The association between common mental disorders and quality of life in adolescents with asthma

Associação entre transtornos mentais comuns e qualidade de vida em adolescentes asmáticos

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Resumo

Introdução: A asma é a doença crônica mais prevalente no adolescente, traz limitações à sua qualidade de vida e preocupações quanto a sua saúde. Possuir uma doença crônica nessa faixa etária além dos limites causados pela própria doença aumenta a vulnerabilidade a danos emocionais como transtornos mentais comuns (TMC). **Objetivo**: Avaliar a associação entre TMC e qualidade de vida em adolescentes asmáticos. **Método**: Estudo seccional de base ambulatorial, entre 210 adolescentes asmáticos de 12 a 21 anos atendidos em um ambulatório especializado de um serviço universitário voltado à atenção ao adolescente, no Rio de Janeiro. A qualidade de vida (QV) foi avaliada através do *Paediatric Asthma Quality of Life Questionnaire* – PAQLQ e presença de TMC, pelo *General Health Questionnaire* (GHQ-12). A qualidade de vida total e suas diferentes dimensões foram tratadas como variáveis dicotômicas e utilizou-se o modelo log-binomial para o cálculo das razões de prevalência brutas e ajustadas. **Resultados**: A prevalência total de asmáticos com TMC foi de 32,4%. A prevalência de QV ruim entre adolescentes com TMC foi de 36,6%. O modelo final ajustado mostrou uma associação entre TMC e QV total ruim (RP= 1,84 IC 95% 1,19-2,86), assim como para os domínios referentes à emoção (RP=1,77 IC 95% 1,16-2,62)e sintomas (RP=1,75 IC 95% 1,14-2,70). Para o domínio atividade física a associação com TMC foi apenas *borderline* (RP=1,43 IC 95% 0,97-2,72). **Conclusão**: Os resultados do estudo sugerem a necessidades de maior atenção aos aspectos emocionais dos adolescentes portadores de doenças crônicas, de forma a subsidiar ações mais efetivas na área de saúde mental visando a melhor qualidade de vida e o tratamento global do paciente asmático.

Palavras-chave: Qualidade de vida, asma, adolescentes, transtornos mentais comuns

Abstract

Introduction: Asthma is the most prevalent chronic disease among adolescents, not only affecting their quality of life but also causing great concern about their health. Having a chronic disease in this age group beyond the limits of the disease itself increases vulnerability to emotional damage, including common mental disorders (CMD). **Objective**: To evaluate the association between CMD and quality of life in adolescents with asthma. **Methods**: This cross-sectional study investigated 210 asthmatic adolescents aged between 12 to 21 years, treated in an adolescent outpatient service in the city of Rio de Janeiro, Brazil. The Pediatrics Asthma Quality of Life Questionnaire (PAQLQ) and General Health Questionnaire (GHQ-12) were used to assess quality of life (QoL) and common mental disorders (CMD), respectively. Total quality of life and its various dimensions were treated as dichotomous variables. A log-binomial model was used to calculate crude and adjusted prevalence ratios. **Results**: The prevalence of asthmatics with CMD was 32.4%, while the prevalence of poor QoL among adolescents with CMD was 36.6%. The adjusted final models showed an association between CMD and poor total quality of life (PR= 1.84 95% CI 1.19-2.86), as well as for areas related to emotions (PR =1.77 95% CI 1.16-2.62) and symptoms (PR=1.75 95% CI 1.14-2.70). For the physical activity domain, the association with CMD was only borderline. (PR=1.43 95% CI 0.97-2.72). **Conclusion**: The results of this study suggest that greater attention should be paid to the emotional needs of adolescents with chronic diseases, including more effective actions in the field of mental health in order to improve quality of life and overall treatment of young asthmatic patients.

Keywords: Quality of Life, asthma, adolescents, common mental disorders.

Introduction

To define adolescence is a difficult task. The concepts found in the literature and in common sense are usually not sufficient to describe these individuals who are neither children nor adults. For adolescents themselves, this category has no meaning either: they see it as something external, spoken of by others[1]. For health professionals, this is an opportune moment for preventive actions, aimed at adolescent health care, to be developed, promoting a healthy life and boosting self-esteem.

