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The importance of physical activity in building social bonds and maintaining children's mental health

A importância da atividade física na construção de laços sociais e na manutenção da saúde mental das crianças

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ABSTRACT

Physical activity stimulates children's ability to set goals for themselves; participate in collective activities, discussing rules, values and attitudes related to collaboration, independence, responsibility and respect for individual differences. Our work aimed to identify the main health needs of children related to mental health and sports. The participants of this project include students of the fourth and fifth years of elementary school, teachers and management of the Municipal School Professor Clary Brandão Bertoncini in the municipality of Votuporanga-SP. The educational and sports activities carried out were the identification of each participant

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through the making of a badge, musical chairs, dodgeball, flag pike and object hunting; In addition, BMI was measured in order to classify them according to their nutritional status. In addition, the PAQ-C questionnaire was applied in order to assess the children's sports lifestyle habits. The results showed that the majority of children are underweight in the Body Mass Index classification. The sports preference was running, cycling and futsal and during school recess most students run or play intensely. In addition, it was noted that most have a preference for homemade foods, especially pasta. It was concluded that there is great adherence to sports practice during the school period, in which they have a balanced and healthy diet. It was also observed that those who presented a greater adherence to team sports have an easy time creating social bonds and maintaining physical and mental health.

Keywords: Physical activity, Healthy eating, Children, sports practices, Body mass index.

INTRODUCTION

It is noteworthy that the practice of physical activities provides benefits such as the prevention of obesity, associated with morbidities such as arterial hypertension, dyslipidemia, glucose intolerance, hepatic steatosis, reducing the risks to children of a possible development of heart diseases, diabetes and diseases in the joints and bones. It is also known that it is essential to introduce a balanced diet from 6 months of age, avoiding exposure to ultra-processed and industrialized foods (SOUZA, 2021). The school environment favors healthy eating, and policies for free school meals, monitored by nutritionists, have the role of contributing to positive results in child health, bringing multiple benefits to the development of these students (COHEN, *et al.* 2021). Dietary patterns with low consumption of fish, fruits, and vegetables and high consumption of fast food, sausages, and soft drinks have been related to cognitive problems and poor academic performance (NAVEED, *et al.* 2020). Studies indicate the existence of an important connection between nutritional intake (a whole diet and the availability of micronutrients) and neuro-cognitive development in childhood. Therefore, public health interventions should focus on promoting the overall quality of the diet, providing both micro- and associated macronutrients and not in isolation (NYARADI, *et al.* 2013).

Physical activity favors children's ability to set goals for themselves, participate in group activities, discuss rules, values, and attitudes related to collaboration, independence, responsibility, and respect for individual differences. The period called latency, between the 1st and 4th grades (6 to 10 years), in which they develop skills, values, and understand their role in society. (BENEDICT, METZNER). Physical activity at school can reduce anxiety, increase resilience, improve well-being and mental health. However, due to the great heterogeneity of

schoolchildren, initiatives to increase physical activity should be evaluated with caution (ANDERMO, *et al.* 2020).

Physical, emotional and psychological well-being at all ages and both sexes improves emotional responses to stress, anxiety and substance abuse, reduces mild and moderate levels of depression and anxiety. The regular practice of physical activity is related to the reduction of some neurotic behaviors, expanding creativity and memory, and increasing the ability to concentrate (OLIVEIRA, *et al.* 2011). In addition, it can relieve tension and renew energy, providing pleasure, relaxation and well-being to its practitioners (DA SILVA, *et al.* 2017). A meta-analytical review study indicated that physical exercise can be used as an intervention to improve sleep metrics, immediately seeing a positive impact on healthy individuals (KREDLOW, et al. 2016). Sports activity provides beneficial physical and psychosocial components for adolescent mental health. Studies conducted by Graupensperger et al. (2021) associated sports participation with mental health indices, reducing negative behaviors such as depression, anxiety, hyperactivity, emotional, conduct, and behavioral symptoms throughout adolescence (12 – 17 years). They observed that greater participation in team sports prevented symptoms of depression and anxiety at subsequent times. Participation in sports can make a small but important contribution to adolescents' perceptions of their social abilities and psychosocial well-being (BEDARD, *et al.* 2020), bringing benefits for better personal and social development (OPSTOEL, *et al.* 2019).

At all ages, it is essential to minimize the risk of incubation and early development of chronic degenerative diseases, consequently enabling longevity with a higher quality of life with regard to the factor addressed here (GLANER, *et al.* 2003). It also aids in the release of noradrenaline, which consequently induces the production and release of melatonin, which is a fundamental hormone to induce sleep and reduce metabolic activity. In addition, several changes occur during a night's sleep, such as a decrease in heart rate and body temperature, an increase in hormone synthesis, and increased neurological and physical capacities (CANHIN; JUNIOR, *et al.* 2020). Some sports also favor greater skeletal development, with an increase in bone density and promote a decrease in the total amount of body fat (AGOSTINETE, et al. 2020).

According to the National Food and Nutrition Surveillance System, by mid-September 2022, obesity affected more than 340 thousand children aged 5 to 10 years. Thus, it was necessary to create a qualitative and quantitative analysis project about the benefits of physical activity in childhood.

OBJECTIVES

Identify the main health needs of these children related to mental health and sports.

Clarify the advantages of physical activity for children's growth and development and classify children's nutritional levels (BMI).

Encourage social interaction between students and establish a bond between them.

METHODOLOGY

PARTICIPANTS

Students enrolled in the 4th and 5th year of elementary school I of the Municipal School Professora Clary Brandão Bertoncini were invited, participation was conditioned to the return of the Informed Consent Form signed by the parents or guardians and the Consent Form signed by the students.

MATERIAL OR INSTRUMENTS

Scale, tape measure and calculator.

