

Common mental disorders in adolescents: a population based cross-sectional study

Transtornos mentais comuns em adolescentes: estudo transversal de base populacional

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Abstract

Objective: To assess the prevalence and the factors associated with common mental disorders among adolescents in Pelotas, a southern Brazilian city. **Method:** A population based cross-sectional study was carried out in the urban area of Pelotas. Multi-stage sampling was used to obtain a sample of adolescents aged between 15 and 18 years. Adolescents were interviewed using a self-report confidential questionnaire. The presence of common mental disorders was assessed using the Self-Reporting Questionnaire 20 (SRQ-20). Multivariate analysis was carried out using the Poisson regression with a robust adjustment of variance and control for design effect. **Results:** Nine hundred and sixty adolescents were interviewed. The prevalence of common mental disorders was 28.8%. Adolescents aged 17 years showed prevalence of 1.37 (95% CI 1.06-1.78) times greater than the 15 year olds. Adolescents whose mothers had between 5 and 8 years of schooling had a prevalence 1.42 (95% CI 1.01-1.51) times greater than those whose mothers had more than 8 years of schooling. Smoking and sedentary behavior were also associated with an increased prevalence of common mental disorders. Those who were dissatisfied with their body image showed a prevalence of 1.47 (95% CI 1.07-2.02). **Conclusions:** Maternal schooling, tobacco smoking, sedentary behavior and body image dissatisfaction were factors associated with the presence of common mental disorders.

Descriptors: Mental disorders; Stress, psychological; Adolescent; Prevalence; Adaptation, psychological

Resumo

Objetivo: Avaliar a prevalência e os fatores associados à presença de transtornos mentais comuns entre adolescentes em Pelotas, uma cidade do sul do Brasil. **Método:** Foi realizado um estudo transversal populacional na área urbana de Pelotas. Foi utilizada uma amostragem multi-etapas para obter uma amostra de adolescentes com idades entre 15 e 18 anos. Os adolescentes foram entrevistados utilizando um questionário confidencial auto-aplicável. A presença de transtornos mentais comuns foi avaliada utilizando o Self-Reporting Questionnaire 20 (SRQ-20). Foi realizada análise multivariada por meio de regressão Poisson com ajuste robusto da variância e correção para efeitos de desenho. **Resultados:** Novecentos e sessenta adolescentes foram entrevistados. A prevalência de transtornos mentais comuns foi de 28,8%. Os adolescentes com 17 anos mostraram prevalência de 1,37 (IC 95% 1,06-1,78) vezes mais alta do que os que tinham 15 anos. Os adolescentes cujas mães tinham entre cinco e oito anos de escolaridade tinham uma prevalência 1,42 (IC 95% 1,01-1,51) vezes mais alta do que aqueles cujas mães tinham mais de oito anos de escolaridade. Tabagismo e comportamento sedentário também foram associados à maior prevalência de transtornos mentais comuns. Aqueles que estavam insatisfeitos com sua imagem corporal tiveram uma prevalência de 1,47 (IC 95% 1,07-2,02). **Conclusões:** Escolaridade materna, tabagismo, comportamento sedentário e insatisfação com a imagem corporal foram fatores associados à presença de transtornos mentais comuns.

Descritores: Transtornos mentais; Estresse psicológico, Adolescente; Prevalência; Adaptação psicológica

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Introduction

The concept of Common Mental Disorders (CMD) was defined by David Goldberg, and it includes depressive non-psychotics symptoms, anxiety and somatic complaints that affect the performance of daily activities. The symptoms included in this category are the following: difficulty in concentrating and forgetfulness, insomnia, fatigue, irritability, feeling of inutility, and somatic complaints, among others. Psychotic disorders, chemical dependence or personality disorders are not included in this category.¹ This concept is very often used, especially in population studies.²⁻⁵ These disorders are commonly found in the general community and are a problem in both social and health areas.⁶

In Recife, northeastern Brazil, 35% of individuals aged 15 to 55 years had CMD. The main risk factors were low schooling and poor housing. In southern Brazil, Lima et al. evaluated a representative sample of the population aged 15 years or older.⁷ The prevalence of CMD was 22.7% (17.9% males and 26.5% females) and increased with age. Furthermore, the prevalence of CMD was higher among low socioeconomic groups.⁸