A disease with a prolonged course prevents an individual from innumerable sources of personal pleasure, in the sense that it interferes with self-esteem, control of one's own body, and interpersonal relationships.[2] These limitations, in a stage of life as delicate as adolescence, become even greater. Sawyer *et al.*[3], in a cohort study, observed a loss of quality of life in adolescents with chronic diseases such as asthma, cystic fibrosis and diabetes.

Asthma is the main chronic disease during adolescence and it is in this stage when maturation and growth, including that of the respiratory system, greatly speed up[4]. A reduction in the respiratory function in such stage may lead to irreversible changes in pulmonary structure and also a decrease in the final height. In addition to problems inherent in adolescence, the association with a chronic disease such as asthma can cause feelings of failure, hopelessness, anger, self-criticism, loss of self-esteem and fear, becoming an extra burden on adolescents.

In children and adolescents, there are repercussions not only for the patient, but also the entire familial and educational universe, which may create complex problems and have implications in the long term, translating into a reduction in quality of life of the whole group[5].

Quality of life in patients with chronic diseases, particularly asthma, has been a recurrent theme in the literature. The World Health Organization-Quality of Life Group

(WHOQOL) defined quality of life as "an individual's perception of their position in life, in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". This is a far-reaching concept, influenced in a complex way by an individual's physical health, psychological status, level of independence, social relations and environmental characteristics[6].

Thus, to define quality of life has been a highly controversial task among researchers in health areas. Bowling[7] points out that quality of life is a broad concept, which has been used by innumerable disciplines and fields of activity, such as geography, literature, philosophy, health economics, marketing and advertising, health promotion and social and medical sciences (sociology and psychology).

Recent studies in the literature try to correlate severe asthma with a higher risk of damage to adolescents' mental health[8]. In Brazil, in a study with 4,030 workers from a university of the state of Rio de Janeiro, Nogueira[9] observed that individuals with a history of medical diagnosis of asthma were more likely to have common mental disorders (PR = 1.37; 95% CI 1.22-1.55) than those without this diagnosis.

In children and adolescents, the incidence of emotional disorders has been considered high. In the United States, approximately 7% of the child population suffers from asthma and a review of epidemiological studies concluded that 12% of these children show a certain type of emotional disorder[10]. Studies on adolescents performed in Brazil showed a strong positive association between common mental disorders and chronic disease[1,11]. Neves *et al.*[10] showed that approximately 30% of children with a diagnosis of severe asthma and hospitalized in a tertiary hospital, had depression as an important marker of fatal asthmatic crises.

Adequate control of asthma is associated with the patient's ability to detect changes in the intensity of the obstruction and quickly follow therapeutic guidance, according to the individualized action plan[12]. Mood disorders may interfere with the identification of bronchial obstruction in asthmatics[13]. Thus, the presence of mental disorders in asthmatic patients should be carefully evaluated, because it could mean an even greater impact on these patients' quality of life.

Considering the epidemiological and social relevance of the theme and the scarce national production on it, the analysis of the association between common mental disorders (CMD) and quality of life and their different domains in a population of adolescents becomes relevant in the Brazilian urban context.

Materials and Methods

Study design and reference population

A cross-sectional, outpatient-based study was performed. The study population was comprised of 240 asthmatic adolescents, 35% of the 688 patients cared for in the *Ambulatório de Alergia-Imunologia do Núcleo de Estudos da Saúde do Adolescente* (NESA – Rio de Janeiro State University, Center for Adolescent Health Studies, Allergy-Immunology Outpatient Clinic). Data were collected between March and November 2006. Criteria for eligibility were as follows: to have asthma, diagnosed according to the *III Consenso Brasileiro de Asma* (3rd Brazilian Congress of Asthma); to be aged between 12 and 21 years (not yet completed); and to live in the city of Rio de Janeiro or its metropolitan area. Individuals with a neurological or cognitive disease that prevented them from completing the questionnaire were excluded. Only one family refused to participate in the survey and 29 questionnaires were not fully completed or did not include the criteria to be categorized as asthma.

Data collection and instruments

Data were collected between March and November 2006. Adolescents were recruited through the Allergy-Immunology Outpatient Clinic (*Programa de Qualidade*

de Vida nas Doenças Respiratórias – Program of Quality of Life in Respiratory Diseases) once a week.

