ORIGINAL ARTICLE

Mental health and quality of life in pre- and early adolescents: a school-based study in two contrasting urban areas

Saúde mental e qualidade de vida em adolescentes: um estudo entre escolares em duas áreas urbanas contrastantes

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Abstract

Objective: To estimate the prevalence of mental health problems and to assess the quality of life in pre- and early adolescents living in two contrasting urban areas in Brazil, as well as to identify the impact of demographic factors on mental health, quality of life and school performance. Method: Using school samples, the Strength and Difficulties Questionnaire and the Quality of Life Inventory were administered to 424 (52%) boys and 387 (48%) girls (mean age 12.6 ± 1.3 years) in better-off central and poorer outer-city areas. Results: In the total sample, the prevalence of probable psychiatric cases was 10.1% (n = 77). There were no significant differences in the overall prevalence of behavior problems or global quality of life between central and outer-city areas. However, boys from the outer-city had a higher prevalence of conduct problems (12% vs. 6.2%, p = 0.04), although girls did not differ significantly on any measure. In general, factors associated with poorer mental health were: having no religion, divorced parents, and being male. Conclusion: Living in the poorer outer-city was not associated with worse mental health or quality of life in this sample. This is in contrast with the findings of some other studies, and possible protective factors such as female gender and religion are discussed.

Descriptors: Adolescent health; Mental disorders; Poverty; Gender identity; Religion

Resumo

Objetivo: estimar a prevalência de problemas de saúde mental e estudar a qualidade de vida em adolescentes de duas áreas urbanas contrastantes no Brasil. Além disso, identificar o impacto de fatores demográficos sobre a saúde mental, qualidade de vida e rendimento escolar. Método: Numa amostra de estudantes foram aplicados o Strength and Difficulties Questionnaire *e o Inventário de Qualidade de Vida em 424 (52%) garotos e 387 (48%) garotas (idade média 12,6 ± 1,3 anos) de regiões centrais e da periferia da cidade. Resultados: Na amostra total, a prevalência de algum provável problema mental foi de 10,1% (n = 77). Comparando centro e periferia, não foram encontradas diferenças significativas na prevalência de algum problema mental e qualidade de vida global. Entretanto, os meninos da periferia apresentaram significativamente mais problemas de conduta (12% vs. 6.2%, p = 0.04), enquanto as meninas das duas regiões não diferiram quanto à saúde mental e rendimento escolar. Os fatores associados a uma pior saúde mental foram: não ter religião, ter os pais divorciados e ser do gênero masculino. Conclusão: Viver na periferia não foi associado a uma pior saúde mental e qualidade de vida nesta amostra. Isso contrasta com os achados de outros estudos e fatores de proteção, como gênero feminino e religião, são discutidos.*

Descritores: Saúde do adolescente; Transtornos mentais; Pobreza; Identidade gênero; Religião

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Financing: This research was supported by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP).
Conflict of interests: None
Submitted: April 12, 2006
Accepted: March 7, 2007

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Introduction

Studies on the prevalence of mental disorders and quality of life (QOL) of pre- and early adolescents in Brazil are relatively scarce. After a pioneering epidemiological study done in the 1980s, using a screening instrument, which found the prevalence of 23.4% of behavior problems in 829 children aged 5 to 14 in the city of Salvador,[1] more recently, in the last five years, a series of new epidemiological studies using standardized psychiatric interviews have been published bringing up-to-date information to this field.

Thus, Fleitlich-Bilyk & Goodman, in a cross sectional survey using the Strength and Difficulties Questionnaire (SDQ), investigated 898 children aged 7-14 years old from three different neighborhood areas (rural, poor urban, and stable urban) of the southeastern city of Campos de Jordão-SP.[2] They found a higher rate of probable mental health problems in the poor urban area (22%) than in the rural (12%) and stable urban areas (12%). Another study with the SDQ in the southeastern Brazilian city of Ribeirão Preto-SP, found a rate of 12.5% of probable mental health problems in a small sample of 112 children aged 6-11 years.[3] Fleitlich-Bilyk & Goodman conducted another important epidemiological study in a population-based sample of 1,412 children aged from 7 to 14 years old in the southeastern city of Taubaté-SP, using the Development and Well-Being Assessment-DAWBA interview.[4] The authors found an overall prevalence of psychiatric disorder of 12.7%. Another cross-sectional study with SDQ investigated a randomly chosen sample (n = 327) of sixth graders, between 11 and 15 years old, of all schools of Barretos, another southeastern Brazilian city, finding a similar rate of 12.6% of prevalence of mental health problems.[5] Benvegnu et al. investigated 3,139 children and adolescents from 10 to 17 years old in the southern city of Pelotas-RS.[6] They used the screening instrument Child Behavior Checklist (CBCL) and identified 13.5% of the sample as probable clinical cases (using the total problems scale). Additionally, Goodman et al. investigated the mental health of children and adolescents of a small island in the Northeast of Brazil, Ilha de Maré, in a predominantly African-Brazilian rural community of approximately 4,000 inhabitants.[7] The study used the SDQ and the DAWBA in a representative sample of 430 children and adolescents from 7 to 14 years old. Contrasting with data from the South and Southeast regions of Brazil, the prevalence rate of any mental disorder was 7%.

