



ACTIVIDAD FÍSICA Y DESARROLLO COGNITIVO EN LOS ESTUDIANTES DE BACHILLERATO

Resumen

El trabajo de investigación tiene como propósito establecer la importancia de la actividad física para mejorar el desarrollo cognitivo en la asignatura de Educación Física con los estudiantes de segundo de bachillerato, estuvo orientado en la utilización de una metodología de enseñanza activa. La investigación tuvo un enfoque cuantitativo, de tipo cuasi experimental, de alcance descriptivo y correlacional, tuvo como meta realizar comparaciones estadísticas de la relación de las variables de estudio entre los grupos de control y experimental; la intervención fue llevada a cabo con el grupo de estudio o experimental conformado por 54 estudiantes que integran los paralelos A y B correspondientes a segundo de bachillerato; la técnica utilizada fue la encuesta y el cuestionario fue su instrumento, integrado por un total de 25 preguntas dividido en dos secciones; al realizar las comparaciones la mediana aritmética del grupo experimental en el postest alcanzó 7,76 y en el grupo control 5,87; lo que significa, que luego de aplicar 3 talleres y 8 actividades físicas, luego de 8 semanas de intervención únicamente con los estudiantes del grupo experimental, la aplicación de la propuesta dio excelentes resultados y logró un cumplimiento de cabal del objetivo de la investigación; para comprobar este resultado, finalmente fue aplicada una encuesta de satisfacción a los estudiantes del grupo experimental, dicho de otro modo, tuvo un impacto positivo en el desarrollo cognitivo los estudiantes.

Palabras clave: actividad física, desarrollo cognitivo, educación física.

PHYSICAL ACTIVITY AND COGNITIVE DEVELOPMENT IN HIGH SCHOOL STUDENTS

Abstract

The purpose of the research work is to establish the importance of physical activity to improve cognitive development in the subject of Physical Education with second-year high school students, it was oriented towards the use of an active teaching methodology. The research had a quantitative approach, of a quasi-experimental type, with a descriptive and correlational scope, with the goal of making statistical comparisons of the relationship of the study variables between the control and experimental groups; The intervention was carried out with the study or experimental group made up of 54 students who make up parallels A and B corresponding to the second year of high school; the technique used was the survey and the questionnaire was its instrument, made up of a total of 25 questions divided into two sections; When making the comparisons, the arithmetic median of the experimental group in the post-test reached 7.76 and in the control group 5.87; which means that after applying 3 workshops and 8 physical activities, after 8 weeks of intervention only with the students of the experimental group, the application of the proposal gave excellent results and achieved full compliance with the research objective; To verify this result, a satisfaction survey was



finally applied to the students of the experimental group, in other words, it had a positive impact on the cognitive development of the students.

Key words: physical activity, cognitive development, physical education.

ATIVIDADE FÍSICA E DESENVOLVIMENTO COGNITIVO EM ALUNOS DO ENSINO MÉDIO

Resumo

O objetivo do trabalho de pesquisa é estabelecer a importância da atividade física para melhorar o desenvolvimento cognitivo na disciplina de Educação Física com alunos do segundo ano do ensino médio, foi orientado para o uso de uma metodologia de ensino ativa. A investigação teve uma abordagem quantitativa, de tipo quase-experimental, de âmbito descritivo e correlacional, teve como objetivo fazer comparações estatísticas da relação das variáveis de estudo entre os grupos de controle e experimental; A intervenção foi realizada com o grupo de estudo ou experimental formado por 54 alunos que compõem os paralelos A e B correspondentes ao segundo ano do ensino médio; a técnica utilizada foi a enquete e o questionário como instrumento, composto por um total de 25 questões divididas em duas seções; ao fazer as comparações, a mediana aritmética do grupo experimental no pós-teste atingiu 7,76 e do grupo controle 5,87; ou seja, após a aplicação de 3 oficinas e 8 atividades físicas, após 8 semanas de intervenção apenas com os alunos do grupo experimental, a aplicação da proposta deu excelentes resultados e atendeu plenamente ao objetivo da pesquisa; Para verificar esse resultado, por fim, foi aplicada uma pesquisa de satisfação aos alunos do grupo experimental, ou seja, teve um impacto positivo no desenvolvimento cognitivo dos alunos.