A study carried at outpatient clinics with the general population in 1987 found a prevalence of the disorder, measured by Self Report Questionnaire (SRQ-20), between 15% and 50%.⁶

Our literature review was carried out using databases such as Medline, SciELO, and Pubmed. We did not find any Brazilian population-based study that assessed the prevalence and the risk factors for CMD specifically among adolescents. Therefore, we included studies with adults. Mental disorders can occur at any age. However, many severe cases usually have non-specific early manifestations during adolescence, like CMD. Early intervention in these cases, as well as in other mental health disorders, may significantly improve the prognosis for recovery. The perpetuation of CMD can be damaging to relationships and labor life throughout the individual's life cycle, with great impact on the social and economic aspects.¹

The objective of this study was to describe the prevalence and the associated factors of CMD among adolescents in a southern Brazilian city.

Method

1. Selection and description of participants

A cross-sectional population-based study was carried out between December 2001 and June 2002 in the urban area of Pelotas (population 320,000), a southern Brazilian city. The study covered a representative sample of the population aged between 15 and 18 years. The city is located near the border with Uruguay, about 100 Km of distance.⁹

A systematic sample of 90 of the city's 448 census tracts was selected. In each tract, a starting point was randomly chosen, and 86 households were systematically visited. An attempt was made to interview all adolescents aged between 15 and 18 years living in these 7,740 households. Refusals were not replaced.

2. Technical information

The sample size was estimated to detect a prevalence ratio of 2.0 with 80% of power at the 5% significance level, adding 30% to allow for adjustment for confounding and a further 10% for refusals. The expected prevalence was 20% of CMD.

All subjects answered a confidential self-administered questionnaire, which included questions about socioeconomic

conditions, age, any paid work, sexual behavior, driving habits, smoking habits, alcohol and drug consumption, religion, physical activity, and dietary habits.

Socioeconomic level was assessed using the classification proposed by the Brazilian Association of Market Research Institutions (ABIPEME). This classification is based on the accumulation of material goods and the schooling of the head of the household and places the subjects into classes (A, B, C, D and E) according to the scores obtained.

CMD was measured with the Self-Report Questionnaire (SRQ-20), which was validated by Mari and Williams. SRQ-20 was designed by the World Health Organization and consists of twenty yes-no questions (four about physical symptoms and sixteen about psychological-emotional disorders, considering the past 30 days). The CMD are, in fact, a category created by David Goldberg. This category includes non-psychotic symptoms such as depression, anxiety, and somatic complaints. Male who had six or more positive answers and female who had seven or more positive answers were considered positive for common mental disorders.

3. Statistics

We used the chi-square test with the Yates correction for 2 x 2 tables in order to make comparisons between proportions.¹⁰ Poisson regression with a robust adjustment of variance and control for the design effect was used in the multivariate analysis. This type of analysis was chosen because the outcome prevalence was greater than 10%, which can lead to overestimation of odds ratios, a measure obtained using logistic regression.¹¹

When the odds ratio overestimates the risk relative, and this overestimation increases, to the measure where it increases the prevalence of outcome.

The prevalence ratio was estimated using Poisson regression with robust adjustment of the variance, with design effect control (cluster command in Stata was used).

In the multivariate analysis, independent variables were introduced according to predetermined causality levels, starting with distal determinants and adding, in a stepwise fashion, intermediate and proximate determinants.¹²

The first level included adolescent's age and mother's schooling. The second level included living with parents. The third level included adolescent's schooling and the fourth level included the number of cigarettes smoked per day, sedentary behavior, and body satisfaction. A backward selection was used, and all variables with $p \leq 0.20$ were kept in the model. A high p value was used to prevent residual confounding.

This study was focused in adolescents of different ages and is associated with educational level. Therefore, age could confound the results of schooling.

This study was approved by CP/UCPel; Process n 0347-2/01- EM.