Although the main epidemiological Brazilian study[4] found a prevalence rate of mental disorders of 12.7%, which does not differ from the rates found in developed countries (like 10% in England[8]), there is little information about the factors associated with the prevalence of mental disorders, especially in the Brazilian socio-cultural context. Among the few studies that addressed such associations, the previously mentioned study done in Salvador[9] investigated the correlation between parent's mental status and children's mental health. It found that mother's mental health problems, family size and child's age were the only significant variables in a regression model. Fleitlich-Bilyk & Goodman, in the Campos de Jordão study, found that poverty, maternal psychiatric illness and family violence were strongly associated with higher rates of probable psychiatric disorders.[2] Similar results were also found by Vitolo et al.[10] who, in a subsample (n = 454) of the Taubaté study,[4] examined the risk factors related to mental health problems in school children and its association with parental beliefs and educational attitudes. They found that physical punishment, specifically spanking the child with a belt, was associated with conduct problems and overall mental health problems in the presence of other risk factors: male gender, parents/caretakers with mental health problems, and adverse socioeconomic conditions.

While these recent studies on rates of mental disorders and associated determinants are gradually clarifying the epidemiology of mental health in different subpopulations in Brazil, little is known about the QOL of Brazilian children and adolescents. The concept of QOL has started to gain a lot of interest in many medical fields, since traditional measures of diseases and their treatments, such as symptoms and mortality rates, are rather limited and fail to give a wider view of general mental health and wellbeing.[11] Research on QOL in child and adolescent psychiatry has only started recently, in the late 1990s. Interesting studies have included comparisons between the burden of chronic physical and psychiatric diseases,[12] the impact of gender and age on QOL (QOL decreases with age and is better among boys),[13,14] and the complex relationship between QOL and different psychiatric disorders (for instance, despite of being severely affected by externalizing problems, children report good QOL).[15,16] The few QOL studies carried out in Brazil with children and adolescents have investigated patients with physical diseases.[17,18] Only one Brazilian study has assessed QOL in psychiatric patients and this was in a small sample of 20 autistic children between 4 and 12 years old. Surprisingly, it concluded that the autistic children had levels of QOL similar to normal children.[19] Due to the paucity of research, further investigation on the QOL of Brazilian children and adolescents and the impact of psychiatric disorders is needed.

It is well known that there are very large differences in economic, socio-cultural and educational levels between children and adolescents living in different areas of the Brazilian cities.[20] These gaps are especially profound between the middle- and higher-class central areas and the poor outer-city areas. In contemporary Brazilian society, although it is possible to find middle-class teenagers going to schools and having leisure activities that are very similar to those in Europe and North-America, the scene in the outer-city areas is quite different. These are areas dominated by low social status, violence, drug dealing, low educational level of parents, unemployment, unsatisfactory health standards, and scanty leisure opportunities.[21] Although some studies have reported an association between neighborhood disadvantage and worse mental health in children and adolescents in developed countries,[22] the consequences of living in poorer neighborhoods for the mental health and QOL of pre- and early adolescents in Brazil have not been thoroughly investigated.

In addition, in the Brazilian society, religion seems to be a central dimension of personal and cultural life, as well as one of the main sources of values and social networks.[23] Particularly for adolescents, religious participation and ideologies are frequently mentioned as important in their lives.[24] Religion can foster socialization, set values of good behavior and may also promote mental health and QOL.[24] A number of investigations in other countries have shown that religious involvement and commitment play an important role in mental health and QOL for adults and the elderly.[25] It is therefore important to discover whether these dimensions of personal and cultural life are also associated with mental health and QOL in adolescents.