The questionnaire used was designed from the joining of three aspects of investigations. Initially, socio-demographic and economic data were collected, including age, sex, parents' level of education, adolescent's level of education, ethnic group, per capita household income, smoking habit, physical activity, adolescent's occupation, use of medication and presence of other allergic diseases. The Pediatric Asthma Quality of Life Questionnaire – PAQLQ[14], which includes the following 23 items and three domains, was used to assess quality of life: symptoms (10 questions), physical activity (5 questions) and emotional aspects (8 questions). This questionnaire can quantify changes of quality of life in an individual throughout time. La Scala[15] validated it to Brazilian Portuguese. This instrument was designed to be applied to children aged between seven and 17 years, through face-to-face interviews or self-completion questionnaires. It lasts ten minutes on average. Questions are always related to the previous week and, according to the question, are divided into a blue card, to assess the severity of discomfort, and a green card, to quantify the frequency of symptoms. The response options for each item were classified according to a scale of seven points, where one indicates maximum harm and seven, no harm. Results are shown as means of scores per item and for each domain, in addition to a total score[14].

Finally, the assessment of common mental disorders (CMD) was performed through the short version of the General Health Questionnaire (GHQ-12), an instrument which is well established and widely used in both national and international studies[16, 17]. This self-completion questionnaire was assessed in its original[18] and Brazilian versions[16], using the Clinical Interview Schedule[19] as the gold standard in both cases. The cut-off point used for the questionnaire considers each item as present or absent (0 or 1), according to the GHQ method. Cases that were positive for three items of the GHQ-12[20] were considered as CMD cases. The GHQ reference period were the two weeks prior to questionnaire completion.

Study variables

Quality of life was treated as a dichotomous outcome (good-poor) and is based on the mean of response scores, the one most frequently used in the literature[21]. As regards the three domains (physical activity, emotions and symptoms), the same criteria were used. Responses varied from 1 (poorest quality of life) to 7 (best quality of life). The explanatory variable was the presence of common mental disorders (CMD), treated as a dichotomous variable, and the cut-off point was three or more positives for the CMD "case" codification. The following socio-demographic and economic variables were assessed as covariables: sex, ethnic group (black, white, and mixed), age (less than 15 years and 15 years or more), adolescent's level of education (incomplete primary education, complete primary education, incomplete secondary education, complete secondary education, and higher education), per capita household income (up to one minimum wage, between one and two minimum wages, between two and four minimum wages, and more than five minimum wages), time of diagnosis of disease (less than five years, between five and ten years, more than ten years), whether the adolescent worked, parents' marital status (married, not married), whether adolescents lived with their parents or not, severity of asthma and use of medication.

Data analysis

Data were input with the Epi Info 2000 software. All statistical analyses were performed with the R statistical software, version 2.3.4[22]. In the first stage, the distributions of frequency and graphs of each variable in the study were produced and analyzed. In the bivariate analysis, chi-square test (independence) was employed to observe whether the associations found showed significant

differences ($p < 0.10$), using this criterion to select possible confounding factors.

In the multivariate analysis, although the traditional logistic regression model is frequently used in prevalence studies, this new study chose the log-binomial regression model[23,24], once this model is capable of directly estimating the adjusted prevalence ratio (PR). The log-binomial model was adjusted to include the covariables that were statistically associated in the bivariate analyses, with the variables associated with the outcome remaining in the model and sex and age being forced into it.

Ethical aspects

Prior to data collection, the protocols for this study were approved by the *Comitê de Ética do Hospital Universitário Pedro Ernesto* (Pedro Ernesto University Hospital Ethics Committee), to which NESA is subject. A written informed consent form was shown to and signed by the adults responsible for adolescents aged less than 18 years and by those aged more than 18 years who were interviewed. Through this document, patients and their responsible adults were informed about the relevance of the study and the importance of their participation. Permanence in the outpatient clinic was guaranteed, when families stopped participating in the study and after the end of such study.

Results

In the population studied, 64.29% of adolescents were older than 15 years of age and 61% were females. There was a predominance of patients with incomplete secondary education, 31.4%. The majority of adolescents did not work. A total of 32.4% had CMDs and 55.3% showed good total quality of health, as did the different domains of physical activity, emotions and symptoms. In all domains, a similar portion of adolescents were classified as showing poor quality of life (Table 1).