Questionnaire (CROCKER, 1997 – adapted by DA SILVA, 2019)

LOCATION

Escola Municipal Professora Clary Brandão Bertoncini located at Rua Rio Grande, 1719 – Chácara Paineiras, Votuporanga, São Paulo.

PROCEDURES

Badge making

Cardboard and string were used to make badges, with the objective of identifying and presenting the students, and they were instructed to be filled in with their name, age, favorite color, favorite sport, favorite leisure and favorite food. Subsequently, the badges were shuffled for the children to interact with each other and with the team participants.

Musical chairs

Chairs and a speaker were used to hold a competition among the students for their recreation.

Burning

A ball was used in order to carry out a game, which divides into 2 teams, with the objective of eliminating the opponents by hitting them with the ball.

Pike flag

2 vests were used in opposite locations, in which the objective is to cross the opponent's field and capture the other team's vest without being touched. If the player is caught while trying to grab the vest, they must remain motionless until a player on their team is able to touch it.

Object hunting

A printed sheet with several objects scattered around was used so that the student could find the requested object, while the questionnaire was carried out by the medical students in relation to physical activities.

Body mass index (BMI)

BMI is calculated by dividing weight by height squared. A scale and a tape measure were used. The students were called individually to weigh and measure their height in order to calculate the children's body mass index and compare it with the reference values.

Semi-structured questionnaire

Individual interview directed to students between the age group of 8 and 10 years, based on a PAQ-C questionnaire (Physical Activity Questionnaire for Older Children), applied by the research group. (Appendix 1).

The questionnaire presents items that address the practice of physical activity in the last 7 days. It begins by addressing the weekly frequency of physical activity with 22 types of exercises in free time, with the possibility of adding unplanned activities. The other questions refer to the intensity of the activity during the physical education classes and the time of day they were held (De SENNA, *et al.* 2023).

DATA ANALYSIS PROCEDURE

From the determination of BMI, the students were classified into three groups, according to their nutritional status: eutrophic, overweight and obesity.

According to the nutritional data, the students were evaluated in relation to their physical activity habits, according to the PAQ-C questionnaire. The results obtained were expressed in graphs and tables using the Excel program.

RESULTS

The results are represented by 11 figures, the first of which is related to BMI, the last two are associated with the results obtained by filling out the badge, and figures 2 to 9 were obtained by analyzing the results of the PAQ-C questionnaire. Figures 10 and 11 are representations of the data obtained from the badge made by the students.

Figure 1 represents the classification of the Body Mass Index. Of these, 64.2% are underweight (yellow), 21.4% are slightly overweight (green) and 14.4% are at ideal weight (blue).