Objective

The present study aimed to estimate the prevalence of mental health problems and the QOL of pre- and early adolescents living in two contrasting areas of Campinas-SP, Brazil. It aimed to test the hypothesis that adolescents' mental health and QOL are associated with neighborhood disadvantage by comparing the two areas of the city (central and outer-city).

Additionally, it aimed to examine the association between gender, sociodemographic, and religious factors and mental health problems, QOL and school performance.

Method

1. Setting

The study was carried out in Campinas, a city of 970,000 inhabitants, located in the Southeast region of the country, about 90 km from the city of São Paulo. Campinas is characterized mainly by its rich industrial activities (the surrounding region being responsible for 14% of the Brazilian GDP), good availability of public and private health services, and by the presence of three universities. Campinas has attracted many migrants from poorer areas of Brazil during the last 30 years. This fact, along with an enduring economic crisis in Brazil, has resulted in the development of contrasting neighborhoods in the city, as well as an increase in violence (66.7 homicides/100,000 inhabitants in the year 2001, the sixth most violent city in the country).

2. Design

This study was a school-based, cross-sectional survey of pre- and early adolescents from two different socioeconomic areas in a Brazilian industrialized city.

3. Sample and sampling strategy

A pilot study, which involved one school in a central region and one school in an outer-city area, was first performed to calculate sample size, test the QOL instrument and the comprehension of younger students (5th grade). Sample size was obtained comparing the estimated prevalence of mental problems in the two regions, using the method for size sample calculation for estimation of differences in proportions. It was found an estimated prevalence of 35% in the central region and 45% in the outer-city area. From this pilot study, it was determined that the sample size required for a study with a power of 80% and a significance level of 5% (alpha = 0.05) was 746 subjects, or 373 subjects per group.

The sampling strategy was to deliberately include two socio-economically contrasting regions of the city: the better-off central area and the poorer outer-city area. Hence, two regions representative of typical central areas and two regions representative of typical outer-city areas were chosen. Then two public schools in each region were randomly selected. Finally, in each of the schools, classes from the 5th to 8th grades were randomly selected. The data were collected between February and October 2002.

4. Participants

The total population of students from all classes randomly selected comprised 1,003 subjects. Of these, 157 were not present on the day the research was conducted (15.6%) and 32 refused to participate in the study (3.2%), so that the possible sample comprised 814 subjects (81.2% of the total population of students). In the four schools, the refusal rates were very similar (varying from 2.8 to 3.7%), as was the number of absent students (14.3 to 15.6%). Of the 814 subjects, three individuals from the 8th grade were excluded because they were over 16 years old. Thus the final sample comprised 811 early adolescents, 417 (51.2%) from central area and 394 (48.8%) from the outer-city area. These pre- and early adolescents had a mean age of 12.6 ± 1.3 years, with a range from 10 to 16, median 13 years, (23% ⩽ 11 years; 23% = 12 years; 27% ⩾ 13 years; 27% ^{3} 14 years). Of the final sample of 811 students, 5.5% were 10 years old (45 5th grade students), all of whom were very close to being 11 years old. As they didn't seem to have any problems to understand and complete the questionnaires, they were maintained in the study. The gender distribution was 424 (52%) boys and 387 (48%) girls.

5. Measures

These were two self-completed instruments (SDQ and QOL) and a sociodemographic questionnaire. After a short explanation, the instruments were distributed to all students in their classrooms. The students filled in the questionnaires by themselves in the presence of the investigators (a child psychiatrist and two psychologists previously trained with the instruments), who stayed in the classroom during the whole time to answer any questions.

Teachers were also invited to take part in the study, using the teacher-version of the SDQ and by giving a global estimate of the school performance of the students. Forty-six teacher SDQs were missing, so the final sample, for which both student and teacher versions of the SDQ were available was 765 subjects. We tested whether this loss could interfere with the results. However, this was not the case: when all cases were included (sample of 811), 80 subjects with any probable mental health problem (9.8%) were found, being 35 cases from the central regions (8.4%) and 45 cases in the outer-city (11.3%). In the sample of 765 subjects, the rate of any probable mental health problem was practically the same: 10.1% (77 individuals), of these, 34 (8.6%) were from the center regions and 43 from the outer-city (11.3%).