With regard to the association among socio-demographic characteristics in the different quality of life domains (Table 2), there was little variation among responses for the domains of symptoms, physical activity and emotions.

Table 3 shows that the prevalence of poor total quality of life (QoL) in patients with common mental disorders (CMD) was 61.8%, the same occurring with the domains of symptoms and emotions, with a small difference in the physical activity domain (55.9%), which showed poor quality of life.

After adjustment for sex and age (Table 4), a prevalence ratio of 1.94 was found (95% CI 1.28- 2.92) in the total score of quality of life in this population. As regards the domains, the crude prevalence ratio of physical activity was 1.44 (95% CI 0.97-2.14); while that of emotions was 1.83 (95% CI 1.22 -2.72), similar to the domain of symptoms.

Discussion

This study found a strong association between the presence of common mental disorders and loss of quality of life (1.94 (95% CI 1.28- 2.92)) and this association repeats itself in the different domains. Although the Brazilian literature includes few studies on quality of life and asthmatic adolescents, there is a world trend towards greater use of instruments that assess different implications of asthma[25,26]. A state of depression associated with a chronic disease such as asthma may interfere with one's adherence to treatment and result in loss of quality of life to control asthma[27].

Findings from this study are in accordance with previous studies performed in other countries. Lavoie[28] conducted a study using the Asthma Quality of Life Questionnaire (AQLQ) and observed an association between depression and poorer quality of life. Goldbeck et al.[8] showed that the presence of an emotional disorder affects the severity of symptoms and quality of life of asthmatic adolescents more greatly.

The predominance of adolescents aged more than 15 years in this sample can be explained by the fact that the majority of pediatric services in the public health ne-

Table 1 – Sociodemographic and economic characteristics, time of diagnosis, presence of common mental disorders (CMD) and quality of life (QoL) according to domains among asthmatic adolescents seen at an outpatient clinic of a university hospital (n = 210).

	N	%
Sex		
Female	128	(60,95)
Male	82	(39,05)
Ethnic group		
Black	40	(19,05)
White	98	(46,67)
Mixed	72	(34,29)
Age		
< 15 years	75	(35,71)
≥ 15 years	135	(64,29)
Level of education		
Incomplete primary education	57	(27,40)
Complete primary education	44	(21,15)
Incomplete secondary education	66	(31,73)
Complete secondary education	29	(13,94)
Higher education	12	(5,77)
Household income		
Up to 1 MW*	13	(6,19)
>1 to 2 MW	72	(34,29)
> 2 to 5 MW	94	(44,76)
>5 MW	31	(14,76)
Work		
Yes	36	(17,14)
No	174	(82,86)
Time of diagnosis		
Up to 5 years	61	(29,05)
5 to 10 years	33	(15,71)
More than 10 years	116	(55,24)
CMD		
Yes	68	(32,38)
No	142	(67,62)
Total QoL		
Good	116	(55,24)
Poor	94	(44,76)
QoL – domain of emotions		
Good	118	(56,19)
Poor	92	(43,81)
QoL – domain of physical activity		
Good	112	(53,33)
Poor	98	(46,67)
QoL – domain of symptoms		
Good	118	(56,19)
Poor	92	(43,81)

Table 2 – Prevalence of sociodemographic factors and quality of life (QoL) according to domains among asthmatic adolescents seen at an outpatient clinic of a university hospital (n = 210).

