







QUALITY OF LIFE IN ADOLESCENTS RELATED TO SEX, FAMILY INCOME AND PHYSICAL ACTIVITY

QUALIDADE DE VIDA EM ADOLESCENTES RELACIONADA A SEXO, RENDA FAMILIAR E PRÁTICA DE ATIVIDADE FÍSICA

CALIDAD DE VIDA DE ADOLESCENTES RELACIONADA CON EL SEXO, INGRESO FAMILIAR Y LA ACTIVIDAD FÍSICA

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Funding: No funding.

Submitted on: 2018/12/30

Approved on: 2019/07/08

ABSTRACT

Objective: to assess adolescents' self-perception of their quality of life and the relationship between quality of life and gender, family income and physical activity. **Methods:** epidemiological, cross-sectional and analytical study. A total of 633 adolescents from 10 to 16 years old, from public elementary and high school, were surveyed. Data collection was performed in August 2016. The instrument KIDSCREEN-27 was used to determine quality of life. Sociodemographic and physical activity data were collected. The analysis was performed by descriptive statistics, bivariate analysis and tables with absolute and relative values. One-way ANOVA, Student's t-test and Kruskal-Wallis H tests were applied. **Results:** the adolescents were, on average, 13.82 years old, mostly female, mixed race / brown, attending the first year of high school and with family income of up to three minimum wages. Approximately 60% were sedentary and, among those who performed some physical activity, did it on two or three days a week. There was a statistically proven association ($p < 0.001$) for higher means of quality of life score among participants who performed physical activity. The average KIDSCREEN-27 scores were higher in males, with a statistically proven association, except for the social support domains and peer group and school environment. **Conclusions:** it was found that female adolescents had lower perception regarding their quality of life and that the performance of physical activities is an important factor for the increase of this perception.

Keywords: Quality of Life; Exercise; Adolescent; Sex; Income.

RESUMO

Objetivo: avaliar a autopercepção de adolescentes sobre a sua qualidade de vida e a relação entre a qualidade de vida e sexo, renda familiar e prática de atividades físicas. **Métodos:** estudo epidemiológico, transversal e analítico. Pesquisaram-se 633 adolescentes de 10 a 16 anos, do ensino público fundamental e médio. A coleta dos dados foi realizada no mês de agosto de 2016. O instrumento KIDSCREEN27 foi usado para determinar a qualidade de vida. Foram coletados dados sociodemográficos e sobre prática de atividades físicas. A análise foi feita por estatística descritiva, análise bivariada e usadas tabelas com valores absolutos e relativos. Aplicaram-se os testes ANOVA um fator, teste T de Student e H de Kruskal-Wallis. **Resultados:** os adolescentes tinham, em média, 13,82 anos, maioria do sexo feminino, cor/raça parda, cursando o primeiro ano do ensino médio e com renda familiar de até três salários mínimos. Aproximadamente 60% eram sedentários e, entre os que realizavam alguma atividade física, faziam-na em dois ou três dias na semana. Houve associação estatisticamente comprovada ($p < 0,001$) para maiores médias de escore de qualidade de vida entre os participantes que realizavam atividade física. As médias dos escores KIDSCREEN27 foram maiores no sexo masculino, com associação estatisticamente comprovada, com exceção dos domínios suporte social e grupo de pares e ambiente escolar. **Conclusões:** constatou-se que os adolescentes do sexo feminino apresentaram percepção inferior quanto à sua qualidade de vida e que a realização de atividades físicas é um fator importante para o incremento dessa percepção.

Palavras-chave: Qualidade de Vida; Exercício; Adolescente; Sexo; Renda.