6. Mental health status

Both self-report and teacher versions of the SDQ,[7] as well as the impact supplement (severity level) were completed by 765 adolescents and their teachers. The SDQ was validated for Brazilian children and adolescents by Fleitlich et al.[26] For the final prediction of probable mental health problems, the SDQ algorithm was used. This algorithm is a computer-based procedure that considers both answers from the students and their teachers, and factors in the impact of symptoms on the life of subjects. The SDQ algorithm produces three final predictions: 1) mental disorder improbable; 2) mental disorder possible; and 3) mental disorder probable. These three predictions are applied to four overall diagnostic categories: 1) conduct disorders; 2) emotional disorders; 3) hyperactivity disorder-ADHD; and 4) any mental disorder (this includes 1-3).

7. Quality of life

QOL was assessed using the Quality of Life Inventory (*Inventar zur Erfassung der Lebensqualität-ILK*, Mattejat et al.[11]), a self-completed disorder-nonspecific QOL instrument for children and adolescents aged 10 years old or older, which includes the following dimensions: school, family, friendship, autonomy, physical health, and mental

health. The adolescents were asked *how satisfied they were/ how well they felt* in each of these dimensions. The values range from "1 = very good" to "5 = very bad". The ILK was translated into Portuguese, back translated and culturally adapted by a group coordinated by Prof. Christoph Käppler (University of Zurich).[27]

8. School achievement, sociodemographic and religious data

School achievement was investigated by asking the teachers to estimate globally the students' school performance, ranging from 0 to 10 (the best performance). Sociodemographic and religious data were obtained through a questionnaire especially designed for this study.

9. Procedures

Interviewers visited the randomly selected schools and classes after asking the principals, teachers and students for permission to administer the questionnaires. A standardized explanation of the purpose of the investigation was given using a teens' sensitive approach. Then, two questionnaires consisting of sociodemographic and religious items were given to each student. After this initial contact, subjects were asked to fill in a mental health SDQ and QOL (Quality of Life Inventory).

10. Statistical analysis

In order to describe the sample profile, frequency tables of categorical variables were done. Descriptive statistics for the continuous variables were performed. The SAS System for Windows, version 8.01 was used for statistical analysis, using a level of $p \leqslant 0.05$ to denote a significant difference for the chi-square test, Fisher's exact Test and Mann-Whitney non-parametric test. To evaluate the internal consistency of the QOL measure, Cronbach Alpha coefficient was used.

To study factors influencing the mental health status and QOL of our subjects, sociodemographic, family, cultural and economic variables were tested: gender, age, race (white, Afro-Brazilian, Asian), locality of residence (central area or outer-city area), school achievement, currently having a religion, church attendance, religious education during childhood, parent's marital status, parent's educational level, parent's employment and economic status (estimated by the number of household appliances). Initially, a univariate logistic regression analysis was conducted to identify the relationship of each variable of interest with the total score of QOL, Mental Health Status and School Achievement. Secondly, a multivariate analysis was performed, using the stepwise criterion for variable selection. For mental health status, this variable was divided into improbable versus possible and probable. In the case of QOL and School Achievement, the cutoff was the median value of the sample. As QOL and mental health are variables that showed a strong relationship between themselves (due to their conceptual overlap, as the QOL instrument contains a subitem of mental health), they were not included in their respective analyses.

11. Ethical approval and consent

Ethical consent was obtained from the Ethics Research Committee of the Universidade Estadual de Campinas (Process' number = 299/2000). The Department of Education of Campinas was contacted in order to obtain authorization for the study.

A "passive consent form" was used, in which parents who did not agree with the participation of their child had to sign a non-agreement form. This strategy for ethical procedures in school-based studies with adolescents has been used in previous studies and is increasingly considered acceptable.[28] A small number of parents (32) did not give their permission.

Results

1. Sociodemographic data

From the central areas, a subsample of 417 students was obtained, and there were 394 subjects from the outer-city area. The comparison of sociodemographic data showed that the two regions of Campinas (central and outer-city) were highly different in their profiles (Table 1).

Table 1 - Sociodemographic variables recorded in central and outer-city areas for adolescents from Campinas