	QV Sintomas			QV Atividade Física			QV Emoções		
	Boa	Ruim	p Valor	Boa	Ruim	p Valor	Boa	Ruim	p Valor
	n (%)	n (%)		n(%)	n(%)		n(%)	n(%)	
Sex									
Female	74 (57,81)	54 (42,09)	0,554	68 (53,12)	60 (46,88)	0,554	73 (57,03)	55 (42,97)	0,940
Male	38 (42,68)	44 (57,32)		38 (46,34)	44 (53,65)		37 (45,12)	45(54,88)	
Ethnic group									
Black	23 (52,50)	17 (47,50)	0,844	17 (42,50)	23 (57,50)	0,844	19 (47,50)	21 (52,50)	0,780
White	53 (57,14)	45 (42,86)		52 (53,06)	46 (46,94)		59 (60,20)	39 (39,80)	
Mixed	42 (56,94)	30 (43,06)		43 (59,72)	29 (40,28)		40 (55,56)	32 (44,44)	
Age									
< 15 years	35 (46,60)	40 (54,40)	0,314	41 (54,67)	34 (45,33)	0,772	37 (49,33)	38 (50,67)	0,700
≥ 15 years	83 (61,48)	52 (38,52)		71 (52,59)	64 (47,41)		81 (60,00)	54 (40,00)	
Level of education									
Incomplete primary education	22 (40,35)	35 (59,65)	0,065	30 (52,63)	27 (47,37)	0,008	32 (56,14)	25 (43,86)	0,100
Complete primary education	24 (52,27)	20 (47,73)		22 (50,00)	22 (50,00)		24 (54,55)	20 (45,45)	
Incomplete secondary education	47 (72,73)	19 (27,27)		41 (62,12)	25 (37,88)		39 (59,09)	27 (40,91)	
Complete secondary education	12 (41,38)	17 (58,62)		10 (34,48)	19 (65,52)		15 (51,72)	14 (48,28)	
Higher education	12 (100,00)	9 (75,00)		3 (25,00)	8 (66,67)		4 (33,33)		
Household income									
1 MW*	7 (53,85)	6 (46,15)	0,303	7 (53,85)	6 (46,15)	0,745	7 (53,85)	6 (46,15)	0,667
>1MW to 2 MW	45 (62,50)	27 (37,50)		43 (56,94)	29 (43,06)		44 (61,11)	28 (38,89)	
> 2 MW to 5 MW	46 (48,94)	48 (51,06)		47 (48,94)	47 (51,06)		49 (52,13)	45 (47,87)	
> 5 MW	20 (64,52)	11 (35,48)		15 (64,52)	16 (35,48)		18 (58,06)	13 (41,94)	
Parents' marital status									
Not married	45 (60,00)	30 (40,00)	0,440	43 (57,33)	32 (42,67)	0,420	45 (60,00)	30 (40,00)	0,440
Married	73 (54,48)	61 (45,52)		69 (51,49)	65 (48,51)		73 (54,48)	61 (45,52)	
Living with									
Parents	95 (57,58)	70 (42,42)	0,521	91 (55,15)	74 (44,85)	0,098	98 (59,39)	67 (40,61)	0,247
Other people	17 (51,52)	16 (48,48)		13 (39,39)	20 (60,61)		16 (48,48)	17 (51,52)	

* Minimum Wage

twork do not care for this population and that the NESA is a referral service. Sociodemographic data from this study show a predominance of diagnosis of asthma in females (61%), whereas this diagnosis totaled 39% in males. In the general population, there is a predominance of asthma in boys during childhood, although this relationship greatly changes in adolescence, once boys have more remission and more new cases occur in girls[29]. After the age of 30 years, the difference between sexes disappears[30,31].

In the literature, there are certain studies that assess the association between chronic disease and common mental disorders. Newacheck[32], in a study with Brazilian adults, observed that chronically ill patients show a 35% higher risk of developing behavioral disorders such as anxiety and depression.

In a study performed by Machado[33] with a Brazilian population, depression was found in 25% of asthmatic adults, a frequency that was two times higher than that

Table 3 – Prevalence of poor total quality of life (QoL) and domains according to common mental disorders (CMD) among asthmatic adolescents seen at an outpatient clinic of a university hospital (n = 210).

	Total QoL		QoL – Symptoms		QoL – Physical activity		QoL – Emotions	
	Good	Poor	Good	Poor	Good	Poor	Good	Poor
	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)
CMD								
Present	26 (38,24)	42 (61,76)	28 (41,18)	40 (58,82)	30 (44,12)	38 (55,88)	28 (41,18)	40 (58,82)
Absent	90 (63,38)	52 (36,62)	90 (63,38)	52 (36,62)	82 (57,75)	60 (42,25)	90 (63,38)	52 (36,62)

Table 4 – Raw and adjusted prevalence ratios according to sex and age, schooling and if the adolescent lived with parents, respective 95% confidence intervals (95% CI) of the association between common mental disorders (CMD) and domains of quality of life among asthmatic adolescents seen at an outpatient clinic of a university hospital (n = 210).