How to cite this article:

Fonseca ADG, Cunha FO, Barbosa IA, Silva JO, Araújo DD, Silva CSO. Quality of life in adolescents related to sex, family income and physical activity. REME – Rev Min Enferm. 2019[cited _____];23:e-1245. Available from: _____ DOI: 10.5935/1415-2762.20190093

RESUMEN

Objetivo: evaluar la autopercepción de los adolescentes sobre su calidad de vida y la relación entre calidad de vida y sexo, ingreso familiar y actividad física. **Métodos:** estudio epidemiológico, transversal y analítico. Se encuestó a un total de 633 adolescentes de 10 a 16 años de edad de escuelas primarias y secundarias públicas. La recogida de datos se realizó en agosto de 2016. Se utilizó el instrumento KIDSCREEN27 para determinar la calidad de vida. Se recogieron datos sociodemográficos y de actividad física. El análisis se realizó mediante estadística descriptiva, análisis bivariado y tablas con valores absolutos y relativos. Se aplicaron ANOVA unidireccional, la prueba t de Student y las pruebas H de Kruskal-Wallis. **Resultados:** los adolescentes tenían, en promedio, 13,82 años, eran en su mayoría mujeres, de tez oscura, cursaban el primer año de la escuela secundaria y tenían ingresos familiares de hasta tres salarios mínimos. Aproximadamente el 60% eran sedentarios y, entre los que realizaban alguna actividad física, lo hacían dos o tres días a la semana. Hubo una asociación estadísticamente comprobada ($p < 0.001$) para promedios más altos en la calidad de vida entre los participantes que realizaban actividad física. Los puntajes promedio de KIDSCREEN27 fueron más altos entre los varones, con una asociación estadísticamente comprobada, a excepción de los dominios apoyo social y grupo de pares y ambiente escolar. **Conclusiones:** se constató que las adolescentes tenían una percepción más baja con respecto a su calidad de vida y que la práctica de actividades físicas es un factor importante para aumentar esta percepción.

Palabras clave: Calidad de Vida; Ejercicio; Adolescente; Sexo; Renta.

INTRODUCTION

The process of physical, psychological and physiological transformation that happens during adolescence in association with the social context and the experiences inherent in this phase of life highlights it as a crucial period for the assessment of an individual's health status, since it involves issues such as identity building and maturing into adulthood. Additionally, it presents situations that may cause risks to physical and psychological health. A deeper understanding of how adolescents perceive some issues in their lives is essential for analyzing the health of this age group.¹ A key point of adolescent health that has been the subject of much research in recent decades is the quality of life related to health (HRQoL).²

In 1947, the World Health Organization (WHO) defined that health should be not only the absence of disease, but also a subjective dimension of physical, mental and social well-being. Thus, the concept is constructed by clinical and epidemiological indicators, but without disregarding the individual's perception of the different domains of their life.³ Measurement of HRQoL is as relevant a health indicator as clinical data and has been used in many studies to determine intervention, prevention and health promotion measures for adolescents. The elaboration of studies that validate and evaluate the application of instruments to evaluate the quality of life in this group has been the goal of some researchers in recent years.^{4,5}

Instruments for quality of life assessment are generally divided into domains that address the physical, psychological, environmental and social dimensions.⁶ One of these instruments that has been widely used and relevant is KIDSCREEN, which was developed in the Screening and Promotion for Health-Related Quality of Life in Children and Adolescents - The European Public Health Perspective, which took place between 2001 and 2004 in several European countries. KIDSCREEN has three versions, the first with 52 questions distributed in 10 domains. To facilitate the application of the instrument, the original version was synthesized into two smaller versions, with 27 and 10 questions. The validity of this instrument has been widely tested in children and adolescents of different nationalities and cultures.^{4,7}

A systematic review of 14 articles showed that physical activity was consistently associated with improved quality of life (QoL). Physical activity was also strongly associated with psychological well-being.⁸ A meta-analysis study consisting of 49 controlled clinical trials identified a 48% decrease in anxiety levels in the study group when compared to the control group.⁹ In addition, a randomized clinical trial specifically analyzed psychological symptoms and concluded that physical activity can minimize symptoms of depression and stress, thus improving QoL.¹⁰ Physical activity is therefore an important variable for the adolescent population. It represents a health promotion factor by preventing cardiovascular disease, anxiety, depression, among others.¹¹

HRQoL in adolescents is an important indicator for this population, due to its impact on adulthood and is subject to interaction with sociodemographic characteristics such as gender and income, in addition to physical activity, which is included in one of the KIDSCREEN-27 domains. Thus, the objective of this study was to evaluate the self-perception of school adolescents about their quality of life and the relationship established between their quality of life and gender, family income and physical activity.