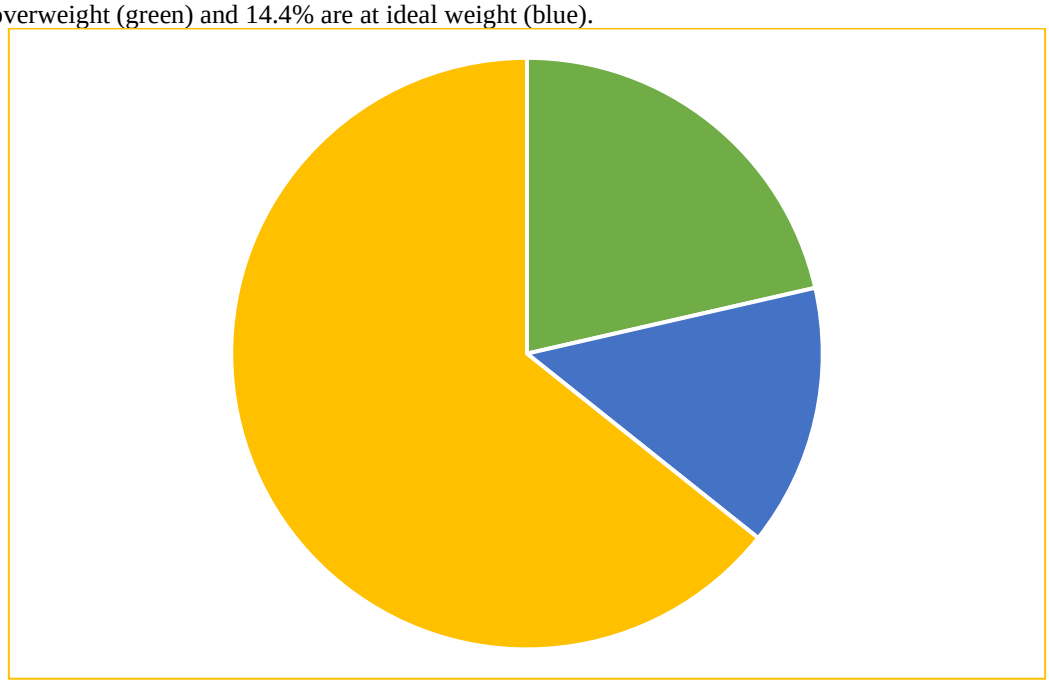
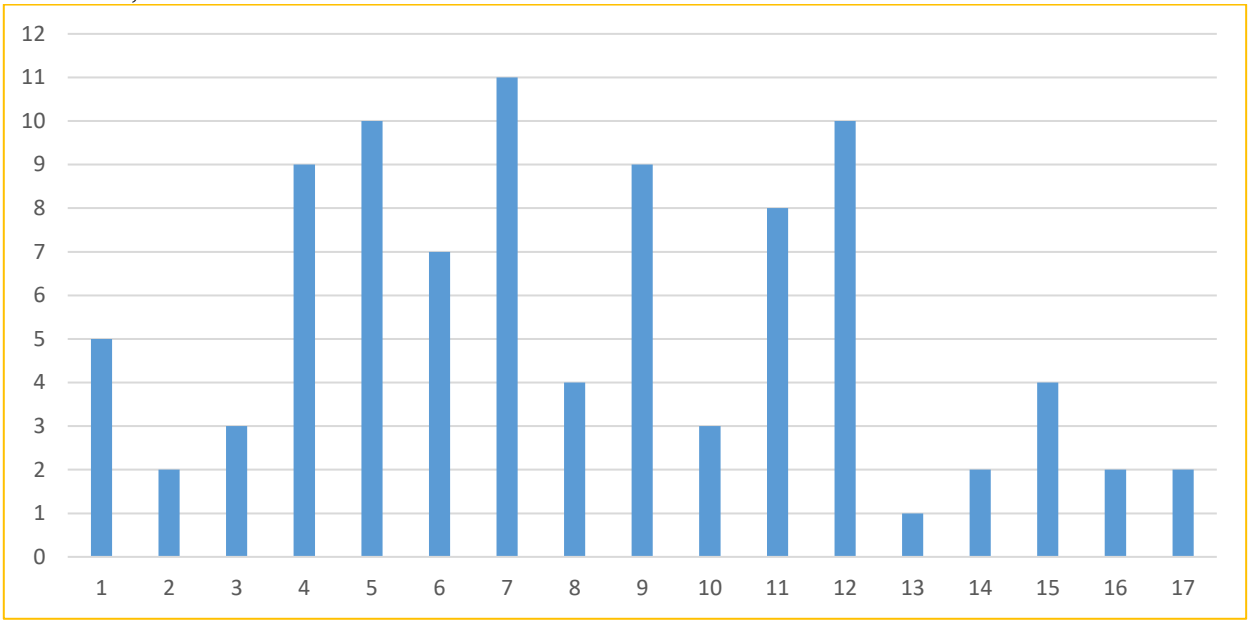
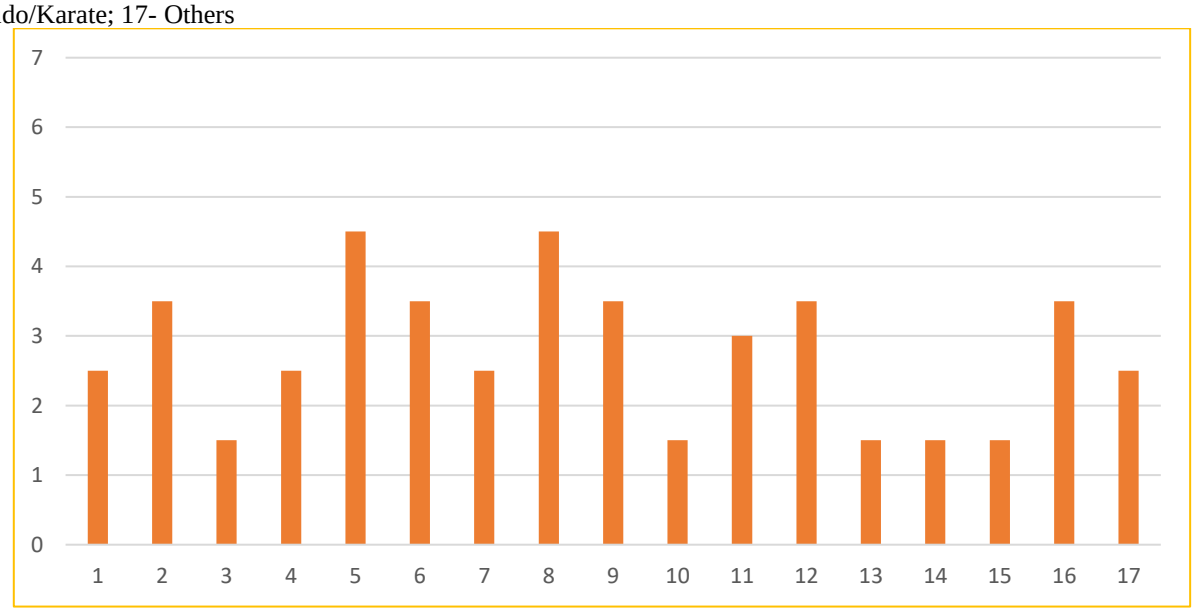


Figure 2 represents the number of practitioners of each sport, verified through the PAQ-C test, where: 1-Jump rope; 2- Rollerblading; 3- Skateboarding; 4- Tag; 5- Bicycle; 6- Walking; 7- Running; 8- Swimming; 9- Dancing; 10- Gymnastics; 11-Basketball; 12- Futsal/Football; 13-Volleyball; 14- Handball; 15- Ping-Pong/Tennis; 16- Judo/Karate; 17- Others



The results showed that the preference was running, cycling and futsal. The least practiced were volleyball, judo and handball.

Figure 3 represents the frequency of sports practiced, verified through the PAQ-C test, where: 1-Jump rope; 2- Rollerblading; 3- Skateboarding; 4- Tag; 5- Bicycle; 6- Walking; 7- Running; 8- Swimming; 9- Dancing; 10- Gymnastics; 11- Basketball; 12- Futsal/Football; 13-Volleyball; 14- Handball; 15- Ping-Pong/Tennis; 16- Judo/Karate; 17- Others



The results showed that swimming and cycling were the most practiced and the least practiced were volleyball, handball, table tennis, gymnastics and skateboarding.