	Quality of life					
	Total			**Symptoms**		
	Crude PR	Adjusted PR*	Adjusted PR**	RP brutas	Adjusted PR*	Adjusted PR**
CMD						
Absent	1	1	1	1	1	1
Present*	1,99 (1,41 - 2,99)	1,94 (1,28 - 2,92)	1,84 (1,19 - 2,86)	1,83 (1,22 - 2,72)	1,77 (1,18 - 2,65)	1,75 (1,14 - 2,70)
	Physical activity			**Emotions**		
	Crude PR*	Adjusted PR*	Adjusted PR**	Crude PR*	Adjusted PR*	Adjusted PR**
CMD						
Absent	1	1	1	1	1	1
Present	1,44 (0,97 - 2,14)	1,45 (0,98 - 2,15)	1,48 (0,97 - 2,24)	1,83 (1,22 - 2,72)	1,79 (1,20 - 2,68)	1,77 (1,16 - 2,62)

**Model 1- All - Adjusted for sex and age*
***Model 2- Total QoL : sex, age, level of education, whether adolescent lives with parents*
QoL Symptoms: sex, age, level of education.
QoL Physical activity: sex, age, whether adolescent lives with parents.
QoL Emotions: sex, age, level of education.

observed in patients followed in a general outpatient clinic[34] and five times higher than that of the general population[35]. In a randomized study, Gillaspy et al.[36] assessed the history of self-reported asthma of 221 asthmatic adolescents and 192 adolescents without a history of asthma and observed that individuals with a diagnosis of self-reported asthma had a higher risk of suffering from common mental disorders than those without a diagnosis of asthma (p<0.01).

The General Health Questionnaire (GHQ-12) provides an approximation between common mental disorders and psychological suffering (proxy for emotional stress) and, through its use, asthmatic adolescents can be followed and assessed. Although the use of the GHQ is not recommended for children, this instrument has been used by other authors in adolescents, including in Brazil[1,11,37]. Data from the present study showed a result of 32.4% for the presence of CMD in asthmatic patients. This finding is consistent with the international literature, which estimates that a chronic disease increases psychological suffering during adolescence[38].

The sample of this study showed a relevant prevalence of poor QoL and asthma, both in the total score and in the three domains. Recent studies showed that asthmatic patients have poor quality of life[39,40]. Regardless of the severity of asthma, there is a reduction in QoL in the physical, psycho-

logical and social domains of the HRQOL, with the majority of asthmatics showing restrictions in their lives and a poorer health status than individuals without asthma[41,42]. In 2003, Ford et al.[39] performed a major population-based study and observed that asthmatics have a significantly poorer quality of life than those who had never had asthma. In Brazil, there is a lack of studies that associate quality of life, asthma and adolescents.

In addition, it should be emphasized that the present study was performed with a sample of asthmatic adolescents cared for in a referral outpatient clinic with unique characteristics. This population lives in a metropolitan area of the city of Rio de Janeiro, subject to social and economic urban adversities, thus limiting the possibility of findings being generalized to the general population. However, these findings are consistent with those of the international literature, emphasizing the relevance of longitudinal studies that assess the long-term effects of asthma.

The experience of working with quality of life in asthma revealed a wealth of information that usually passes unnoticed by the health team and which is highly relevant for patients. Patients were satisfied with the questions and often reported that nobody had ever made such questions before.

However, the cross-sectional nature of the study did not enable the temporal precedence between exposure and outcome to be safely established.

Thus, the possibility of reverse causality between common mental disorders and quality of life should not be ruled out, bringing about the reflection on the extent to which poor quality of life could lead to depression and anxiety in adolescents, and vice-versa.

Knowledge about the association between poor quality of life and CMD should sensitize health professionals to questions of an emotional nature of their patients and also subsidize actions aimed at preventing such disorders in asthmatic patients. These findings emphasize the multidisciplinary teams' need to pay attention to the emotional aspects of asthmatic patients, especially those with less experience with this disease. It is believed that the search for good quality of life in programs for asthmatic adolescents is of key importance for these patients to have a better relationship with their friends, family, society and themselves.

