Behavioral and sociodemographic variables are associated with the psychological domain of adolescents' quality of life

Variáveis comportamentais e sociodemográficas estão associadas ao domínio psicológico da qualidade de vida de adolescentes

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ABSTRACT

Objective: To identify variables associated with the psychological domain of adolescents' quality of life.

Methods: 608 adolescents (14 to 20 years old) from Lapa, Paraná, Brazil, were included in the study. Body mass and stature were measured in order to assess the body mass index. For the assessment of quality of life, physical activity, alcohol consumption and socioeconomic status, the questionnaire of the World Health Organization-Bref (WHOQOL-Bref), the International Physical Activity Questionnaire (IPAQ), the Alcohol Use Disorders Identification Test (AUDIT) and the Brazilian Classification Economic Criteria were used, respectively. The chi-square and Fisher's exact test, along with logistic regression, were applied for statistical analysis.

Results: Logistic regression analyses showed that less active (OR=1.90; 95%CI=1.16-3.10), possible alcohol-dependents (OR=4.18; 95%CI=1.04-16.84), overweight (OR=1.79; 95%CI=1.06-3.04), females (OR=2.98; 95%CI=2.08-4.29) and freshman year high school students (OR=2.23; 95%CI=1.39-3.57) were more likely to have a negative perceptions on the psychological domain of quality of life.

Conclusions: Interventions that benefit physical activity, orientations on nutrition and alcohol consumption will contribute to improve the psychological domain of adolescents' quality of life.

Key-words: quality of life; motor activity; overweight; adolescents.

RESUMO

Objetivo: Identificar variáveis associadas ao domínio psicológico da qualidade de vida de adolescentes.

Métodos: Participaram do estudo 608 adolescentes (14 a 20 anos), do município da Lapa, Paraná. Foram mensuradas a massa corpórea e a estatura para obtenção do índice de massa corpórea. Para avaliar qualidade de vida, atividade física, consumo de álcool e condição socioeconômica, foram utilizados, respectivamente, o Questionário Abreviado para Avaliação da Qualidade de Vida da Organização Mundial da Saúde (WHOQOL-Bref), o Questionário Internacional de Atividades Físicas (IPAQ), o Teste para a Identificação de Problemas Decorrentes do Uso de Álcool (AUDIT) e o Critério de Classificação Econômica do Brasil (CCEB). Na análise estatística, foram utilizados os testes do qui-quadrado, exato de Fisher e a regressão logística univariada e múltipla.

Resultados: Os principais subgrupos associados ao risco de possuir percepção negativa do domínio psicológico da qualidade de vida, após a análise de regressão logística, foram compostos por adolescentes menos ativos (RC=1,90; IC95%=1,16-3,10), prováveis dependentes de bebidas alcoólicas (RC=4,18; IC95%=1,04-16,84), com excesso de peso (RC=1,79; IC95%=1,06-3,04), moças (RC=2,98;

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IC95%=2,08-4,29) e estudantes do primeiro ano do Ensino Médio (RC=2,23; IC95%=1,39-3,57).

Conclusões: As intervenções voltadas para a atividade física, bem como as orientações sobre a nutrição e o consumo de álcool, poderão contribuir para a melhoria do domínio psicológico da qualidade de vida de adolescentes.

Palavras-chave: qualidade de vida; atividade motora; sobrepeso; adolescente.

Introduction

Due to the growing concern about people's health and well-being, there has been a significant increase in the interest in and use of the term Quality of Life (QoL) both within the academic and health professional context, as well as in the daily life, in television commercials, billboards, and chats among friends. Within this context, several instruments have been developed with the purpose of measuring the QoL of different populations in a reliable and valid manner. Among these instruments, the WHOQOL-Bref developed by the study group on QoL of the World Health Organization[1] is widely accepted and has been tested and validated in several countries, including Brazil[2]. Using the WHOQOL-Bref it is possible to infer about the global QoL and the physical health, psychological, social relationships, and environment domains, which makes it possible to identify the main needs of the population studied in a detailed manner, aiming at the elaboration of public policies to promote health.

Currently, special attention has been given to the QoL of adolescents, since this is an important period to engage in programs designed to improve life conditions. Taking into consideration the evidence that psychological disorders among adolescents are related to suicide and problems in the family, social, and school environment[3-5], it is important to highlight the need of studies that investigate the psychological conditions so that effective interventions can be implemented to improve the QoL of this population.

