

Adolescents' knowledge about the benefits of physical exercises to mental health

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Abstract *Adolescence is a phase of several structural and functional transformations. Physical exercise is capable of inducing adaptive plasticity on the nervous system, reducing the risks of future psychiatric pathologies. This research aimed to investigate adolescents' knowledge about the benefits of physical exercise on mental health. This is a cross-sectional study, carried out in a state school from a city in the Midwestern region of Minas Gerais. Data collection included a self-developed questionnaire to measure knowledge about the benefits of Physical Exercise on Mental Health, an International Physical Activity Questionnaire and a socioeconomic questionnaire from the Brazilian Association of Research Companies. Data were analyzed with descriptive statistics tools, Kruskal-Wallis and chi-square tests, with a significance level of 5%. We found that individuals that are more active had greater knowledge about the benefits of physical exercise to mental health in relation to sedentary individuals. Thus, knowledge can be a protective factor against sedentarism and physical inactivity, significantly improving the aspects related to the quality of life of the adolescent.*

Key words *Adolescent, Physical exercise, Mental health, Knowledge*

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Introduction

Adolescence is situated in the chronological period of 10-19 years (WHO)¹. It is conceptualized as a phase of several structural and behavioral transformations, especially in the psychic, physical, biological and social aspects². For statistical data, we can divide it into three stages: initial adolescence (10-13 years), intermediate adolescence (14-16 years) and final adolescence (17-19 years)³.

During adolescence, the human brain undergoes substantial changes for the subject's own and usual development and improvement. These essential modifications enable the adolescent to develop and acquire a balanced, autonomous and healthy adult brain⁴. Simultaneously, in this period, several concerns can arise, in addition to the appearance of mental disease⁵.

Transformations occur in neurochemistry and neurotransmission in the adolescents' nervous system⁶. New brain connections are established and there is maturation of the prefrontal cortex, the region responsible for decision-making and impulse control. Modifications also occur in the brain's reward system. Thus, reward-driven behaviors tend to be repeated and learned in search for pleasure^{7,8}.

Anxiety, nervousness, stress, fear and insecurity are the main obstacles experienced by young people in the middle and late stages of adolescence. All of this is due to the expectations created and experienced for the entrance exam and entry into the labor market⁹. Eating disorders, gender discrimination and violence are also prerequisites for the development of these mental disorders¹⁰. Thus, these manifestations contribute to young people being vulnerable to the use of psychotropic drugs¹¹.

Psychotropic drugs are those acting on the Central Nervous System (CNS), producing changes in behavior, mood and cognition¹². This type of medication is often prescribed for adolescents suffering from mental disorders¹³. Such use is occurring early, increasingly and in exacerbated and indiscriminate fashion¹⁴⁻¹⁷.

Like psychotropic medications, physical exercise can be used as a possible therapy for the treatment of some cases of mental disorders. It can replace or reduce the use of medications and promote mental health¹⁸.

Evidence indicates that physical exercise brings benefits to brain function and can improve learning and memory in human beings^{18,19}. It also provides feelings of joy, satisfaction and well-being,

reducing anxiety and depression^{20,21}. Other benefits of exercise include better cerebral vascularization, stimulated neurogenesis, decreased incidence of dementia and increased levels of brain-derived neurotrophic factors in the hippocampus²¹⁻²³. In this perspective, physical exercise is an activity favorable to adolescent growth and development and becomes a therapeutic adjunct in the treatment of mental illness²⁴⁻²⁶.

Several factors are related to adolescent practice of physical activity. A recent study argues that knowledge about the benefits of physical activity to health and well-being is related to the regular practice of physical exercises²⁷.

Investigations that seek to identify and discuss adolescents' knowledge about healthy life habits, such as physical activity are relevant, since they have the potential to increase indicators for the elaboration of public health care policies for these individuals both in primary health care and school settings.

Thus, this study aimed to investigate the knowledge of adolescents about the benefits of physical exercise to mental health.

Methodology

This is a transversal, descriptive and analytical study, with a quantitative approach, carried out in a state school in a city of the Midwestern region of Minas Gerais.

In order to include/exclude adolescents, the following criteria were adopted: adolescents aged 14-19 years, enrolled in the 1st to 3rd high school year at the school under study, which were in the classroom on the day and time of data collection.