Referências

1. Kuschinir MCC. *Fatores de risco para hipertensão arterial na adolescência* [tese de doutorado]. Rio de Janeiro: Instituto de Medicina Social da UERJ; 2004.

2. Quaresma MR. *Development and validation in instrument to measure sexual function in female Brazilian rheumatoid arthritis patients* [dissertação de mestrado] EUA: School of Graduate Studies of Mcmaster University; 1995.

3. Sawyer MG,Reynolds KE,Couper JJ,French DJ,Kennedy D,Martin J,Staugas R,et al. Health-related quality of life of children and adolescents with chronic illness a two year prospective study. *Qual Life Res* 2004;13(7): 1309-19.

4. Sole D, Vanna A T, Yamada E, Rizzo M C, Naspitz CK. International study of Asthma and Allergies in Childhood (ISAAC) written questionnaire: validation of the asthma component among Brazilian children. *Investig Allergol Clin Immunology* 1998; 8(9): 376-82.

5. Juniper EF. How important is quality of life in pediatric asthma? *Pediatr Pulmonol* 1997; 15: 17-21.

6. WHO (World Health Organization). *Program for adolescent health and development: report of WHO/ UNFPA/Unicef. Study group on programming for adolescent health*. Genève; WHO/UNFPA/UNICEF; 1999. (WHO Technical Report series,886).

7. Bowling, A. et al. A multidimensional model of the quality of life in older age. *Aging & Mental Health* 2002; 6: 355-71.

8. Goldbeck L, Koffmane K, Lecheler J, Thiessen K, Fegert JM. Disease severity, mental health, and quality of life of children and adolescents with asthma. *Pediatr Pulmonol*. 2007; 42(1): 15-22.

9. Nogueira, K T. *Asma e transtornos mentais comuns em funcionários de uma universidade no Estado do Rio de Janeiro – Estudo Pró-Saúde* [dissertação de mestrado]. Rio de Janeiro: Instituto de Medicina Social da UERJ; 2002.

10. Neves JEP, Behar V S, Cordas T. Aspectos psiquiátricos e psicológicos do paciente alérgico. *Rinite Alérgica* 1997; Editorial.

11. Meneses CR. *Morbidade psiquiátrica menor entre adolescentes cronicamente doentes atendidos em um ambulatório especializado no Rio de Janeiro* [dissertação de mestrado]. Rio de Janeiro: Instituto de Medicina Social da UERJ; 2002.

12. GINASTHMA - Global initiative for asthma management and prevention *NHLB/WHO Workshop Report*, US Department of Health and Human Services National Institutes of Health, Bethesda 2002; 95: 36-59.

13. Yellowlees PM, Ruffin RE. Psychological defences and coping styles in patients following a life-threatening attack of asthma. *Chest* 1989; 95: 1298-1303.

14. Juniper EF, Guyatt GH, Feeny DH, Ferrie PJ, Griffith LE, Townsend M. Measuring quality of life in children with asthma. *Qual Life Res* 1996; 5: 35-46.

15. La Scala C, Naspitz C, Solé D. Adaptação e validação do Pediatric Asthma Quality of Life Questionnaire (PAQLQ-A) em crianças e adolescentes brasileiros com asma. *J Pediatr* 2005; 81: 54-60.

16. Mari JJ, Willians P. A comparison of the validity of two psychiatric screening questionnaires (GHQ-12 and SRQ-20) in Brazil, using Relative Operating Caracteristic (ROC) analysis. *Psychological Medicine* 1985; 15: 651-9.

17. Weich S, Lewis G. Poverty, unemployment, and common mental disorders: population based cohort study. *British Medical Journal*,1998; 317: 115-9.

18. Stanfeld S A, Marmot G, Social class and minor psychiatric morbidity. A validated screening survey using the General Health Questionnaire in British civil servants. *Psychological Medicine*,1992; 22: 739-49.

19. Goldberg DP, Blackwell B. *The detection of psychiatric illness by questionnaire*. Maudsley Monograph n. 21. London: Oxford University Press; 1970.

20. Goldberg DP, Williams P. T*he User's Guide to the General Health Questionnaire*. Nelson: Windsor; 1988.

21. Juniper EF, Guyatt GH, Streiner DL, King DR.Clinical impact versus factor analysis for quality of life questionnaire construction. *J Clin Epidemiol* 1997 Mar; 50(3): 233-8.