There is evidence that behavioral and sociodemographic factors can be related to psychological issues among adolescents. Some studies have demonstrated that sedentary[6], obese[7] adolescents, and those who consume alcoholic beverages[8] have high rates of anxiety and depression. Similarly, sociodemographic variables such as: sex[4], school grade[9], and place of residence[10] determine psychological problems during adolescence. However, there is shortage of information on the variables associated with psychological aspects directly related to the QoL of adolescents.

Based on this overview, the objective of the present study was to identify behavioral and sociodemographic variables associated with the psychological aspects of the QoL of adolescents, as well as with groups at risk of having a negative perception of the psychological domain of the QoL.

Methods

The present study was conducted based on the database of the research project "Analysis of the quality of life, prevalence of alcohol consumption, level of physical activity, and body mass index in high school students from Lapa, state of Paraná, Brazil". The study protocol was approved by the Research Ethics Committee of Universidade Estadual de Ponta Grossa, state of Paraná, Brazil.

The project involved students from 14 to 20 years old, both males and females, regularly enrolled in public and private high schools located in the municipality of Lapa, in the metropolitan area of Curitiba, capital of the state of Paraná, in the South region of Brazil. The municipality had an estimated population of 44,733 inhabitants in 2005[11]. There were 1,596 students enrolled in high school at seven different schools: two private schools (n=75); three public schools in the rural area (n=338); and two public schools in the urban area (n=1,183), according to the information provided by the City Center of Education. The objective of the study was to assess adolescents enrolled in high school. However, the final sample included 608 individuals between 14 and 20 years old, whose data were collected and who participated in the study as volunteers, accounting for 38.1% of the population of high school students, which were divided into the following groups: private schools, 24 adolescents (accounting for 32% of the sample); public schools in the urban area, 391 adolescents (33.1% of the sample); public schools in the rural area, 193 adolescents (57.1% of the sample). The representativeness of the sample regarding the population studied was investigated using the sampling error according to the criteria established by Gil[12], which suggests a sampling error lower than 1% to guarantee the representativeness of the sample. In the present study, the sampling error was 0.7%. However, considering that this was a convenience sample and that the participants' characteristics are not known, there might be bias.

The QoL was measured using the WHOQOL-Bref, which includes 26 questions. The participants should consider the

last 15 days while completing the instrument. Izutsu *et al*[13] demonstrated that the WHOQOL-Bref has a valid content and acceptable psychometric properties to measure the QoL of adolescents.

The WHOQOL-Bref was analyzed based on the criteria suggested by the Australian team of the WHOQOL[14], which allow the classification of the QoL in scores ranging from 1 to 100. The closer to 100, the better the QoL of the subject assessed. For the present study, we only used data related to the psychological domain, which were dichotomized into positive and negative perception based on the median. The questions regarding this domain are as follows: How much do you enjoy life? To what extent do you feel your life to be meaningful? How well are you able to concentrate? Are you able to accept your bodily appearance? How satisfied are you with yourself? How often do you have negative feelings such as blued mood, despair, anxiety, depression?

The physical activity level (PAL) was measured using the International Physical Activity Questionnaire (IPAQ), version 8, short last seven days format, validated for Brazilian adolescents[15]. In order to classify the PAL, we categorized the sample according to quartiles.

Alcohol consumption was assessed using the Alcohol Use Disorders Identification Test (AUDIT), an instrument developed by the WHO and validated by Lima *et al*[16] to be used in epidemiological studies involving the Brazilian population. Alcohol consumption was assessed based on the recommendations by Babor *et al*[17] that suggest the following classifications: abstainer, low risk consumer, risk consumer, high risk consumer, and probably dependent on alcohol. For the logistic regression analysis, the categories were grouped into: abstainer/low risk consumer, risk consumer/high risk consumer, and probably dependent on alcohol.

Data on body mass (BM, kg) were collected using a digital scale Plenna with capacity for 150kg and resolution of 100g. Height (H, cm) was measured using a measuring tape with a graduation of 0.1cm, which was mounted on an even support surface. Both measurements were carried out according to standardized procedures and techniques[18]. BM and H were used to calculate the body mass index, BMI ($kg.m^{-2}$). For the classification of BMI among adolescents from 14 to 19 years old, we used the criterion suggested by Conde and Monteiro[19] and, for adolescents aged 20 years, we used the cutoff points established by the World Health Organization (WHO)[20]. In the logistic regression analysis, the individuals were grouped into two groups: normal and excessive weight (overweigh/obesity).