METHODS

This is an epidemiological, cross-sectional and analytical study. The population of this research was composed of adolescents from 10 to 16 years old, enrolled in public elementary and high school in the city of *Montes Claros, Minas Gerais*.

The population of this study consisted of adolescents of both sexes, aged between 10 and 16 years, enrolled in 2016 in the elementary and high school of the municipality. Age stratification was used to select students in order to meet the research objectives.

The sample size was established in order to estimate population parameters with prevalence of 0.50 - which ensured the largest sample size - 95% confidence level and 5% sampling

error. Correction for the finite population and correction for the effect of the design was performed, adopting *deff* equal to 1.5. A 10% increase was also established to compensate for possible non-responses and losses. The calculations showed the need to examine and interview at least 634 individuals.

The sample selection process occurred by probabilistic cluster, in two stages. For the first stage, the population involved was allocated in four regions of the city of Montes Claros: north, south, east and west. Subsequently, the number of state public schools was listed, quantifying the number of students enrolled by region. In total, 63 schools and 77,833 students were included and the probability proportional to size (PPS) was used to draw the schools that represented the geographic regions of the city.

In the second stage, the sample weights were calculated by the product of the inverse inclusion probabilities for each region and calibrated considering the projection of the number of adolescents enrolled in schools located in the geographic strata in 2016. The sample weight of the northern region was of 140 units of the population, represented by the sample unit U_k , from the south 109, east 145 and west 97.

Subsequently, the selection of adolescents took place, adopting the systematic random sampling. In the refusal to participate, the previous one was replaced in the registration list. Thus, the study provided the same chance of participation to adolescents. Each student received a manual of instructions and procedures for data collection. The final sample was 635 students and obeyed the representativeness of the population.

Of the 635 students, only two refused to participate in this study. Adolescents who reported renal, inflammatory, infectious, hepatic and hematological diseases were excluded; in pregnancy; and on medication that affected the metabolic and hemodynamic profile.

Data collection was performed in August 2016. The team underwent training and capacity building. The instrument was composed of a sociodemographic questionnaire to evaluate the variables gender, age, income, number of residents in the house and school year. Participants also answered about the practice of physical activity through the short version of the International Physical Activity Questionnaire (IPAQ) validated for Brazilian adolescents, which classifies individuals as active, very active, irregularly active and sedentary,¹² in addition to the 27 questions of the translated and adapted KIDSCREEN-27 instrument.⁴

The analysis of the KIDSCREEN-27 was made by assessing the scores of the questions in general and the five domains that compound the instrument: physical well-being, psychological well-being, autonomy and relationship with parents, social support and peer group and school environment. The answers to the items are numbered from

one to five and quantify the interviewee's level of perception regarding what is addressed in each question. The response options range from "very bad" to "excellent", "nothing" to "totally" or "never" to "always".¹³ The scores were calculated using the model proposed by Alves, Pedrosa and Pinto, which follows the determinations of the KIDSCREEN Handbook.¹⁴ Data analysis was performed using the Statistical Package for Social Science (SPSS) version 20.0. Sociodemographic and physical activity variables were presented as absolute values and as percentage, mean and standard deviation (SD). KIDSCREEN-27 scores were presented as means and SD. A bivariate analysis was performed to determine if there is a relationship between the means of KIDSCREEN-27 scores and the variables gender, physical activity and income. One-way ANOVA tests, Student's t-test and Kruskal-Wallis H test were applied, the latter only for the psychological and general well-being scores in association with income, as they presented non-homogeneous variance. A significance level of 5% was adopted in all tests and a confidence interval (CI) of 95%.