Variables	Central areas	Outer-city areas	Total	p
Sociodemographic variables	(n = 417) (51.2%)	(n = 394) (48.8%)	(n = 811) (100%)	n.s.
Age (mean, sd, extremes and median)	12.5 ± 1.4 (10-16) 13	12.7 ± 1.3 (10-16) 13	12.6 ± 1.3 (10-16) 13	0.06[1]
Gender (males/females)	M: 219 (52.5%)	M: 205 (52.2%)	M: 424 (52.3%)	n.s.
	F: 198 (47.5%)	F: 189 (47.8%)	F: 387 (47.7%)	
Race				
White	279 (67.8%)	158 (40.3%)	437 (54.4%)	
Afro-Brazilians	119 (28.9%)	228 (58.2%)	347 (43.1%)	0.001[2]
Asian	14 (3.4%)	6 (1.5%)	20 (2.5%)	
Father's educational level (years of formal education)	11.5 ± 4.16	5.3 ± 3.5	7.3 ± 5.1	0.001[1]
Divorced parents	146 (36.2%)	124 (33.3%)	270 (33.3%)	n.s.
Father formally employed	255 (65.2%)	181 (51.3%)	436 (53.7%)	0.001[2]
Number of household appliances (n, sd)	7.7 ± 1.6	5.6 ± 1.8	6.7 ± 1.7	0.0001[1]
Having a religion (yes/no)	363 (87.0%)	304 (77.7%)	667 (82.5%)	0.001[2]
Religious commitment				
Very religious	100 (25.6%)	108 (32.5%)	208 (28.7%)	
Moderate	216 (55.2%)	126 (38.9%)	342 (47.3%)	0.001[2]
Weakly religious	61 (15.6%)	76 (22.9%)	137 (19.0%)	
No religion	14 (3.6%)	22 (6.6%)	36 (5.0%)	
Religious education in childhood				
Very religious	109 (27.4%)	116 (31.6%)	225 (29.5%)	
Religious	149 (37.5%)	88 (23.9%)	237 (31.0%)	0.001[2]
Weakly religious	113 (28.4%)	107 (29.1%)	220 (28.8%)	
No religion	26 (6.5%)	56 (15.2%)	82 (10.7%)	

[1] Mann-Whitney u-test, [2] Chi-square test

2. Prevalence of mental health problems, QOL and neighborhood differences

Applying the SDQ algorithm for 765 subjects for whom both self-report and teacher versions were complete, including impact, it was obtained an estimate for the category "probable mental health problems" of 77 (10.1%) cases. Fifty-three (6.5%) subjects had conduct problems, 24 (3.1%) had emotional problems, and three (0.4%) had ADHD (attention-deficit and hyperactivity disorder) symptoms.

When the two contrasting areas of Campinas were compared, in spite of all the sociodemographic differences, no statistically significant difference was found either in the overall prevalence of mental health problems or in the global QOL (Table 2). However, the school achievements were significantly poorer among the adolescents living in outer-city areas.

3. Gender differences

Boys reported better global QOL than girls, due to better results in the "mental health-QOL" subscale and greater satisfaction with family life; on the other hand, girls reported better QOL in the school domain (Table 3). Furthermore, girls had significantly better school achievements rated by their teachers.

There were no gender differences in overall behavior problems rates. But, as expected, boys had a significantly higher rate of conduct problems and girls had a higher rate of emotional problems (Table 3). When boys and girls were separately compared in each neighborhood area, a similar profile of mental health was found in the central area, with non-significant gender differences in the overall prevalence of any probable mental health problem. Thus, in the central areas the overall prevalence for any behavior problem was 8.6% for boys vs. 8.4% for girls (for conduct problems: 6.2% vs. 5.8%, for ADHD symptoms: 0.5% vs. 0.5%, and emotional problems: 2.3% vs. 3.1%). However, the classical gender effects were obtained in the outer-city region: significantly higher rate of emotional problems among girls (5.7% vs. 1.5%, p = 0.03), and higher rate of conduct problems for boys (12% vs. 3.4%, p = 0.002).

Moreover, comparing just the boys from the two areas, a significantly higher prevalence of conduct problems was found among boys from the outer-city areas in comparison to boys from the central region (12% vs. 6.2%; p = 0.04). Boys from the outer-city area also performed worse in school achievements when compared to boys from the central area (5.3 vs. 6.0; p = 0.001). On the other hand, girls from the two regions (central and outer-city) didn't differ significantly in mental health status, and even showed similar levels of school performance (6.45 vs. 6.46), in spite of all the social differences. There were no differences among girls of the two areas in school achievements (6.45 vs. 6.46).

Stepwise multiple regression analysis

1. Mental health

Through the multivariate analysis shown in Table 4, it was possible to determine the risk factors for adolescents with the poorer mental health. They were males, had no religion, and had divorced parents.

2. Quality of life and school achievements

In order to identify which variables were associated with QOL and School Achievements, two multivariable logistic regression models were applied. For QOL, no variables of the dimensions of mental health (SDQ) or school achievements were included in the final models (Table 5). The worst QOL profile was reported by the subgroups which had no or less religious education during their childhood, those who currently declared having no religion and those in the lower socioeconomic status.