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Figure 4 represents the practice of physical activity outside the class period, verified through the PAQ-C test, where: 1-Not once; 2-Once; 3- 2 to 3 times; 4- 4 to 5 times; 5- 6 or more times. We have observed that during the night there is less practice

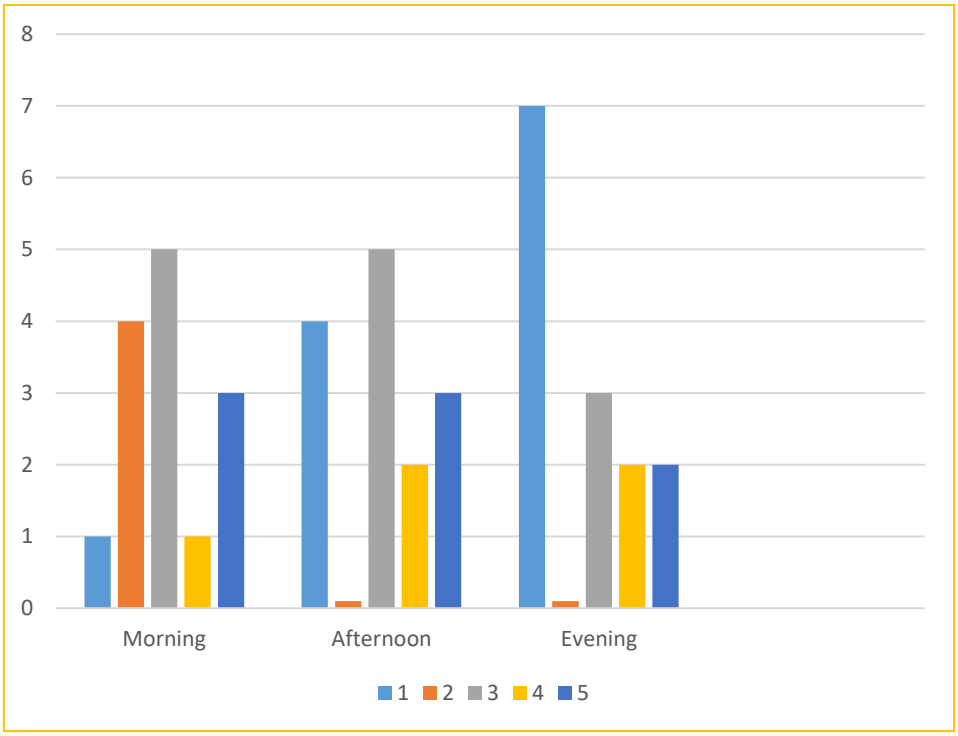


Figure 5 represents the participation of students during physical education classes, verified through the PAQ-C test, with 50% of students participating many times, 43% always participating and the remaining 7% participating a few times.

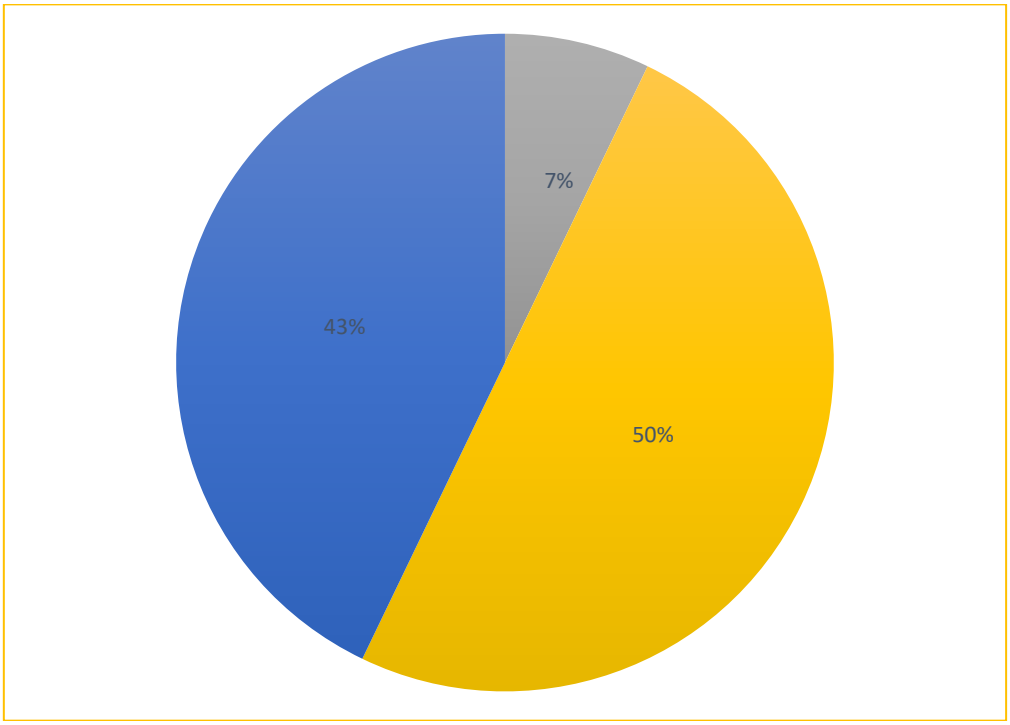


Figure 6 represents the activity performed during school recess, verified through the PAQ-C test, with 43% of the students running and playing intensely, 15% sitting, 14% running and playing a lot, 14% running and playing little, and 14% strolling.