Results

We identified 1,039 adolescents, aged 15 to 18 years, of whom 79 (7.6%) either refused or could not be interviewed after at least three attempts on different days. The prevalence of CMD was 28.8%.

The prevalence of CMD was 1.87 (95% confidence interval: 1.51-2.33) times higher among women (Table 1). Low socioeconomic status was also related to a higher prevalence of CMD. On the other hand, age was not associated with CMD. As observed regarding parental schooling, those adolescents with less than 4 years of education presented the

Table 1 – Prevalence of CMD versus socioeconomic variable, familiar context and schooling, prevalence ratio (PR) and CI for gender without adjustment and adjusted for variables included in the hierarchical level. Final Hierarchical Model to CMD of both genders and 95% CI

Variable	PR for male CI (95%)	PR for female CI (95%)	PR for male CI (95%)*	PR for female CI (95%)*	PR for both genders CI (95%)*
Gender					
Male		Reference			
Female		1.87 (1.51-2.33)			
Age					
15 years	Reference	Reference	Reference	Reference	Reference
16 years	1.39 (0.75-2.56)	1.23 (0.85-1.79)	1.36 (0.73-2.51)	1.18 (0.82-1.68)	1.31 (0.96-1.80)
17 years	1.31 (0.77-2.23)	1.41 (1.06-1.88)	1.32 (0.76-2.27)	1.40 (1.05-1.85)	1.37 (1.06-1.78)
18 years	1.30 (0.69-2.42)	1.01 (0.72-1.40)	1.28 (0.69-2.39)	0.99 (0.71-1.36)	1.08 (0.79-1.48)
Social class					
A or B	Reference	Reference			
C	1.82 (0.67-2.07)	1.66 (1.22-2.16)			
D or E	1.00 (0.64-1.56)	1.28 (0.93-1.75)			
Father's schooling					
0 to 4	1.27 (0.73-2.20)	1.75 (1.31-2.33)	**	**	**
5 to 8	1.10 (0.67-1.80)	1.66 (1.27-2.16)			
9 or more	Reference	Reference			
Mother's schooling					
0 to 4	1.26 (0.77-2.08)	2.08 (1.47-2.95)	1.22(0.74-2.01)	2.09 (1.46-2.97)	1.35 (1.00-1.80)
5 to 8	1.20 (0.73-1.94)	1.92 (1.38-2.65)	1.19(0.73-1.92)	1.91 (1.37-2.65)	1.42 (1.09-1.85)
9 or more	Reference	Reference	Reference	Reference	Reference
Living with parents					
Both	Reference	Reference	Reference	Reference	Reference
Father or mother	1.37 (0.89-2.09)	1.13 (0.86-1.49)	1.37 (0.88-2.11)	1.11 (0.85-1.45)	1.15 (0.90-1.48)
Neither of them	2.15 (1.35-3.43)	1.01 (0.65-1.56)	2.10 (1.32-3.34)	0.95 (0.62-1.46)	1.05 (0.87-1.53)
Adolescent's schooling					
0 to 4	2.59 (1.44-4.64)	1.65 (1.04-2.60)	2.70 (1.44-5.07)	1.25(0.77-2.05)	1.48 (0.94-2.31)
5 to 8	1.64 (1.08-2.49)	1.27 (0.99-1.64)	1.67 (1.02-2.73)	1.01(0.77-1.33)	1.14 (0.89-1.45)
9 or more	Reference	Reference	Reference	Reference	Reference

* Adjusted for variables included in the same hierarchical level

** Variables excluded in the hierarchical level

highest prevalence (Table 2). Tobacco smoking and sedentary behavior were associated with an increased risk for CMD. Prevalence of CMD was directly related to the number of cigarettes smoked daily. Oddly, intake of alcoholic beverages was not associated with the prevalence of CMD (Table 3).