Discussion

The overall rate of probable mental health problems found in an industrialized city of the Southeast region of Brazil using the screening instrument SDQ was 10%. Within the two city areas investigated (central and outer-city), although remarkable social disparities were evident, no significant differences were found in the overall rate of probable psychiatric cases (central: 8.5% vs. outer-city: 11.7%) or global QOL levels. This was surprising, because in other studies performed in Brazil both with adults[29-31] and children[1-5] significantly higher rates were found in disadvantaged neighborhood areas.

It is important to consider some methodological limitations of the present study. Firstly, this study used a screening instrument that included only two informants: subjects themselves and their teachers. The lack of a third source of information – the parents – may have caused false negative

Table 2 - Estimated prevalence rates (SDQ scores) and QOL recorded in central and outer-city areas for pre- and early adolescents from Campinas

Variables	Central areas	Outer-city areas	Total	p
Psychiatric case by the SDQ	**n = 399**	**n = 366**	**n = 765**	
Any problem	34 (8.5 %)	43 (11.7 %)	77 (10.1%)	n.s. [1]
Emotional problem	11 (2.7 %)	13 (3.5 %)	24 (3.1%)	n.s. [1]
Conduct problem	24 (6.0 %)	29 (7.9 %)	53 (6.5%)	n.s. [1]
ADHD symptoms	2 (0.5 %)	1 (0.3 %)	3 (0.4%)	n.s. [2]
Global QOL (1 = very good to 5 = very bad)	**n = 417**	**n = 397**	**n = 811**	
Global QOL mean (SD)	1.7 (0.9)	1.6 (0.8)	1.7 (0.9)	n.s. [3]
School	2.3 (1.0)	2.1(1.0)	2.2 (1.0)	0.0005
Family	1.5 (0.7)	1.5 (0.8)	1.5 (0.8)	n.s. [3]
Friends	1.4 (0.6)	1.6 (0.8)	1.5 (0.7)	0.0004
Autonomy	2.0 (1.1)	2.3 (1.2)	2.1 (1.2)	0.0002
Physical health	1.6 (0.9)	1.6 (0.9)	1.6 (0.9)	n.s. [3]
Mental health	1.9 (1.0)	1.9 (1.0)	1.9 (1.1)	n.s. [3]
School achievement	6.2 (1.7)	5.9 (1.8)	6.1 (1.8)	0.012 [4]

1. Chi-square Test; 2. Fisher's exact Test; 3. Mann-Whitney U-test; 4. T-Test.
Internal Consistency analysis (Cronbach) for QOL = 0.6206

Table 3 - Gender differences in mental problems prevalence (SDQ) and QOL of pre- and early adolescents from Campinas-SP, Brazil

Variable	Boys (n = 400)		Girls (n = 365)		
Psychiatric Case by the SDQ	**n**	**%**	**n**	**%**	**p**
Any problem	45	11.2%	32	8.7%	ns[1]
Emotional problem	8	2.0%	16	4.4%	0.05[1]
Conduct problem	36	9.0%	17	4.7%	0.01[1]
ADHD symptoms	2	0.5%	1	0.2%	ns[2]
QOL/ Dimensions[3]	**Mean**	**SD**	**Mean**	**SD**	**p**
Global QOL	1.61	0.85	1.74	0.92	0.04
School	2.31	0.97	2.12	0.97	0.003
Family	1.35	0.68	1.60	0.89	0.0001
Friends	1.47	0.74	1.49	0.76	ns.
Autonomy	2.09	1.22	2.14	1.18	ns.
Physical Health	1.56	0.83	1.68	0.94	ns.
Mental Health	1.77	0.94	2.07	1.16	0.0007
School achirevement[3]	5.7	1.8	6.5	1.6	0.0001

For SDQ prevalence: 1. Chi-Square test, 2. Fisher's exact test. 3. Test Mann-Whitney. Internal Consistency Analysis (α Cronbach) = 0.62 (intermediary consistence)

cases. Secondly, the lack of differences in mental health and global QOL in the two contrasting areas of Campinas may be in part due to our sampling strategy. Because we included subjects who were at school, it is possible that a subgroup of pre-adolescents in the worst psychosocial conditions were not included in this study. Moreover, our school sample is not representative of all schools in Campinas, since we did not include private schools from central areas, attended by adolescents from the upper middle classes and upper classes. Therefore, it is possible that we have compared subjects from the poorer groups with those from low-middle and middle classes, excluding extremes. This could explain these negative results. Against this possibility, nevertheless, the two areas were nonetheless very different on almost all social and socioeconomic variables. In the central area, adolescents were mostly white, their parents had higher educational levels, were more often formally employed, and their homes had far more household appliances.