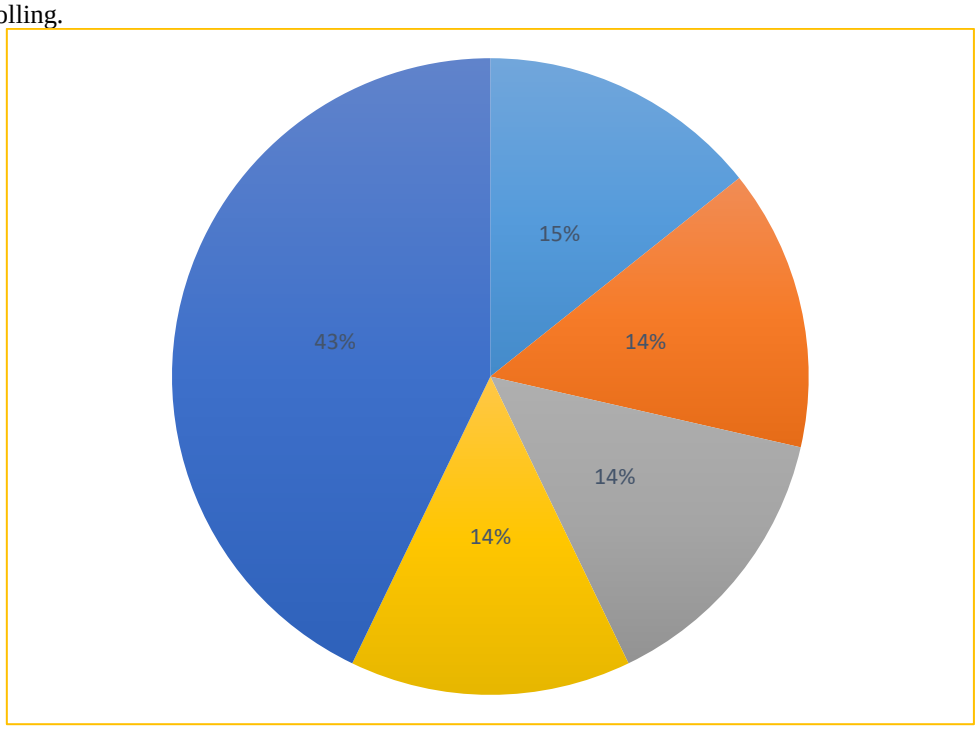


Figure 7 represents the practice of physical activity during the weekends, verified through the PAQ-C test, with 36% practicing two to three times a day, 29% six times or more, 14% only once, 14% not at all and 7% four to five times a day.

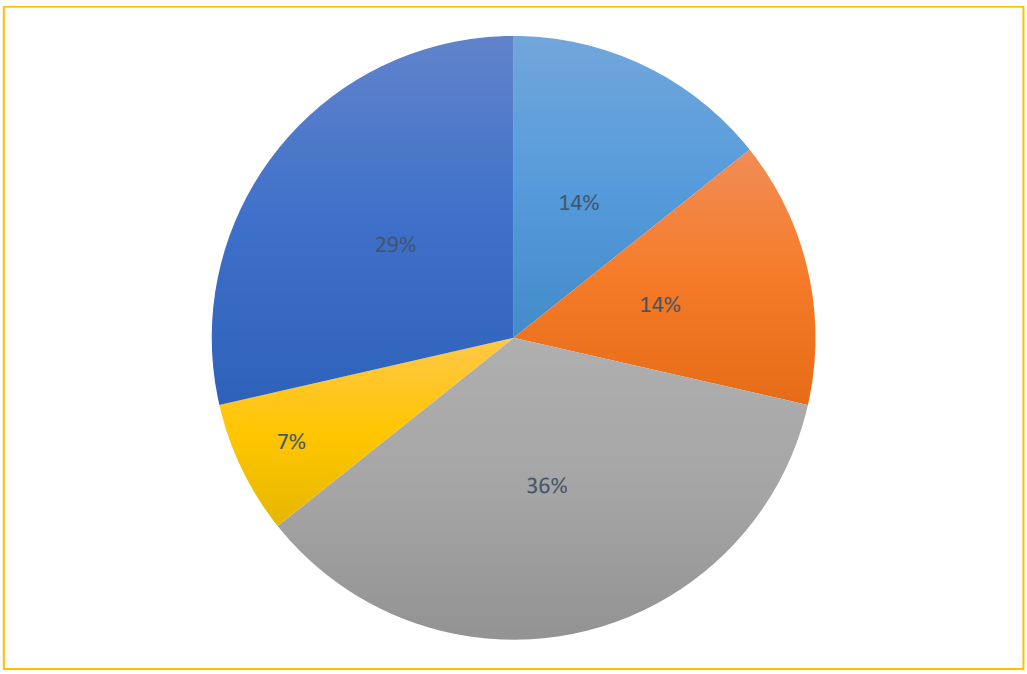


Figure 8 represents the activities performed during the last week, verified through the PAQ-C test, with 57% practicing a few times, 15% very often, 14% very often, 7% little or no time, and 7% practicing frequently.

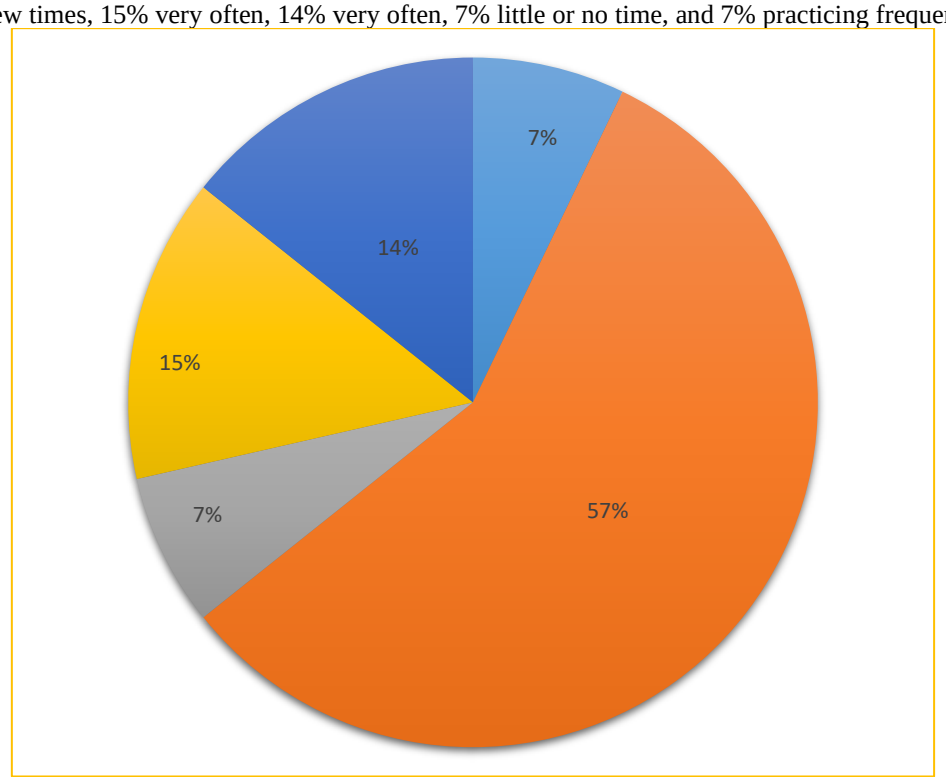


Figure 9 represents the impediment to perform some physical activity in the last week, verified through the PAQ-C test, with 86% not suffering any type of impediment and 14% suffering due to health problems or punishment.