In the multivariate analysis, after including maternal schooling in the regression model, paternal schooling and social class had their effect reduced and did not reach the level of significance necessary to be kept in the model. Those adolescents whose mothers completed less than 4 years of school presented a prevalence of CMD that was 1.35 (1.00-1.80) times higher than those observed among the adolescents whose maternal schooling was ≥ 9 years. Adolescents aged 17 years presented the highest prevalence of CMD (Table 1). After controlling for socioeconomic variables and presence of the parents in the household, the effect of adolescent schooling was reduced and the confidence interval included the unity, i.e., the association was no more statistically significant. Even after controlling for those variables included the previous levels, tobacco smoking and sedentary behavior remained associated with an increased prevalence of CMD. Adolescents who smoked more than 15 cigarettes per day had a prevalence 1.66 (95% confidence interval: 1.05-2.64) times higher than non-smokers. Body image dissatisfaction also remained associated with CMD. Adolescents who desired to be fatter had prevalence 1.48 (CI 1.07-2.02) times greater than those who were happy with their body (Table 4).

Discussion

This population based cross-sectional study provided a representative estimate of the prevalence of common mental

Table 2 – Distribution of the population, prevalence of CMD according to demographic and socioeconomic variables and p-value

Variable	n	CMD Prevalence	P value
Gender			
Male	463	19.9	< 0.01
Female	497	37.2	
Age			
15 years	227	24.2	> 0.05
16 years	271	31.0	
17 years	221	33.5	
18 years	241	26.6	
Social class			
A or B	346	23.9	< 0.05
C	366	27.9	
D or E	248	37.1	
Father's schooling			
0 to 4	211	35.1	< 0.05
5 to 8	406	31.3	
9 or more	343	22.2	
Mother's schooling			
0 to 4	198	35.8	< 0.01
5 to 8	416	32.9	
9 or more	345	20.0	
Living with parents			
Both	583	25.9	< 0.05
Father or mother	255	32.5	
Neither of them	122	35.0	
Adolescent's schooling			
0 to 4	52	44.2	< 0.05
5 to 8	351	32.5	
9 or more	557	25.1	
TOTAL	960		

Table 3 – Distribution of the population, prevalence of CMD according to health behavior and p-value

Variable	n	CMD Prevalence	P value
Mass frequency			> 0.05
Weekly	153	35.3	
Sporadic	295	28.1	
Never	512	27.3	
Illegal drugs (in the month)			< 0.05
Yes	83	32.5	
No	877	28.5	
Smoking (in the month)			< 0.01
Yes	157	42.1	
No	803	26.2	
Smoking (cigarettes per day)			< 0.01
0	769	25.6	
Less than 4	51	33.3	
5 to 15	87	39.1	
16 to 40	19	47.3	
Alcohol (in the month)			> 0.05
Yes	410	30.2	
No	538	27.7	
Sedentary			< 0.01
Yes	374	37.7	
No	586	23.2	
Body satisfaction			> 0.05
Satisfied	787	25.8	
Unsatisfied desiring to be thinner	79	32.9	
Unsatisfied desiring to be fatter	94	34.0	
TOTAL	960		

disorders and of their association with adolescents living in a southern Brazilian city. Furthermore, the low proportion of non respondents (7.6%) reduced the chance of selection bias. Possible limitations concerning the quality of information included the difficulty in reporting the CMD symptoms, even through a confidential, self-applied questionnaire. Another

limitation is the fact that SRQ-20, in spite of presenting a high sensitivity and specificity, is not completely accurate. Therefore, some people could have been wrongly classified as presenting CMD and, on the other hand, some adolescents who were found to be CMD negative, in fact, might have it. These possible information bias, however, are likely to have been non differential. Because the direction of bias produced by non differential misclassification of a dichotomous exposure is toward the null,¹³ i.e., the bias underestimated the prevalence ratio. If the prevalence of CMD had been more precisely assessed, an even stronger association might have been observed.

Similarly to other studies, we observed that low socioeconomic status is associated with an increased risk for CMD.¹⁴ The effect of sedentary behavior was probably due to reverse causality bias because depressed individuals are less prone to engage in physical activities. Prevalence of CMD was directly correlated with the number of cigarettes smoked daily, and development of nicotine dependence is the most probable explanation for such association. DiFranza reported that adolescents presented nicotine dependence symptoms after the first cigarettes smoked, and then increased smoking intensity in order to minimize dependence symptoms.¹⁵ The association of the number of cigarettes smoked and the nicotine dependence can reflect the fact that smoking can lead to the development of CMD, or this disorder increases the risk of becoming a regular smoker. For this reason, campaigns whose objective is helping adolescents to quit smoking should provide some kind of support such as cognitive therapy and anti-depressive medications.

