilian schoolchildren. *Journal of the American Academy of Child & Adolescent Psychiatry*, 46(4), 448-56.

Goodman, R., Neves dos Santos, D., Robatto Nunes, A. P., Pereira de Miranda, D., Fleitlich-Bilyk, B., & Almeida-Filho, N. (2005). The Ilha de Maré study: A survey of child mental health problems in a predominantly African-Brazilian rural community. *Social Psychiatry and Psychiatric Epidemiology*, 40(1), 11-17.

Hackett, R., & Hackett, L. (1999). Child psychiatry across cultures. *International Review of Psychiatry*, 11, 225-235.

Hackett, R., Hackett, L., Bhakta, P., & Gowers, S. (1999). The prevalence and associations of psychiatric disorder in children in Kerala, South India. *Journal of Child Psychology and Psychiatry*, 40(5), 801-807.

Kieling, C., Baker-Henningham, H., Belfer, M., Conti, G., Ertem, I., Omigbodun, O., Rohde, L. A., Srinath, S., Ulker, N., & Rahman, A. (2011). Child and adolescent mental health worldwide: Evidence for action. *The Lancet*, 378(9801), 1515-1525.

Lund, C., Breen, A., Flisher, A. J., Kakuma, R., Corrigall, J., Joska, J. A., Swartz, L., & Patel, V. (2010). Poverty and common mental disorders in low and middle income countries: A systematic review. *Social Science & Medicine*, 71(3), 517-528.

Lund, C., De Silva, M., Plagerson, S., Cooper, S., Chisholm, D., Das, J., Knapp, M., & Patel, V. (2011). Poverty and mental disorders: Breaking the cycle in low-income and middle-income countries. *The Lancet*, 378(9801), 1502-1514.

Maturano, E. M., Toller, G. P., & Elias, L. C. S. (2005). Gênero, adversidade e problemas socioemocionais associados à queixa escolar. *Estudos de Psicologia (Campinas)*, 22(4), 371-380.

Masten, A. S., & Gerwitz, A. H. (2006). Vulnerability and resilience in early child development. In K. McCartney & D. Phillips (Eds.), *Blackwell handbook of early childhood development* (pp. 22-43). Chichester: Blackwell.

Mullick, M. S. I., & Goodman, R. (2001). Questionnaire screening for mental health problems in Bangladeshi children: A preliminary study. *Social Psychiatry and Psychiatric Epidemiology*, 36(2), 94-99.

Prior, M., Virasinghe, S., & Smart, D. (2005). Behavioral problems in Sri Lankan schoolchildren: Associations with socio-economic status, age, gender, academic progress, ethnicity and religion. *Social Psychiatry and Psychiatric Epidemiology*, 40(8), 654-662.

Ravens-Sieberer, U., Wille, N., Erhart, M., Bettge, S., Wittchen, H. U., Rothenberger, A., Herpertz-Dahlmann, B., Resch, F., Holling, H., Bullinger, M., Barkmann, C., Schulte-Markwort, M., Dopfner, M., & BELLA study group. (2008). Prevalence of mental health problems among children and adolescents in Germany: Results of the BELLA study within the National Health Interview and Examination Survey. *European Child and Adolescent Psychiatry*, 17(Suppl. 1), 22-33.

Roberts, R. E., Attkisson, C. C., & Rosenblatt, A. (1998). Prevalence of psychopathology among children and adolescents. *American Journal of Psychiatry*, 155(6), 715-725.

Rodriguez, J. D. M., Silva, A. A. M., Bettiol, H., Barbieri, M. A., & Rona, R. J. (2011). The impact of perinatal and socioeconomic factors on mental health problems of children from a poor Brazilian city: A longitudinal study. *Social Psychiatry and Psychiatric Epidemiology*, 46(5), 381-391.

Rohde, L. A. (2011). The need of epidemiological data on child mental disorders from low-middle income countries. *European Child and Adolescent Psychiatry*, 20(10), 497-498.

Rutter, M. (1996). Connections between child and adult psychopathology. *European Child and Adolescent Psychiatry*, 5(Suppl. 1), 4-7.

Sameroff, A. J., & Fiese, B. H. (2005). Models of development and developmental risk. In C. H. Zeanah Jr. (Org.), *Handbook of infant mental health* (pp. 3-19). New York: The Guilford Press.

Silva, A. A., Barbieri, M. A., Cardoso, V. C., Batista, R. F., Simões, V. M., Vianna, E. O., Gutierrez, M. R., Figueiredo, M. L., Cardoso, N. A., Pereira, T., Rodriguez, J. D., Loureiro, S. R., Ribeiro, V. S., & Bettiol, H. (2011). Prevalence of non-communicable diseases in Brazilian children: Follow-up at school age of two Brazilian birth cohorts of the 1990's. *BMC Public Health*, 11, 486-518.

Skovgaard, A. M., Olsen, E. M., Christiansen, E., Houmann, T., Landorph, S. L., & Jorgensen, T. (2008). Predictors (0-10 months) of psychopathology at age 11/2 years – a general population study in the Copenhagen Child Cohort CCC 2000. *Journal of Child Psychology and Psychiatry*, 49(2), 553-562.

Syed, E. U., Hussein, S. A., & Mahmud, S. (2007). Screening for emotional and behavioural problems amongst 5–11-year-old school children in Karachi, Pakistan. *Social Psychiatry and Psychiatric Epidemiology*, 42(5), 421-427.

Thabet, A. A., Stretch, D., & Vostanis, P. (2000). Child mental health problems in Arab children: Application of the strengths and difficulties questionnaire. *International Journal of Social Psychiatry*, 46(4), 266-280.

Woerner, W., Fleitlich-Bilyk, B., Martinussen, R., Fletcher, J., Cucchiaro, G., Dalgalarondo, P., Lui, M., & Tannock, R. (2004). The strengths and difficulties questionnaire overseas: Evaluations and applications of the SDQ beyond Europe. *European Child & Adolescent Psychiatry*, 13(Suppl. 2), 47-54.

Zahn-Waxler, C., Klimes-Dougan, B., & Slattery, M. J. (2000). Internalizing problems of childhood and adolescence: Prospects, pitfalls, and progress in understanding the development of anxiety and depression. *Development and Psychopathology*, 12(3), 443-466.

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Endereços para correspondência

Adriana Martins Saur
adrianasaur@yahoo.com.br

Behavioral and emotional problems of schoolchildren according to gender

Sonia Regina Loureiro
srlourei@fmrp.usp.br

I. Docente. Centro Universitário Barão de Mauá (CBM). Ribeirão Preto. Estado de São Paulo. Brasil.

II. Docente. Faculdade de Medicina de Ribeirão Preto. Universidade de São Paulo (FMRP-USP). Ribeirão Preto. Estado de São Paulo. Brasil.

i Apoio FAPESP e CNPq.