22. RDCT - R Development Core Team. *R: A language and environment for statistical computing.* R Foundation for Statistical Computing, Vienna, Austria: 2006. Disponível em: http://www.R-project.org [Acessado em 15 de março de 2007]

23. Skov T, Deddens J, Endahl L. Prevalence proportion ratios: estimation and hypothesis testing. *Int J Epidemiol* 1998; 27: 91-5.

24. Barros AJ, Hirakata VN. Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio. BMC *Med Res Methodol* 2003; 20(3): 21.

25. Cabral AL, Carvalho WA, Chinen M, Barbiroto RM, Boueri FM, Martins MA.Are International Asthma Guidelines effective for low-income Brazilian children with asthma? *Eur Respir J* 1998; 12(1): 35-40.

26. Zorc Jj, Pawlowski Na, Allen Jl, Bryant-Stephens T, Winston M,et al. Development and validation of an instrument to measure asthma symptom control in children. *J Asthma* 2006; 43(10): 753-8.

27. Bosley CM, Fosbury JA, Cochrane GM. The psychological factors associated with poor compliance with treatment in asthma. *Eur Respir J* 1995; 8(6): 899-904.

28. Lavoie KL, Bacon SL, Barone S, Cartier A, et al, What is worse for asthma control and quality of life: depressive disorders, anxiety disorders, or both? *Chest* 2006; 130: 1039-47.

29. Strachan, D, Gerritsen, J. Long-term out-come: population data. *Eur Respir J* 1996; 9: 42-7.

30. ATS - American Thoracic Society. Guidelines for the evaluation of impairment/disability in patients with asthma. *Am Rev Respir Dis* 1993; 147: 1056.

31. Burr ML, Wat D, Evans C, Dunstan FD, Doull IJ; British Thoracic Society Research Committee Asthma prevalence in 1973, 1988 and 2003. *Thorax* 2006; 61(4): 296-9.

32. Newacheck PW, Mcmamanus MA, Fox HB. Prevalence and impact of chronic illness among adolescent. *American Journal of Diseases of Children* 1999; 145: 1367-73.

33. Machado AS, Machado DT, Portela, PG. Frequência de depressão em pacientes ambulatoriais com asma moderada e grave. *Rev Bras Alerg Imunopatol* 2000; 3: 90-7.

34. Myers, J. K.; Weissman, M. M.; Tischeler, G. E., 1994. Six month prevalence of psychiatric disorders in three communities. *Arch Gen Psychiatry* 1994; 41: 959-70.

35. Coney, J. C.; Fechner-Bates, S.; Schwenk, T. L. Prevalence, nature, and co-morbidity of depressive disorders in primary care. *Gen Hosp Psychiatric* 1994; 16: 267-76.

36. Gillaspy SR, Hoffa L, Mullins LL, Vanpelt JC, Chaneyj M. Psychological distress in high-risk youth with asthma. *Journal of Pediatric Psychology* 2002; 27(4): 363-71.

37. Measurement invariance in the General Health Questionnaire-12 in young Australian adolescents. *Eur Child Adolesc Psychiatry* 2004; 13(1): 1-7.

38. Suris JC, Chronic conditions and adolescence. *J Pediatr endocrinal Metab* 2002; 16(S2): 247-51.

39. Ford ES, Mannino DM, Homa DM, Gwynn C, Redd SC, Moriarty DG, Mokdad AH: Self-reported asthma and health-related quality of life: findings from the behavioral risk factor surveillance system. *Chest* 2003; 123: 119-27.

40. Opolsky M, Wilson I. Asthma and depression: a pragmatic review of the literature and recommendations for future research. *Clin Pract Epidemol Ment Health* 2005; 27: 1-18.

41. ACAM - Australian Centre for Asthma Monitoring: *Measuring the impact of asthma on quality of life in the Australian population*. Canberra: Australian Institute of Health and Welfare; 2004.

42. Bonala SB , Pina D, Silverman BA, Amara S, Bassett CW, Schneider AT. Asthma Severity, Psychiatric Morbidity, And Quality Of Life: Correlation With Inhaled Corticosteroid Dose. *Journal of Asthma* 2003; 40(6): 691-9.