Palavras-chave: atividade física, desenvolvimento cognitivo, educação física.

Introduction

In physical education classes, physical activity is an ideal space to promote good practices conducive to improving the physical and mental health of children and youth, this research aims to understand its various benefits for students. Two experiences of physical activity and cognitive development that have been studied over the last five years are presented below.

Physical activity according to Sanchez (*et al.* 2019) has been successfully used to prevent and treat obesity, hypertension, and other chronic diseases. Similarly, a sedentary lifestyle is associated with morbidity and mortality, including hypertension, diabetes, and coronary heart disease at a very young age. Research on the benefits of childhood physical activity has increased significantly in recent years and, although there are risks associated with exercise, all scientific reviews, guidelines, and organizations agree that the benefits far outweigh the risks.

Therefore, the current generation lives with the power of technology and is immersed in a sedentary lifestyle without physical effort, so it should be assumed that physical activity



and exercise, applied in a reasonable and controlled manner, promote health, success and interest in school attendance.

For his part, Quílez (2020) considers that physical activity is currently very valuable for people, and several studies have confirmed the effects of physical activity in improving the physical condition and school performance of young people, since it is an important part of the overall biopsychosocial development of young people. It is also a widely accepted idea that exercise improves the overall quality of life, by improving their health they have a versatile education that will also serve them in the future. Regular exercise makes the student to relieve stress and get better benefits in teaching and learning.

Nowadays it is of great value that an individual engages in physical activity, several studies have proven the effects of exercise in young people in improving their physical condition and school performance, this is a vital part in terms of the biopsychosocial development of the student in adolescent stage. Similarly, the idea that exercise increases the quality of life is widely accepted, improves your health, provides a comprehensive education that will serve you in the future. Exercise frequently practiced makes the student to release their stress, get a better benefit in teaching and learning.

In this vein, Rodríguez (*et al.* 2020) argue that numerous observational studies and a small number of experimental studies show that regular physical activity is valuable in providing health benefits for children and adolescents. Recent large-scale epidemiological studies using valid measures of physical activity have shown stronger associations that have helped to clarify the dose-response relationship between physical activity and certain health outcomes that go beyond improving academic performance and classroom performance.

All the benefits of an active life are especially significant after puberty. It is no secret that physical activity is a great benefit for people. According to Bastis (2019) it improves their physical condition and helps to maintain a more positive attitude to life. This has a positive effect on academic performance. Thus, people are in an excellent physical and mental attitude to perform a lot of academic work. For this reason, it is recommended that students engage in physical exercise or practice a specific sport. Exercising a healthy physical activity will give you a better inclination and make you feel more relaxed and confident in your abilities.

The problematic situation of educational institutions at the national level arises from the fact that educational programs with complementary content related to cognitive development through the field of Physical Culture are not presented. According to Romero (2016) it is important to mention that teachers and professionals from other academic fields indicate that the development of cognitive and physical skills occurs throughout the year, which is not recorded in the planning and its approach in the educational field is limited.

Regarding obesity, according to Fernández (*et al.* 2017) it is predicted that in 2025 there will be more than 700 million obese people in the world. It has been estimated that obese people incur 25% more healthcare costs than a person without this pathology. As for cognitive development, it is directed to the level of knowledge demonstrated by the field or subject compared to age level and academic level. More time spent on types of exercise does not negatively affect the academic performance of high school students; participation in a functional exercise program, had significant positive effects on academic performance, another study by Berdegué (2019) found that aerobic exercise is positively associated with cognitive function in young people.



A related affective and evaluative component is self-esteem, which is the degree of personal satisfaction of an individual. Self-esteem would be limited by how a person views himself or herself, and how he or she values and appreciates what he or she perceives. In this case, the research focuses on the role of physical activity in students and how it helps develop children's cognitive abilities in their academic training process. For Vergara (2019) exercise is often associated with health benefits, but there is evidence that exercise improves cognitive functioning through healthy exercise habits, study spaces and rest, therefore, in academic performance. It also improves the well-being of people with mental health problems such as stress, depression, or anxiety.