The project of this study was approved by the Ethics Committee of the *Universidade Estadual de Montes Claros* (UNIMONTES) with opinion report number 186.375. Upon agreement, the Informed Consent Form (ICF) was signed by the participant and the researcher, as regulated by the provisions of Resolution nº 466/12 of the Brazilian *Conselho Nacional de Saúde* of the *Ministério da Saúde* (CNS/MS).

RESULTS

Among the 633 adolescents participating in this research, 60.2% were female (Table 1), the most prevalent race was brown (57.5%), the average age was 13.82 (\pm 1.72) years and most students were in the first year of high school. The income of most of these adolescents' families was up to three minimum wages (83.9%) and the number of residents per household from four or more to 79.7% of households.

The investigation revealed that most young people are sedentary and answered "no" to practice physical activity (59.9%). Among those who practice, the most common is on one (41.2%) and three (19.9%) days a week (Table 1).

Table 1 - Socio-demographic and physical activity profile of adolescent students in public schools. *Montes Claros, MG, Brazil, 2018*

Variables	n	%
Gender		
Female	381	60.2
Male	252	39.8
Total	633	100

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Table 1 - Socio-demographic and physical activity profile of adolescent students in public schools. *Montes Claros, MG, Brazil, 2018*

Variables	n	%
Race		
White	118	18.7
Brown	362	57.5
Asian	21	3.3
Indigenous	20	3.2
Black	109	17.3
Total	630	100
Family Income		
Up to 3 minimum wages	516	83.9
From 3 to 10 minimum wages	75	12.2
From 10 to 20 minimum wages	11	1.8
More than 20 minimum wages	13	2.1
Total	615	100
Number of residents in the house		
2	29	4.6
3	99	15.7
4	238	37.8
5 or more	263	41.9
Total	629	100
School Year		
5th grade elementary school	29	4.6
6th grade elementary school	93	14.9
7th grade elementary school	66	10.6
8th grade elementary school	95	15.2
9th grade elementary school	91	14.6
1st year high school	204	32.7
2nd year high school	46	7.4
Total	624	100
Do you practice physical activities?		
Yes	252	40.1
No	377	59.9
Total	629	100
How many times per week?		
1	250	41.2
2	57	9.4
3	120	19.9
4	73	12
5	26	4.3
6	4	0.8
7	50	8.2
Total	606	100

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Table 2 - Perception of quality of life as measured by the KIDSCREEN-27 instrument in school adolescents of both genders. *Montes Claros, MG, 2018*

Dimension	Mean (SD)
Physical well-being	54.3 (18.7)
Psychological well-being	70.0 (17.8)
Autonomy and relationship with parents	64.1 (20.7)
Social support and peer groups	75.1 (22.2)
School Environment	66.3 (20.3)
Overall	66.2 (14.7)

It is important to point out that some variables did not have 100% response rate of the sample, solely due to non-responses to the items.

From the bivariate analysis a relationship was determined between the KIDSCREEN-27 score values in its five domains and the general between the variables gender and physical activity practice, as well as family income. Girls had lower mean scores when compared to boys and this association was statistically proven in most domains, except for “social support and peer group” and “school environment”. The practice of physical activity proved to be determinant for higher mean scores in all domains, with statistical significance (Table 3).