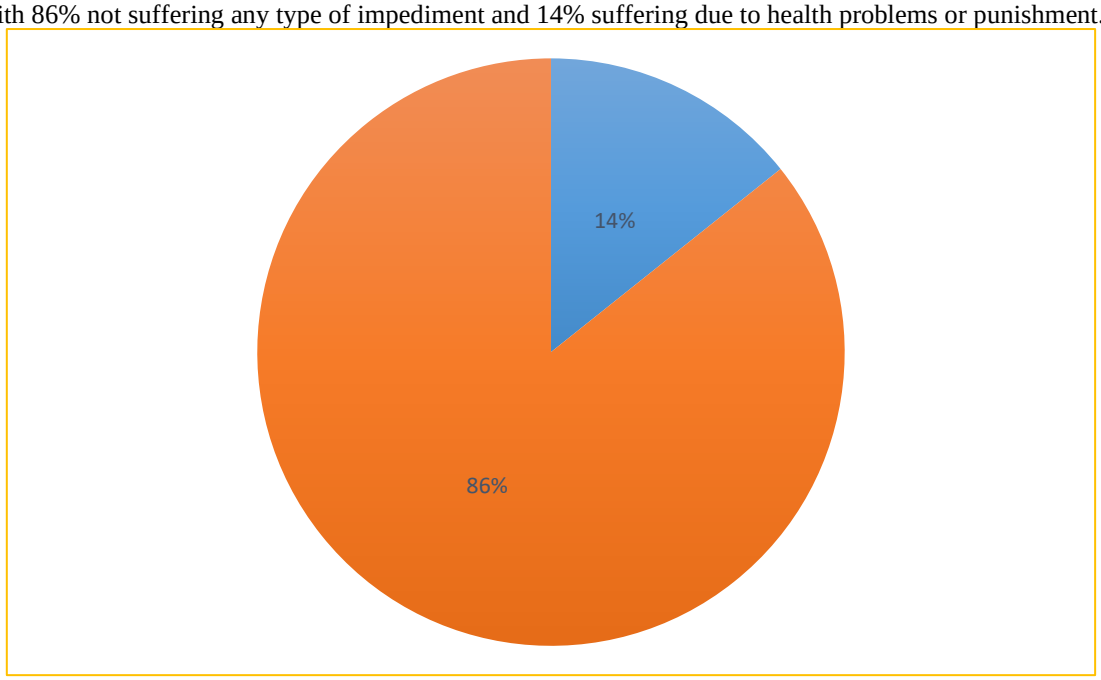


Figure 10 represents the students' preferred food, verified through the badge, where: 1- Noodles; 2- Acai; 3- Noodles; 4- Snack; 5- Pancake; 6- Stroganoffe; 7- Coxinha; 8- Sweet; 9- Feijoada; 10- Lasagna; 11- Barbecue; 12- Japanese food; 13- None; 14- All. The results showed that 24% chose pasta, followed by 12% with ramen noodles and acai berries and 8% with stroganoff and lasagna.