Socioeconomic condition was assessed according to the Brazilian Economic Classification Criteria developed by the Brazilian Association of Survey Companies (*Associação Brasileira de Empresas de Pesquisa*)[21]. In the present study, the socioeconomic classes were divided into high class (A1+A2), middle class (B1+B2), and low class (C+D+E).

The collection of data related to the questionnaires was conducted in the classrooms. The questionnaires were administered under the supervision of the interviewer, who read the questions with the purpose of helping the students to understand the objective of each question.

First, we performed a descriptive analysis of the psychological domain of the QoL of the adolescents investigated. Next, we used the chi-square test and, whenever necessary, Fisher's exact test to investigate the proportional differences related to the psychological domains between the following variables: sex, age, socioeconomic condition, type of school, place of residence, school grade, and class time. Binary logistic regression (crude and adjusted analyses) was used to assess the associations between level of physical activity, alcohol consumption, nutritional status, and sociodemographic variables (independent variables) and the psychological domain (dependent variable) of adolescents. We performed a univariate crude analysis between each independent and dependent variable. To model the adjusted regression analysis, the variables associated with the psychological domain, with a significance level lower than 0.20 on the chi-square test, were included in the regression model, one at a time, in ascending order, according to their statistical significance. The significance level was set at $p<0.05$.

Results

Based on the analysis of the WHOQOL-Bref, we found a mean value of global QoL of the adolescents (mean of all domains) of 67.3, with standard deviation of 10.2. Regarding the psychological domain, we found a mean value of 66.6, with standard deviation of 14.1. The analyses related to the proportions for the psychological domain of the QoL, stratified according to the sociodemographic variables, are shown in Table 1. Our findings demonstrate that sex, type of school, place of residence, and school grade were associated with the psychological domain.

Crude logistic regression analysis demonstrated the association of the psychological domain with physical activity, alcohol consumption, nutritional status, type of school, place of residence, sex, and school grade. The adjusted analysis

Table 1 – Perception of the psychological domain of the adolescents' QoL according to sociodemographic variables

Sociodemographic variables	Perception of the psychological domain (%)		*p*-value
	Positive	Negative	
Sex			
Male	64.0	36.0	0.001
Female	36.9	63.1	
Age (years)			
14	41.1	58.9	0.215
15	42.6	57.4	
16	53.5	46.5	
17	48.5	51.5	
18	56.8	43.2	
19	36.4	63.6	
20	33.3	66.7	
Socioeconomic status			
A	48.4	51.6	0.901
B	46.0	54.0	
C, D and E	48.1	51.9	
Type of school			
Public	48.5	51.5	0.024
Private	25.0	75.0	
Place of residence			
Rural area	54.4	45.6	0.021
Urban area	44.3	55.7	
Grade			
1st year	39.5	60.5	0.003
2nd year	53.0	47.0	
3rd year	54.1	45.9	
Class time			
Morning	44.0	56.0	0.192
Afternoon	49.8	50.2	
Evening	53.4	46.6	

excluded only the following variables: type of school and place of residence. Odds Ratio (OR) for a negative perception of the psychological domain was higher in the following groups: probably dependents on alcoholic beverages and risk/high risk consumers (OR=4.18; 95%CI=1.04-16.84 and OR=4.73; 95%CI=1.21-18.51, respectively), females (OR=2.98; 95%CI=2.08-4.29), freshman high school students (OR=2.23; 95%CI=1.39-3.57), less active individuals (OR=1.90; 95%CI=1.16-3.10), and overweight individuals (OR=1.79; 95%CI=1.06-3.04) (Table 2).

Discussion

Our findings suggest that the psychological domain is a vulnerable aspect of the QoL of these youths, with a mean score of 66.6. These results are a reason for concern and evidence the need of measures taken by health professionals with the purpose of improving the psychological aspects of these youths' lives, mainly in terms of positive and negative feelings, thought, learning, memory and concentration, self-esteem, body image and appearance, spirituality, religion and personal beliefs[1]. The present study contributes to broaden the knowledge regarding the psychological domain of the QoL of the Brazilian adolescents, and it also shows relevant results related to the behavioral and sociodemographic variables determined by this domain. The shortage of studies about the psychological aspects directly related to the QoL of adolescents, especially those using the WHOQOL-Bref, makes it difficult to compare our findings with other data.