A profile card was used in data collection to characterize the sample studied. A structured questionnaire on Physical Exercise and Mental Health developed by the researchers was also used, which addressed the adolescents' knowledge about the benefits of physical exercise on mental health. For the elaboration of this questionnaire, we took into account the search of the topic in published papers and specific literature. The categories questioned were structural and functional knowledge of the central nervous system, neurogenesis and neuroplasticity, knowledge about memory and learning, knowledge about anxiety, depression, stress, self-image, self-esteem, dementia and mental well-being^{4-7,10,18,21,24}. We chose to produce a material because of the complexity of some questionnaires found in the literature and because they did not meet our objective.

The tool was first tested in a sample of 10 adolescents who did not participate in the study, in order to evaluate the understanding of the questions. The questionnaire was also analyzed by teachers of the school under study, in order to evaluate the understanding, comprehension and complexity of the questions. The process was based on a study by Gazzinelli et al.²⁸. The final questionnaire was composed of 20 closed questions, in which each correct answer added up one point. Higher scores indicated greater knowledge of adolescents.

The adolescents answered the questionnaire individually to properly trained researchers. The collection process lasted thirty days. The International Physical Activity Questionnaire - IPAQ, short version, validated for the Brazilian population, and the socioeconomic questionnaire of the Brazilian Association of Research Companies, ABEP / 2014 were also used²⁹⁻³¹.

The collected data were entered and checked in a spreadsheet of the program Microsoft Excel 2010 and transferred to the statistical program SPSS 19.0 (Statistical Package for the Social Sciences). The descriptive statistics analyses included calculations of means, medians and measures of variability of the quantitative variables and calculations of absolute and relative frequencies of the qualitative variables. The D'Agostino & Pearson omnibus normality test was used to verify the normality of the data of the study's quantitative variables. For the analysis of the association between the level of physical activity (very active, active, irregularly active A, irregularly active B, sedentary) and socioeconomic level (A, B1, B2, C1, C2 and D-E strata); regarding knowledge, considering data asymmetrical distribution, the Kruskal-Wallis test was used, followed by the Dunn test. For the analysis of the association between the socioeconomic level and the level of physical activity, the chi-square test was applied. The significance level established in all cases was 5% ($p \leq 0.05$).

The entire experimental protocol was approved by the Ethics Committee for Human Research (CCO) of the Federal University of São João del Rei, Campus Centro Oeste, Dona Lindu.

Results

The final sample consisted of 302 adolescents, aged 14-19 years, and students of this school. Of this total, 198 (65.6%) of the participants were female. Among the high school students, 121

(40%) were in the first year, 116 (38%) in the second year and 65 (22%) in the third year.

Concerning the socioeconomic level (Table 1), most young people belonged to classes C1 and B2, with a mean household income of R\$ 2,409.01-R\$ 4,427.36, according to ABEP/2014.

The mean score obtained in the questionnaire assessing the level of knowledge about physical exercise and mental health was 14.2 (71%) points, with a standard deviation of 2.2 points. The median was 14 points, with a three-point interquartile range.

In relation to the amount of time adolescents spend seated during a weekday and a weekend day, the mean obtained was 7.8 hours respectively during a weekday and 7.2 hours during a weekend day.

Regarding medication use, 58 (19.2%) of adolescents use continuous medications. Of these, 11 (3.6%) use psychotropic drugs.

Regarding the practice of physical exercises and sports, 168 (55.6%) answered that they practice, and among the female adolescents, 55% do not practice physical exercises and sports, while in male adolescents, 25% report not practicing these activities. Most participants, however, were classified as active in the criterion of physical activity level (Table 2).

When we analyzed the association between knowledge and the IPAQ questionnaire (Graph 1), we observed that individuals that are more active had a greater knowledge about the benefits of physical exercise to mental health. This result was statistically significant, $p=0.002$ in the Kruskal-Wallis test. Dunn's test indicated significant differences between the "sedentary" and the "very active", "active" and "irregularly active" categories. The lowest scores were obtained in group B irregularly active individuals and in sedentary individuals.

Table 1. Socioeconomic characterization of participants of the study, by Participants (N) and Percentage (%), ABEP/2014. (N = 302).

Class – ABEP/2014	Participants (N)	Percentage (%)	Mean household income (R\$)
A	19	6.3	20,272.56
B1	43	14.2	8,695.88
B2	86	28.5	4,427.36
C1	91	30.2	2,409.01
C2	49	16.2	1,446.24
D/E	14	4.6	639.78

Regarding the comparison and interpretation between the socioeconomic level of the participants and the level of physical activity practiced, and the correlation between the level of knowledge of the participants with the socioeconomic level, a $p > 0.05$ was found, which is statistically significant.