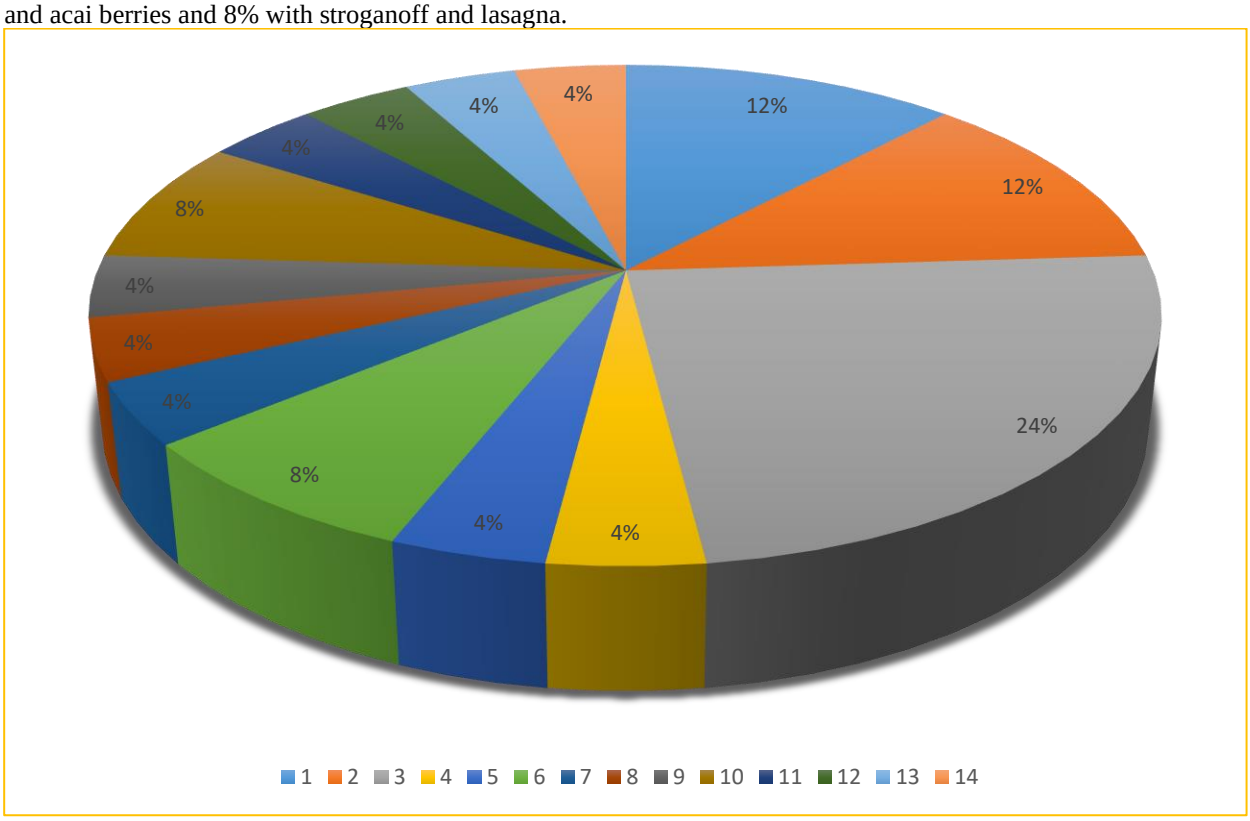
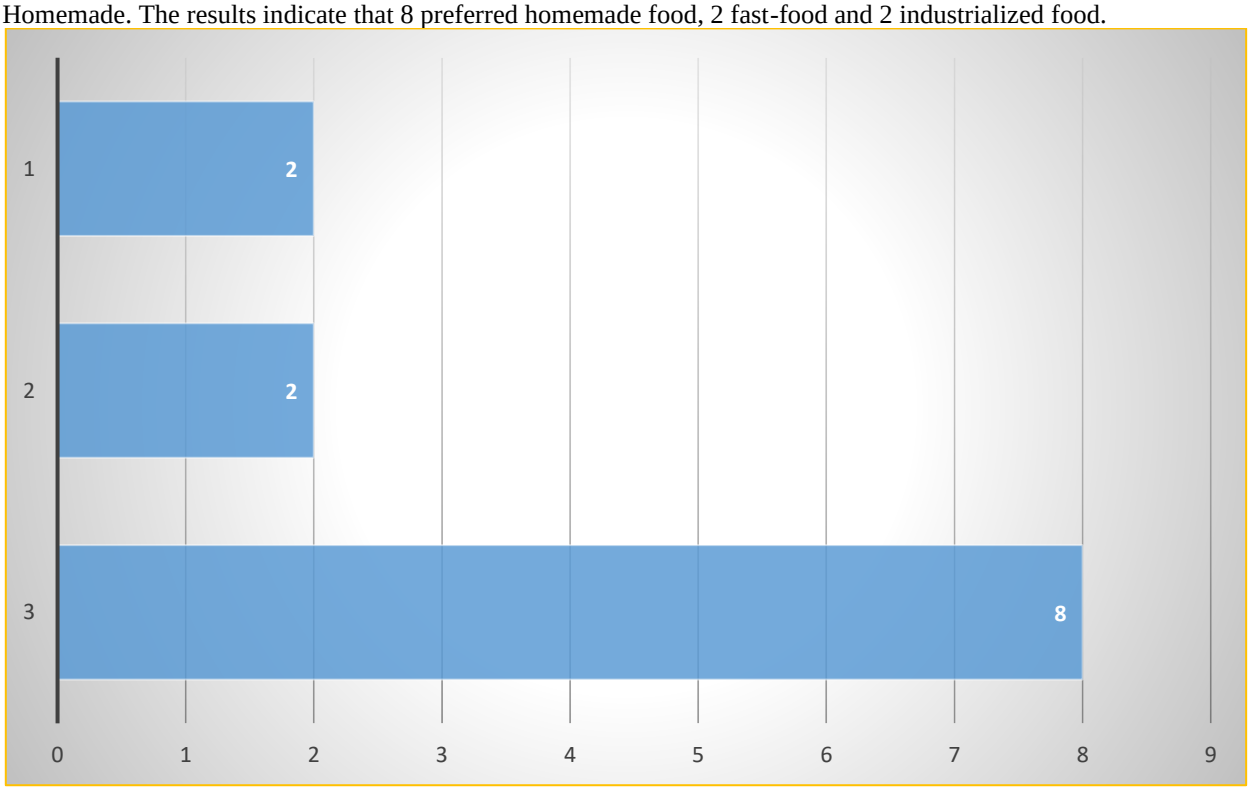


Figure 11 represents the food classification of the students' favorite foods, where: 1- Fast-Food; 2- Industrialized; 3- Homemade. The results indicate that 8 preferred homemade food, 2 fast-food and 2 industrialized food.



DISCUSSION

The improvement in children's health conditions from the maintenance of regular physical activity habits is well founded. Current understanding of the impact of exercise on health outcomes in adults, and the paediatric origins in the natural history of some diseases, provide a rationale for the promotion of exercise during the paediatric years. Therefore, it is necessary to create realistic guidelines for daily activity, defining approaches to limit time in sedentary behaviors (ROWLAND, 2007). In his study, Stuart demonstrated the positive impact of physical activity on brain development, executive function, general well-being, and school readiness observed in the crucial period of early childhood development (STUART, 2021).

School-age youth can derive health benefits from engaging in moderate physical activity over a period of time totaling 60 minutes or more per day. These activities should include aerobic exercise, as well as age-appropriate muscle and bone strengthening (U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, 2018).