This study, like the one conducted in Pernambuco, showed that schooling is associated with the presence of CMD, although poor conditions of living were not associated in our study.⁷

Table 4 – CMD Prevalence versus Health Behaviors, prevalence ratio (PR) and CI for gender without adjustment and adjusted for variables included in the hierarchical level. Final Model Hierarchic to CMD of both genders and 95% CI

Variable	PR for male CI (95%)	PR for female CI (95%)	PR for male CI (95%)*	PR for female CI (95%)*	PR for both genders CI (95%)*
Mass frequency					
Weekly	Reference	Reference	**	**	**
Sporadic	0.90 (0.49-1.65)	0.76 (0.55-1.05)			
Never	0.69 (0.39-1.22)	1.00 (0.73-1.35)			
Illegal drugs (in the month)					
Yes	1.55 (0.98-2.51)	1.00 (0.69-1.47)	**	**	**
No	Reference	Reference			
Smoking (in the month)					
Yes	1.86 (1.22-2.84)	1.36 (1.08-1.71)	**	**	**
No	Reference	Reference			
Smoking (cigarettes per day)					
0	Reference	Reference	Reference	Reference	Reference
Less than 4	1.20(0.51-2.85)	1.02 (0.76-1.87)	1.05 (0.50-2.20)	1.03 (0.61-1.74)	0.99 (0.65-1.52)
5 to 15	1.76 (0.69-4.48)	1.24 (0.87-1.77)	1.21 (0.49-2.99)	1.13 (0.80-1.58)	1.21 (0.89-1.66)
16 to 40	1.97 (1.14-3.38)	2.46 (1.69-3.57)	1.60 (0.87-2.93)	2.67 (1.59-4.48)	1.66 (1.05-2.64)
Alcohol (in the month)					
Yes	1.16 (0.81-1.44)	1.17 (0.95-1.44)	**	**	**
No	Reference	Reference			
Sedentary					
Yes	1.69(1.15-2.47)	1.25 (0.99-1.57)	1.73 (1.19-2.50)	1.12 (0.88-1.42)	1.24 (1.01-1.51)
No	Reference	Reference	Reference	Reference	Reference
Body satisfaction					
Satisfied	Reference	Reference	Reference	Reference	Reference
Unsatisfied desiring to be thinner	1.10 (0.48-2.54)	1.13 (0.80-1.60)	1.06 (0.33-1.62)	0.98 (0.63-1.28)	1.10 (0.80-1.52)
Unsatisfied desiring to be fatter	1.56 (1.05-2.32)	1.74 (1.15-2.63)	1.37 (0.49- 2.77)	1.42 (0.80-2.51)	1.48 (1.07-2.02)

* Adjusted for variables included in the same hierarchical level

** Variables excluded in the hierarchical level

We did not apply clinical interviews to subjects, and it represents a limitation in terms of categorically diagnosing CMD, because SRQ cannot establish the diagnosis. It only may suggest a risk. Although SRQ has been recommended as a screening instrument by the WHO, there are other instruments to detect the risk of CMD. Other centers in Brazil¹⁶ and Denmark¹⁷ used the General Health Questionnaire (GHQ) and CMDQ, a new case-finding instrument, to detect CMD.

It is necessary to highlight that adolescence is a complex process and that many CMD symptoms are part of the normal process. Therefore, health professionals must be cautious when deciding what is normal and what is pathological. A second point, thus, arises that is beyond this differentiation: recognition that the adolescent is ill and, therefore, needs help. In accordance with Pavuluri et al., lack of practical thinking and the hope that the illness will disappear by itself lead families not to seek help.¹⁸ Many families pay little attention to symptoms believing that they will disappear or that these problems are common and, as a consequence, they do not seek help in the early stages of the disease.

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