Physical activity also helps socially, to develop self-esteem and self-image, especially for students who are still developing. Another reason that prevents young people from exercising is lack of time and motivation, because adults do not receive the guidance, they need to choose a sport, because they are prone to feel embarrassment, incompetence or simply do not know what benefits this brings to their integrated development and better quality of life.

Also, it is important to note that exercise is historically and widely recognized as one of the most effective ways to lead people to a better quality of life, so it is understood as one of the basic rights of all people. The opposite of physical activity is increased inactivity or a sedentary lifestyle. Moreover, the mere absence of disease, state of health or good health gives all individuals the opportunity to enjoy life and face daily challenges. In contrast, poor health is associated with an increased likelihood of illness, serious complications and, ultimately, premature death.

In Ecuador all educational institutions have within their curriculum the subject of physical education which is mandatory from kindergarten to high school, however, there are no adequate teaching materials for the comprehensive development of this subject, nor do we have the ideal space to develop practical classes and sports, Finally, there is a lack of trained and qualified teaching staff to carry out the activity in question, in many educational institutions in the country, it is the grade teachers who carry out the physical activity of students, with a very good will but lacking the technical and tactical knowledge to encourage young people in the cognitive development from physical education. Unfortunately, what many grade teachers do with students during physical education hours is to play soccer or make them run, without the respective calisthenics or developing the minimum knowledge for young people to understand that physical development contributes to academic performance in their integral formation.

Methodology

This study has a quantitative approach, its results are numerically measurable, and the implementation of the proposal seeks to confirm the hypothesis that: physical activity affects cognitive development in high school students of the Aníbal Salgado Ruiz Educational Unit. Quantitative studies provide an explanation for social reality, are based on the precision of their measurements to generalize the results to populations or broader contexts, are based on sequential order, and consider data collection as essential. This study has a determined scope of correlation between two or more concepts such as physical activity as such,



cognitive development, health, diet, rest, which are categories or variables in the sample or determined context (HERNÁNDEZ, *et al.* 2014).

The investigation followed the development of three stages, at first a diagnostic evaluation was carried out, to verify the existence of the problem that was the subject of the study, then the intervention was carried out, with the development of actions tending to overcome the problems found in the diagnosis. and finally, a post test evaluation, to verify the changes produced in the intervention. So, the three stages executed were diagnosis, intervention, and results, in which the respective analyzes proceeded.

The universe is made up of 1100 students throughout the educational institution, of which the population is 117 students who are in the second year of the unified general baccalaureate made up of men and women between 15-17 years of age, who have a well-formed criterion and are able to answer a questionnaire. A statistical formula was applied to this population to extract the respective sample, so that the data collection work was a little easier in each classroom of the educational institution.

The calculation of the sample was carried out with the purpose of having a more manageable number of students, which led to the obtaining of significant results and more representative. According to the result obtained from the previous calculation, the student sample is made up of 90 students from the A, B and C parallel second baccalaureate of the Aníbal Salgado Ruiz Educational Unit, which correspond to the level at which the researcher normally intervenes as a teacher.

The sample of 90 students is representative, made up of 26 students from parallel A, 28 students from parallel B who constitute the experimental group and 36 students from parallel C as a control group, it is adequately adapted to the research needs, since they use to analyze the problem in order to understand the needs that they take into account to develop a normal development in the performance of daily activities.

The collection of information used the survey as a technique, at the same time, the structured questionnaire was the instrument, because it brings together several standardized procedures to generate a series of data from the sample established to detail its specifications. This technique meets essential requirements for analysis such as: reliability by collecting data with coherence and consistency, validity by providing the accuracy of the measurement of the variables, and finally objectivity by revealing the reality of the research phenomena.

The observation instrument on cognitive development was applied with security measures and with the express permission of the institution and its authorities. This way of participating makes it possible to observe the participants in a systematic way, in this sense, the researcher focused his attention on the situations in ten essential items. The technique allowed observing aspects such as: visual perception, selective observation, fluidity of ideas, formulation of criteria, as well as objective attitudes and behaviors. The observation form was printed one by each student directly to record a personal assessment and then tabulate it.