Based on the logistic regression analysis, the variables physical activity, alcohol consumption, nutritional status, sex, and school grade were associated with the psychological domain for the sample investigated. With regard to the relationship between the psychological domain and physical

Table 2 – Association between the psychological domain of the QoL and physical activity, alcohol consumption, nutritional status, and sociodemographic variables of adolescents

Variables (Categories)	Negative perception of PD (%)	Crude analysis OR (95%CI)	Adjusted analysis*** OR (95%CI)
Physical activity			
4th quartile	43.4	1*	1**
3rd quartile	50.7	1.46 (0.92-2.31)	1.55 (0.96-2.52)
2nd quartile	53.3	1.62 (1.03-2.56)	1.72 (1.06-2.80)
1st quartile	62.5	2.17 (1.37-3.44)	1.90 (1.16-3.10)
Alcohol consumption			
Abstainers/Low Risk	52.7	1*	1**
Risk/High Risk	48.5	3.59 (1.00-12.88)	4.73 (1.21-18.51)
Probably Dependent	80.0	4.25 (1.15-15.73)	4.18 (1.04-16.84)
Nutritional status			
Normal Weight	50.7	1*	1**
Overweight	64.6	1.77 (1.09-2.90)	1.79 (1.06-3.04)
Type of school			
Public	51.5	1*	1
Private	75.0	2.82 (1.10-7.21)	2.24 (0.83-6.00)
Place of residence			
Rural Area	45.6	1*	1
Urban Area	55.7	1.50 (1.06-2.11)	1.26 (0.86-1.86)
Sex			
Male	36.0	1*	1**
Female	63.1	3.05 (2.17-4.28)	2.98 (2.08-4.29)
Grade			
1st year	60.5	1.81 (1.19-2.77)	2.23 (1.39-3.57)
2nd year	47.0	1.73 (1.20-2.49)	1.71 (1.16-2.53)
3rd year	45.9	1*	1**

*p<0.05 for the crude analysis; **p<0.05 for the adjusted analysis; ***Adjusted analysis for the other independent variables of the regression model. # PD: psychological domain.

activity, we found that less active individuals have a higher chance of having a negative perception of the psychological domain in comparison with more active individuals. These findings are in agreement with other studies that have demonstrated a close relationship between high rates of physical activity and psychological well-being among adolescents[6,22]. Tomé and Valentini[6] compared psychological parameters between physically active and sedentary adolescents and adults. Their findings evidenced that, both during adolescence and in adulthood, rates of anxiety and aggressiveness were significantly lower in those individuals who practiced physical activities regularly (frequency of three times a week and duration of one hour per session). In a recent review of the literature about the role played by physical capacity in the health markers of children and adolescents, Ortega *et al*[22] evidenced that improvement in the physical capacity (a variable directly related to the level of physical activity), mainly regarding aerobic capacity, have positive effects on depression, anxiety, and self-esteem, and it seem to be associated with better academic performance. Therefore, the practice of physical activity seems to be a relevant variable for the improvement of the perception of the psychological domain among adolescents.

For the association between psychological aspects and alcohol consumption, we found that risk consumers and probably dependents on alcoholic beverages had a higher chance of having a negative perception of the psychological domain, which is consistent with the findings of the literature. The study by Manso and Matos[23] analyzed the relation between alcohol consumption and anxious and depressive feelings among adolescents, and the findings suggested that alcohol consumers had higher rates of anxiety and depression than abstainers. Similarly, Ilhan, Demirbas and Dogan[24] investigated the association between alcohol consumption

and psychosocial factors in adolescents from Ankara, Turkey, and they reported that alcohol consumption was associated with anxiety and feelings of inability in Turkish adolescents. In a recent study, Zinn-Souza *et al*[8] investigated the factors associated with depressive symptoms in high school students from the municipality of São Paulo and found that alcohol consumption increased the risk of depressive disorders. Therefore, the excessive intake of alcohol seems to be a risk factor for unfavorable psychological conditions among adolescents.