Proposed studies for children have shown that physical activity leads to widespread benefits in child development, including improved health, social and emotional development. The optimal amount of time that children should spend physically active varies depending on the outcome of health interest or non-cognitive development. (NGUYEN, *et al.* 2022)

According to the World Health Organization (WHO), the age group that involves children and young people (5 to 17 years old) who practice physical activity regularly show an improvement in health indicators. These benefits include increased cardiorespiratory fitness and muscle strength, reduced body fat, improved cardiovascular condition, and decreased metabolic disease risk profiles, as well as improved bone health and reduced symptoms of depression. (WHO, 2023)

Physical activity for this age group should include play, games, sports, transportation, recreation, physical education, or planned exercise, in the context of family, school, and community activities.

With the aim of improving cardiorespiratory and muscular fitness, bone, cardiovascular and metabolic health biomarkers of health, and reducing symptoms of anxiety and depression, WHO makes the following recommendations:

1. Children and young people should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily.
2. Physical activity of more than 60 minutes daily will provide additional health benefits.

3. Most of the daily physical activity should be aerobic. Vigorous-intensity activities should be incorporated, including those that strengthen muscles and bones, at least 3 times a week (WHO, 2023).

CONCLUSION

It is concluded that there is great adherence to the practice of sports during the school period, however there is a need to encourage the practice of sports outside the school environment. In addition, it was found that within the school environment, children have a balanced and healthy diet, when compared to outside school, represented by the results of the body mass index, which were largely underweight. It was observed that those who presented a greater adhesion to team sports have an easy time creating social bonds. Finally, the maintenance of the physical and mental health of the children who perform sports practices during recreational activities and the making of the badge was noted.

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APPENDIX – PHYSICAL ACTIVITY QUESTIONNAIRE FOR CHILDREN – PAQ-C

Physical Activity Questionnaire for Older Children PAQ-C

1. Physical activity in **free time**: You have done any of these activities in the last 7 days (last week). If the answer is yes, how many times? (Mark a single response per activity).

Physical Activity	**No**	**1-2**	**3-4**	**5-6**	**≥ 7**
Jump rope	( )	( )	( )	( )	( )
Rollerblading	( )	( )	( )	( )	( )
Skate	( )	( )	( )	( )	( )
Play tag Sticks	( )	( )	( )	( )	( )
Andar Bike	( )	( )	( )	( )	( )
Walking as a physical exercise	( )	( )	( )	( )	( )
Run	( )	( )	( )	( )	( )
Swim	( )	( )	( )	( )	( )
Dance	( )	( )	( )	( )	( )
Exercise in gyms of gymnastics	( )	( )	( )	( )	( )
Play basketball	( )	( )	( )	( )	( )
Playing football/futsal	( )	( )	( )	( )	( )
Jogar volleyball	( )	( )	( )	( )	( )
Jogar Handebol	( )	( )	( )	( )	( )
Play Field Tennis/Tennis table	( )	( )	( )	( )	( )
Lutter Jude, Karate, ETC.	( )	( )	( )	( )	( )
Other:	( )	( )	( )	( )	( )
Other:	( )	( )	( )	( )	( )

2. In the last 7 days, during **PE classes**, how many times have you remained very physically active: playing intensely, running, jumping, throwing, etc.?
( ) I don't have a physical education class
( ) Almost never
( ) Sometimes
( ) Often
( ) Always

3. In the last 7 days, what have you typically done during **school recess time**?
( ) I sit (talking, reading, doing classwork, etc.)
( ) I wander around the school grounds
( ) I run or play a little ( ) I run or play a lot
( ) I run or play intensely throughout recess

4. In the last 7 days, outside of school, in **the mornings**, how many times have you played, played sports, exercised or danced in such a way that you were very physically active?
( ) Not once
( ) Once in the last week
( ) 2 – 3 times in the last week
( ) 4 – 5 times in the last week
( ) 6 or more times in the last week

5. In the last 7 days, out of school, in **the afternoon**, how many times have you played, played sports, exercised or danced in such a way that you were very physically active?
( ) Not once
( ) Once in the last week
( ) 2 – 3 times in the last week
( ) 4 – 5 times in the last week
( ) 6 or more times in the last week

6. In the last 7 days, outside of school, in **the evenings**, how many times have you played, played sports, exercised or danced in such a way that you were very physically active?
( ) Not once
( ) Once in the last week
( ) 2 – 3 times in the last week
( ) 4 – 5 times in the last week
( ) 6 or more times in the last week

7. In the last **weekend**, how many times have you played, played sports, exercised or danced in such a way that you were very physically active?
( ) Not once
( ) Once
( ) 2 – 3 times
( ) 4 – 5 times
( ) 6 or more times

8. Which of the following best describes your **last 7 days**? Read through the 5 options before settling on an answer that best describes your last week.
( ) All or most of my free time did activities that require little or no physical effort.
( ) A few times (1-2 times in the last week) I did physical activity in my free time (e.g., I played sports, played ball, ran, swam, danced, cycled, exercised, etc.)
( ) Frequently (3-4 times in the last week) I performed physical activity in my free time
( ) Quite often (5-6 times in the last week) I performed physical activity in my free time
( ) Very often (7 or more times in the last week) I performed physical activity in my free time

9. Mark how often you did physical activity (e.g., played sports, played ball, ran, swam, danced, cycled, exercised, etc.) on each day of the week.

Activities	**No**	**Little**	**Medium**	**Pretty much**	**Very much**
Monday	( )	( )	( )	( )	( )
Tuesday	( )	( )	( )	( )	( )
Wednesday	( )	( )	( )	( )	( )
5th Fair	( )	( )	( )	( )	( )
Friday	( )	( )	( )	( )	( )
Saturday	( )	( )	( )	( )	( )
Sunday	( )	( )	( )	( )	( )

10. Have you been sick in the last week, or have you had any situation that prevented you from performing physical activity normally?
( ) No ( ) Yes What was the impediment?