Table 2. Characterization of study participants regarding the level of physical activity, IPAQ, by Participants (N) and Percentage (%). (N = 302).

Classification IPAQ	Participants (N)	Percentage (%)
Very active	38	12.6
Active	175	57.9
Irregularly active A	30	9.9
Irregularly active B	38	12.6
Sedentary	21	7.0
Total	302	100%

Discussion

The results found in this study suggest that adolescents' knowledge about the benefits of physical exercise to mental health influences the habit of practicing physical activity. The participants that are more active showed a greater knowledge regarding the gains of physical exercise for mental health, $p = 0.002$.

Venâncio *et al.*³², when evaluating overweight, physical activity level and eating habits in school-children, verified the following issue: students classified as obese had a high level of knowledge about nutrition and unhealthy eating practices. Thus, the knowledge of the student did not favor the adoption of adequate nutritional habits. On the other hand, in this study, knowledge about the advantages of physical exercise to mental health, and about the various organic systems, has enabled pubertal children to practice healthier habits regarding sports, activities and physical exercises.

A study by Serafim *et al.*³³, which analyzed the influence of knowledge on the healthy lifestyle in the control of individuals' blood pressure showed that the understanding regarding body weight loss was a determinant condition for the adequate control of hypertension. This work corroborates

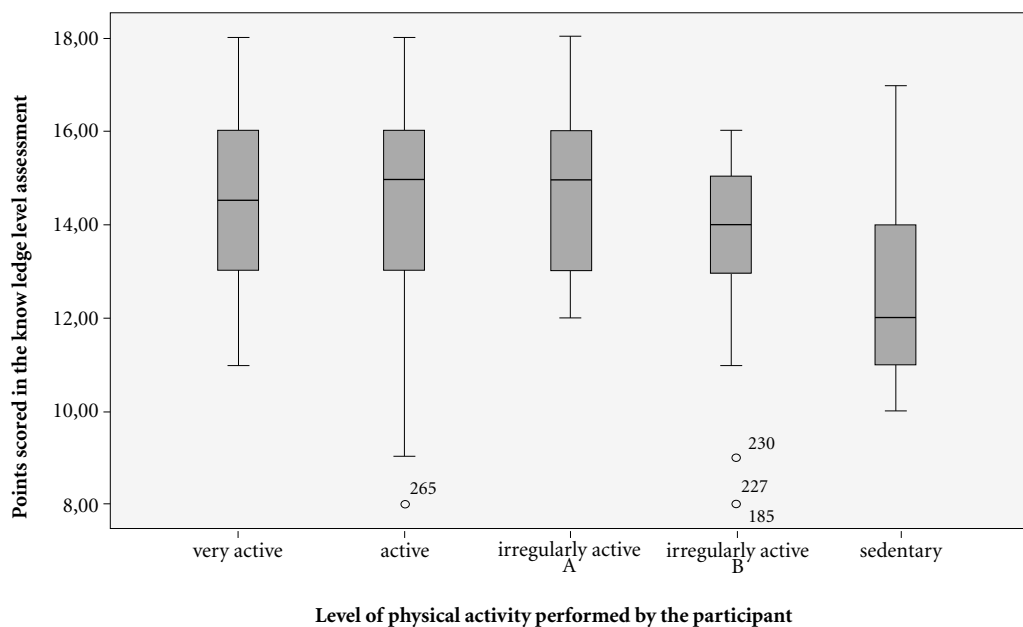


Chart 1. Distribution of points obtained in the knowledge level assessment, associated with the level of physical activity performed by the participants. Kruskal-Wallis test, $p = 0.002$.

with this study, where the knowledge acquired by adolescents favored the regular practice of physical activity, and individuals classified as sedentary showed less knowledge regarding the subject. Thus, we reinforce the initiative and importance of interventions in education and health.

However, in adolescents, knowledge alone does not result in transformed behavior or changes in habit or lifestyle. In this aspect, health education interventions should consider the individuality and social context of the pubescent, and have the function of stimulating behaviors, values, attitudes, creativity and the reflection of adolescents³⁴.

In literature, there are few studies related to physical activity and intervention in students' health³⁵. Thus, this work projects a look at the need and the intention of establishing and proposing interventions, informing and socializing young people to the healthy habit of practicing physical exercise, as well as awakening in the pubescent the interest for understanding and knowledge of the benefits of exercise to mental and body health. The results of this study facilitate the basis of public policies and subsidize the clinical practice of health professionals, especially in aspects that include education, prevention and promotion in mental health.