With regard to the association between the psychological domain and nutritional status, our results demonstrated that overweight adolescents had a higher chance of having a negative perception of the psychological domain. These findings were in agreement with the review of the literature conducted by Luiz *et al*[7] about the association between obesity and psychological aspects, since they demonstrated a close relation between obesity during childhood and adolescence and psychological aspects such as depression, anxiety, and social competence deficits. This context is even more disturbing when one takes into consideration that psychological problems, mainly depression, can increase the risk of developing and maintaining obesity during adolescence[25]. On the other hand, with the purpose of comparing psychological aspects in obese and eutrophic adolescents, Cataneo, Carvalho and Galindo[26] analyzed locus of control, self-concept, anxiety, cognitive and emotional maturation, and behavioral problems in 54 adolescents aged between ten and 12 years who lived in Ribeirão Preto, state of São Paulo, Brazil. The authors found that the groups did not show any differences in terms of the variables studied, with evidence of psychological suffering in both groups, thus denying the association between obesity and psychological or behavioral problems. There are methodological differences between the present study and the study conducted by Cataneo, Carvalho and Galindo[26], such as the study design and instrument used to assess the psychological factors, which makes it difficult to compare the findings. On the other hand, such differences suggest that further studies should be conducted with the purpose of identifying the actual interference of overweight/obesity in the psychological aspects of the QoL of adolescents.

In terms of the association between the psychological domain and sex, we found that female individuals were a risk group for negative perception of the psychological domain. These findings are in agreement with the study carried out by Jatobá and Bastos[4], involving 243 male and female adolescents (14-16 years old) from Recife, state of Pernambuco, Brazil. The authors found a significant association of severe depressive symptoms among females. The findings of the study by Manso and Matos[23] demonstrated that, among 344 adolescents, females had higher rates of depression and anxiety than their male peers. Based on the findings of the present study and the above mentioned studies, female adolescents seem to be a vulnerable group with regard to psychological aspects, mainly in terms of depression and anxiety, possibly due to hormonal and cultural differences between sexes.

School grade was also a variable associated with the psychological domain of the sample investigated, since freshmen high school students had a higher chance of having a negative perception of the psychological domain than senior high school students. The shortage of studies investigating the interference of school grade in psychological parameters among adolescents makes it difficult to make comparisons and draw conclusions. However, based on the studies by Way *et al*[9] and Reddy, Rhodes and Mulhall[27], it is possible to assume that the unfavorable psychological status found among freshmen high school students may be the result of the change in the school cycle (from elementary school to high school), when students usually change schools, have to adapt to a new social group, change school phase and have new teachers.

According to our findings regarding the psychological aspects of the QoL of the adolescents investigated and considering the recommendations of the WHO[28], some measures aimed at improving the life conditions of this population can be designed within the school environment since this is an adequate environment for interventions. Next, we present some possibilities of initiatives based on the change of habits that may be included in health promotion programs conducted at schools with the purpose of helping to improve the QoL of adolescents, mainly regarding the psychological aspects. Increase in the level of physical activity, reduction of alcohol consumption, and decrease in BMI seem to be key factors for improving the psychological aspects of the youths investigated. Offering lectures at schools about the adverse effects and health risks of alcohol consumption and obesity may be a way to improve the QoL of these adolescents. According to this point of view, it is possible to approach some extremely important topics such as healthy diet and safe practice of physical activity. Similarly, it is necessary to stimulate the practice of all types of activities to increase the level of physical activity of adolescents. Physical Education teachers are mainly responsible for this task. Nevertheless, intervention programs aimed at these changes should be

different in terms of sex and school grade, since females and freshmen high school students need to receive special attention and treatment, including psychological follow-up, whenever possible.

Considering that the present study was a cross-sectional study, these findings need to be cautiously analyzed, since it is not possible to establish a cause-effect relation between the behavioral and sociodemographic variables investigated and the psychological domain of the QoL of adolescents. Longitudinal studies are necessary to identify the direction of these relations and to confirm the results of the present study, since the psychological domain may be impaired by changes caused by inappropriate lifestyle. On the other hand, the psychological domain may be one the factors responsible for the decrease in the level of physical activity and the increase in alcohol consumption and BMI among adolescents.

In short, the findings of the present study allow us to conclude that the main subgroups of adolescents at risk of having a negative perception of the psychological domain of the QoL are those less active, probably dependent on alcohol, overweight, females and freshmen high school students. Therefore, interventions that mainly provide physical activity promotion and guidance regarding nutrition and alcohol consumption will contribute to improve the psychological domain of the QoL of adolescents. These findings may serve as the basis to stimulate government and society to join efforts with the purpose of establishing a policy that creates an effective movement of health promoting schools as a manner to improve the quality of life of the population.

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