Tabela 3 - Perception of quality of life measured by the KIDSCREEN instrument in adolescents according to gender and physical activity. *Montes Claros, MG, Brazil, 2018*

Dimension	Mean (SD)		p-value
	Gender		
	Female	Male	
Physical well-being	49 (17.6)	62.2 (17.5)	<0.001
Psychological well-being	66.7(18.6)	75 (15)	<0.001
Autonomy and relationship with parents	62 (21.1)	67.4 (19.7)	0.002
Social support and peer group	74.9(21.9)	75.3 (22.8)	0.861
School environment	66.5(20.8)	65.8 (19.4)	0.682
General	63.9 (15)	69.7 (13.4)	<0.001
Do you practice physical activity?			
Dimension	Yes	No	p-value
Physical well-being	59.7 (18)	46.3 (16.8)	<0.001
Psychological well-being	72.9(16.4)	65.4 (18.9)	<0.001
Autonomy and relationship with parents	65.6(20.1)	61.87(21.4)	0.026
Social support and peer group	77.5(20.2)	71.5 (24.5)	0.001
School environment	67.2(19.8)	64.8 (20.8)	0.140
Overall	68.9(13.7)	62.1 (15.2)	<0.001

When assessing KIDSCREEN-27 scores in relation to family income, no statistically proven associations were obtained; however, in the domain “physical well-being” there was a tendency of the score means to increase with increasing wages (Table 4).

Table 4 -Perception of quality of life measured by the KIDSCREEN instrument in adolescents as a function of family income. *Montes Claros, MG, Brazil, 2018*

Dimension	Up to 3 minimum wages Mean (SD)	From 3 to 10 minimum wages Mean (SD)	From 10 to 20 minimum wages Mean (SD)	More than 20 minimum wages Mean (SD)	p-value
Physical well-being	54 (18.57)	54.7 (18.7)	58. (18.8)	67.3 (22.7)	0.08
Psychological well-being	70.3 (18.3)	69.4 (16.2)	61.8 (8.2)	67.3 (17.5)	0.158
Autonomy and relationship with parents	63.9 (21)	66.9 (17.9)	55.8 (22.8)	67.9 (21.5)	0.329
Social support and peer group	74.9 (22.4)	76 (22.6)	70 (16.6)	79.8 (12.2)	0.741
School environment	66.1 (20.1)	66.8 (21.9)	67.5 (15.2)	66.1 (21.2)	0.989
Overall	66 (15)	66.8 (14.2)	62.6 (6.9)	70.6 (9.1)	0.434

DISCUSSION

KIDSCREEN-27 scores were influenced by gender and physical activity, but not by family income. Boys had better perception of their quality of life when compared with girls, and those who perform physical activity showed better perception when compared to sedentary ones.

Most teenagers answered that they do not practice any kind of physical activity. Physical inactivity is a determining factor for overweight and obesity among children and adults and has been a direct repercussion of young people's lifestyle and quality of life over the last decades.¹⁵ It is important to highlight that physical activity is related to improved quality of life of children and adolescents,¹⁶ which is reinforced by the analysis of this research in which adolescents who responded positively to the practice of physical activities had higher KIDSCREEN-27 mean score in all domains.

The habit of exercising during childhood and adolescence is important for its perpetuation in adulthood. This, in turn, is an effective health promotion strategy, as physical activity is a protective factor against cardiovascular and non-contagious chronic diseases.¹⁷ Adolescents also acquire physical fitness, which will reflect on their performance in adulthood, as well as maximization of bone mineral mass level.¹⁸⁻²⁰

The practice of physical activities is a form of leisure that aims to reduce the stressful daily routine of individuals, presenting itself as a pleasant and addictive activity, which reduces uncomfortable feelings such as anxiety, irritability and depression, in addition to maintaining fitness and improvement of the quality of life. From the psychological point of view, the practice of physical activities implies benefits about the self-image and self-esteem of the practitioner. And it is physically related to decreased cardiovascular disease, premature death, reduced stroke, breast cancer, colon cancer, and type II diabetes mellitus.²¹⁻²³

Researches have shown that more than half of adolescents do not meet recommendations for physical activity.^{24,25} Currently, the recommendation for children and adolescents is 60 minutes or more of daily moderate physical activity on five or more days of the week, at least 300 minutes per week of exercise.²⁶ In this

study, it was found that among young people who responded to perform some type of activity they usually do it for two or three days a week, thus being below what was recommended.