Surprisingly, in the present study the rate found for hyperactivity symptoms was very low. Apart from presumably reflecting an age effect (54% of the sample aged 13 years or older), this low rate may have occurred due to the lack of parents as informants. The author of SDQ, Robert Goodman, has pointed out that the sole use of teacher ratings and self-reports reduces considerably the sensitivity of the SDQ prediction for hyperactivity disorders to 59%.[7] Therefore, some cases of hyperactivity may have been lost or could have been diagnosed in the encompassing spectrum of conduct disorder.

Having no religion, divorced parents and being male were the factors associated with a worse mental health profile. Family structure has been traditionally suggested as a critical aspect of neighborhood. One indicator of neighborhood disadvantage is, besides poverty, mother-only households. Two-parent families are expected to provide much more stability even in the presence of poverty.[32] In our study, where family structure was investigated considering parent's conjugal status, it was found that the subjects whose parents were divorced had more psychiatric morbidity.[32-33] The present study showed that this was especially evident when considering conduct problems, which were more prevalent in the outer-city areas and in boys.

QOL, gender and mental disorders

This is the first study in Brazil that investigated QOL in children and adolescents in a non-clinical, community setting, and that explored QOL concomitantly with mental health.

The present study found that gender was an important factor influencing QOL, mental health and school achievements.[13,14] In child and adolescent psychiatric epidemiology, it is well

Table 4 - Stepwise multiple regression analysis for any psychiatric problem, emotional problem, conduct problem and ADHD symptoms (improbable vs. possible and probable)

Variables	Comparison levels*	p	OR	95% CI
For any psychiatric problem (improbable n = 533)				
No religion group	no/yes	0.0044	2.12	1.26-3.56
Parents' marital status	divorced /married	0.0129	1.60	1.11-2.33
	others (Dead)/married	0.9145	0.90	0.12-6.77
Gender	male /female	0.0209	1.52	1.07-2.16
For emotional problem (improbable n = 627)				
Religious education during childhood	religious/very religious	0.1557	1.60	0.84-3.08
	weakly or no religious/very religious	0.0045	2.43	1.32-4.48
For conduct problem (improbable n = 533)				
Gender	male /female	0.0055	1.67	1.16-2.40
Parents' marital status	divorced /married	0.0059	1.70	1.17-2.48
	others (Dead)/married	0.8300	1.25	0.17-9.39
No religion group	no /yes	0.0188	1.85	1.11-3.08

Comparison levels / Reference levels; Abnormal Mental Health (n = 228); Normal Mental Health (n = 305)
*** OR = Odds Ratio for Abnormal Mental Health; IC95% = Confidence Interval of 95%*

Table 5 - Stepwise multiple regression analysis for worst quality of life-QOL and school achievements

Variables	Comparison levels*	p	OR	95% CI
For worst QOL (n = 557)				
Religious education during childhood	Religious ed./very religious ed.	0.4402	1.20	0.75-1.93
	weakly or no religious ed./very religious ed.	0.0202	1.75	1.09-2.80
Religious commitment	moderate/very religious	0.0002	2.37	1.51-3.71
	Weakly or no religious/ very religious	0.0103	2.03	1.18-3.49
Number of items at home	0-5/9-11 items	0.0021	2.39	1.37-4.17
	6-8/9-11 items	0.0575	1.58	0.99-2.53
For worst school achievements (n = 390)				
No religion group	no/yes	0.0041	5.21	1.69-16.10
Religious education during childhood	moderate religious ed./very religious ed.	0.8155	1.08	0.58-1.99
	weakly or no religious ed./ very religious ed.	0.0253	1.98	1.09-3.61
Gender	male/female	0.0207	1.72	1.09-2.73
Religious denomination	No denomination/Catholic	0.7071	0.78	0.21-2.88
	Protestant/Catholic	0.2291	1.38	0.82-2.33
	Spiritist and Other religions /Catholic	0.0192	3.53	1.23-10.16