In this study, the relationship between the level of physical activity and the socioeconomic level of participants was not statistically significant. Studies that investigated the linkage between physical activity and social class found the most different results. Physical, social and environmental characteristics of the populations, besides the various questionnaires used and available in literature contribute to a great variability of the conclusions³⁶.

A study by Sousa et al.³⁷, which aimed to identify the relationship between the level of physical activity and the socioeconomic level of school adolescents concluded that individuals classified as more active belong to the lower economic classes, whereas the less active participants are consistent with the highest social classes³⁸.

Souza et al.³⁹ explain that adolescents from poorer socioeconomic classes use walking and cycling as a means of transport in their daily travel. They also report that lower-class female subjects are more involved in the household's daily chores. These aspects may contribute to the justification of the high level of physical activity practice among the less favored social classes⁴⁰.

When correlating young people's knowledge with their socioeconomic status, it was not pos-

sible to find statistical significance either. A study comparing public and private school adolescent students with regard to appropriate knowledge about contraceptive methods showed a low knowledge linkage with the economic class variable. It also justified that individuals belonging to better social classes have better access to safe references and ownerships. However, this information may not be enough and sufficient to determine the level of knowledge⁴¹. This study corroborates with this analysis. All survey participants belonged to a public school. Thus, we noted that even members of less favored economic classes have access to information, especially media and social networks with the use of the Internet⁴².

The benefits of regular physical exercise are already well documented and described in the literature^{21,22}. The same prevents overweight, obesity, helps reduce and control blood pressure levels, cholesterol levels, controls diabetes, improves self-esteem, decreases anxiety and depression, regulates sleep, strengthens the musculoskeletal system, besides inducing cerebral plasticity^{24,25}. Thus, most professionals working in the health area are familiar with these benefits, unlike the lay, who does not always have this knowledge⁴³.

In this study, 44.4% of the participants reported not practicing any type of physical exercise. The percentage of girls who do not practice is 55%, compared to 25% of boys, noting that boys do more physical activity than girls do. In addition, in percentage, a reduction of the practice of physical exercise occurs during high school years.

A study by Hallal et al.⁴⁴, which evaluated physical activity in adolescence and its health benefits showed a prevalence rate of sedentary lifestyle of 58.2%. In the research, the sedentary lifestyle was associated with the female sex, the socioeconomic level, having an inactive mother and the daily time watching television. This research corroborates with this study, and sedentary or physical inactivity rates are very close to those found therein. In our study, we also conclude that the sedentary rate is higher in females. In this aspect, interventions, actions and strategies to combat physical inactivity are necessary, stimulating young people to practice physical exercise and build spaces where it can be performed⁴⁵.

Although 19.2% of the participants in the study use continuous medication, only 3.6% of them use psychotropic drugs. Several studies have demonstrated the occurrence of mental illness in adolescents⁴⁶. The WHO⁴⁷ estimates a

prevalence of 10% to 20%. Netto *et al.*⁴⁸ point out that inappropriate use of psychoactive drugs causes adverse reactions, tolerance and dependence. Thus, it makes the use of these drugs judicious, especially in adolescents who are in a state of deep transformations and constructions of a mature adult brain⁴⁹.

Seeking conservative therapy, or even assisting in drug therapy, it is incumbent upon family members, educators and health professionals to report the benefits of physical exercise to adolescent health⁴⁹.

Araújo *et al.*⁵⁰ demonstrated that physical activity is an adjunct to drug treatment, acting in a positive way on the states of anxiety and depression. Physical exercise promotes adolescent mental health, reducing the need for medications, public health expenditure and the risks of future mental illness⁵⁰.

Thus, this study showed that the adolescents' knowledge about the benefits of physical exercise to mental health can positively influence their healthy habits and lifestyle. Thus, health education is fundamental to providing knowledge and information to young people, and encouraging the practice of physical exercise is essential for mental well-being.

Conclusion

The knowledge of adolescents about the benefits of physical exercise to mental health facilitates and encourages regular practice of physical exercise, regardless of social class. Results suggest that knowledge can be a protective factor against physical sedentarism and physical inactivity.

Collaborations

CG Campos, LA Muniz, VS Belo, MCC Romano and MC Lima contributed to the preparation of the manuscript.

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