Currently, physical inactivity is a major health risk. An individual considered physically inactive is one who performs a minimum of physical activity in his daily routine, presenting weekly energy expenditure of 500 kcal from locomotion, work, leisure and domestic activities. This physical inactivity is a consequence of the increasing technological advance that generated more comfort to people's lives, reducing the incentive to move due to the various leisure options present in their homes, such as television, computer, video games, among others.²¹⁻²³

For both sexes the domain with the highest average score was social support, with 75.11 (\pm 22.24), the overall mean score for both sexes was 66.18 (\pm 14.69). The highest social support score was also verified by Alves *et al.*⁵, with a score of 80.71 among the participants of their research. Social support also stood out as a strong point among diabetic and obese adolescents investigated in other researches using the Pediatric Quality of Life (PedsQL) instrument.^{27,28}

The domain of social support is strengthened in adolescents, as they are inserted in social groups with whom they identify and seek approval. The school environment is very appropriate to social interactions, as it facilitates the communication of adolescents with people other than their families and with whom they can identify, because they are sharing the same phase of life. There is a need for adolescents to interact and make new friends with others who are experiencing experiences like their own, and school is where these meetings will take place.²⁹

KIDSCREEN-27 score means were higher for males in all domains. For the psychological wellbeing domain, a possible justification is that the earlier sexual maturation for girls leads to hormonal changes that reflect on the psychological state, causing uncertainties about self-image, insecurities and uncertainties regarding personality and future. In addition, earlier female puberty tends to lead girls to abandon innocent aspects of childhood earlier and to gain a level of criticism of

themselves and their experiences. This maturity generates a critical sense that may diminish the perception of quality of life in the domains evaluated by KIDSCREEN-27.²⁹

The domain physical well-being was the one with the lowest score in females (49 ± 17.6). This can be explained by the culture regarding gender roles in Brazilian society. While participation in sports and physical activity among boys is more common and valued, girls have less social incentive to engage in such activities with more focus on beauty care and household chores.³⁰ A different pattern is also evidenced regarding physical activity practiced by men and women. Men tend to perform more team sports while women do individual activities like gymnastics, dancing or walking. Thus, the result obtained in the physical wellbeing domain may be related to the type of activity developed in Physical Education classes, which are usually collective practices that appeal to male adolescents.³¹

Regarding the domain autonomy and relationship with parents, which also showed a difference between males and females (67.4 and 62.0, respectively), it can be highlighted that culturally girls are more overprotected by their parents, being more restricted the possibility of exercising autonomy outside the home environment.³² Adolescence itself is a period of conflict in the relationship between parents and children.

Family income was not associated with the average KIDSCREEN-27 score values in any domain. Only in the physical well-being domain, there was a tendency to increase the score as the income increased. In this case, it is observed that income does not have a great impact on quality of life, but in relation to the domain that concerns health, there is a slight association, which is also present in other studies that stipulate that education and care with health are associated with social class.³³

FINAL CONSIDERATIONS

The assessment of health-related quality of life is an important indicator, as it represents a considerable impact on health, as it interferes in various domains in the adolescent's life. The impact of the quality of life level can reflect on adulthood and its preservation should be considered as a health promotion strategy. External and inherent factors in adolescents may influence their perception of quality of life. In this study, it was found that female adolescents have a lower perception of their quality of life and that physical activity is an important factor to increase this perception. Family income, in turn, is not associated with this indicator. A deeper understanding of adolescents' QoL allows them to understand their health better. This deepening can be a management tool, aiming at guiding the organization of resources and decision-making processes for the improvement of this quality of life of school adolescents, especially females, who presented worse perception of QoL. The

results of this study should be viewed considering its strengths and limitations. Among the strong ones stands out the methodological accuracy used in the processing and analysis of the variables of central interest. Regarding the limitations, it can be emphasized that some descriptive characteristics potentially of interest regarding the quality of life could not be studied, as they are not of interest to the study.

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