**Comparison levels / Reference levels; Worse QOL – score ≤ 1.71 (n = 231); Better QOL – score > 1.71 (n = 326); Worse School Achievement – score < 6 (n = 120); Better School Achievement – score ≥ 6 (n = 270)*
*** OR = Odds Ratio for Abnormal Mental Health; IC95% = Confidence Interval of 95%*

established that boys have more externalizing disorders (hyperactivity, conduct disorder, aggressive, and antisocial behavior) and girls tend to have more internalizing disorders (depression, anxiety, somatization, and lower self-esteem).[34,35] Although girls described themselves as having a worse QOL than boys, female gender was actually associated with better mental health and better school performance. The fact that girls have presented more emotional symptoms, which are subjectively perceived, and boys have more conduct problems, which frequently are not noticed by them, may be a factor of this incongruence between perceived QOL and actual profiles in mental health screening and school performance.[12] A similar result was found by Schubert et al. using the same instrument for QOL applied in the present study. In his investigation, mothers of children and adolescents with attention deficit/hyperactivity disorders and/or conduct disorder more often tended to judge their children's QOL as unsatisfactory in all domains, whereas the children themselves did not.[16]

Whereas living in the outer-city of Campinas enhanced gender differences in the prevalence of probable mental problems, living in the central areas of the city seems to level out such differences. This finding is difficult to interpret, although studies conducted in highly developed countries such as Norway and old East Germany[36,37] have also shown almost no gender differences in child and adolescent mental disorder prevalence. Thus it is possible, though speculative, that better socioeconomic conditions lead to a flattening in gender differences in mental health disorders among early adolescents.

Interestingly, living in the poorer areas seemed to affect boys more negatively than girls. A significantly higher prevalence of conduct problems was found among boys from the outer-city areas in comparison to boys from the central regions (almost double the prevalence: 12.0% vs. 6.2%). Indeed girls from these two areas showed identical levels of school performance, despite the outstanding socioeconomic differences of their families.

Therefore, boys living in the poor neighborhoods of Brazilian cities may be particularly vulnerable for conduct disorders. It is possible that a subgroup of such pre- and early adolescents with conduct problems will be (or is already) progressively involved with criminality (drug dealing, stealing, criminal violence etc.). Such group of boys should be considered as a high priority group for mental health prevention, treatment, and educational interventions.

Religion, mental health and QOL

Religious variables showed a significant association with mental health, school achievements and QOL. Considering themselves as religious persons, having a religious affiliation, a stronger religious commitment, and receiving a religious education during childhood were associated with better mental health, QOL and school achievements. This is the first study to examine such factors in children in a developing country.

Regarding religious involvement, the pre-adolescents who declared to be non-religious also had a higher prevalence of psychiatric problems. Weak religious commitment was associated with worse QOL and school performance as well. These results indicate that religious involvement has the same or stronger effects amongst pre- and early adolescents as it has amongst adults and the elderly.[25]

Interestingly, in the present study, the pre-adolescents who declared receiving no or a weak religious education during childhood tended to be the same group that showed more emotional symptoms, worse QOL, and worse school performance. Recently, our research group[38] conducted a similar study with late adolescents and young adults and also found that religious education during childhood was related to a better mental health profile. Although it is difficult to interpret these results with certainty, it is plausible that religious education and family religious commitment in the childhood years may have an enduring effect on mental health.

Scheepers et al. demonstrated through an extensive cross-cultural study (including data from 15 countries and 16,604 subjects) that religious and moral values and attitudes shared by parents during the socialization years appear to increase rather than decrease as people grow older.[39] Pearce and Axinn investigated the impact of family religious life over the emotional bond between children and their mothers.[40] Using data from the International Panel Study of Mothers and Children and from the National Survey of Youth, they found that although religious affiliation in different denominations was not related to family structure and function, religious involvement and commitment of the family had a decisive impact over the quality of mother-child relationship. Therefore, family processes during childhood modulated by religion may have an enduring

influence over mental health, socialization and even QOL and school performance.

Conclusion

For adolescents, living in outer-city areas of an industrialized city in the Southeast region of Brazil was not associated with poorer mental health and QOL *per se*, unless when variables such as male gender, lack of religion and divorced parents were considered. Although girls have better school achievements and fewer conduct problems, they report lower QOL, possibly influenced by a higher prevalence of emotional problems.

Religion proved to be an important factor related to mental health, QOL and even to school achievement in pre- and early adolescents. A possible protective effect of religious education during childhood may be operating. This interesting finding should be carefully investigated in future studies.

This study has identified that a considerable proportion of boys living in outer-city areas have conduct problems. This group of adolescents should become the focus of public health concerns.

Acknowledgements

We would like to thank the psychologists Renata Bellenzani and Maria Camila Maselli for their help with the collection of data.

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