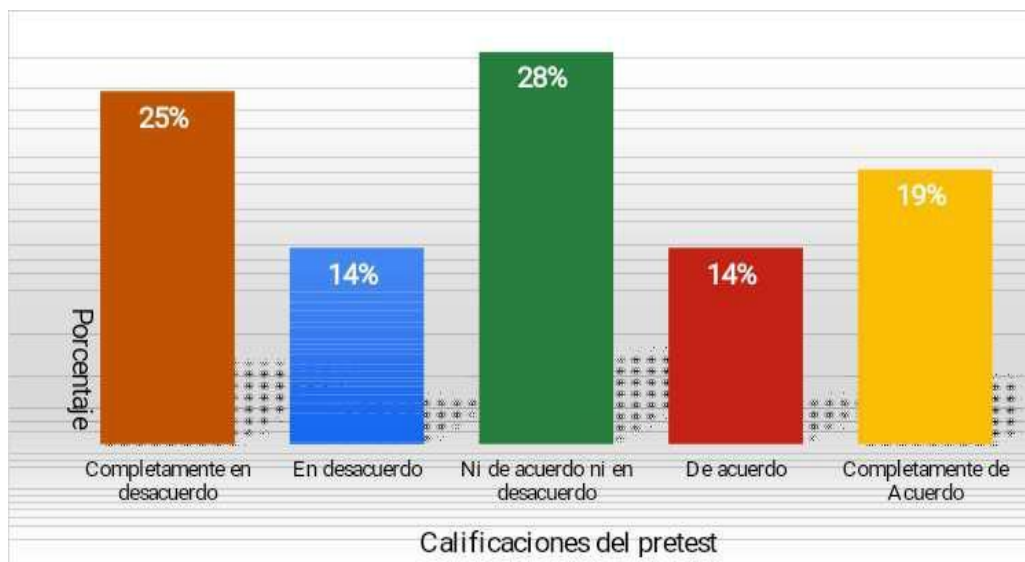
The intervention proposal was carried out with the students called the experimental group, where the first step was to develop a didactic guide with several activities and workshops with various topics that integrate the analysis variables, where the steps to carry out the activities, socialize each lesson, explain pre-lesson tasks, and perform the physical exercises.



The implementation of the work proposal was carried out in four stages: a diagnostic evaluation or pre-test, the execution of the intervention for eight weeks, a post-test evaluation with the comparison with the cognitive development and a satisfaction evaluation to identify the degree of acceptance of the teaching-learning method in the subject of Physical Education and a combination of educational resources and digital tools that facilitated learning in pandemic and post-pandemic scenarios.

Results

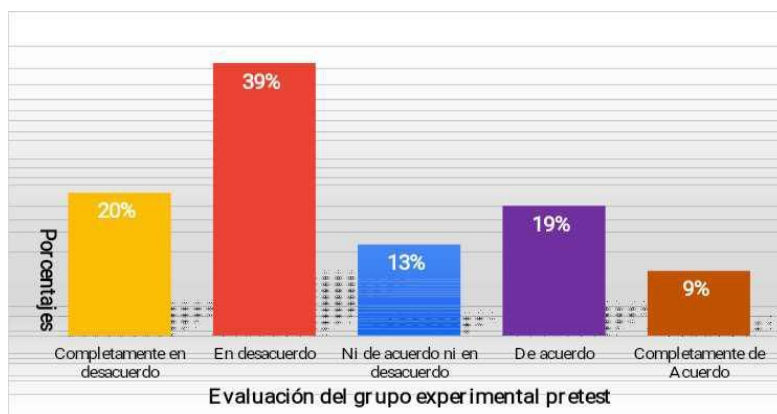
Once the preliminary evaluation is applied, the data is obtained to determine the values corresponding to the pretest of the three parallels that make up the observation units within the investigation to 90 second-year high school students, from this qualification the control group made up of 36 students from parallel C and the experimental group with 26 students belonging to parallel A and 28 students from parallel B.



Evaluation of cognitive development in pretest of the control group
Font: Authors, SPSS program.

The scores achieved in the control group during the physical activity pretest, in which high school students from parallel C, 25% completely disagree with 9 students on scale 1, 14% disagree with 5 students on the scale 2, while 28% neither disagree nor agree with 10 students on scale 3, only 14% with 5 students agree on scale 4 and 19% with 7 students completely agree on scale 5. Which means that most students disagree with their current frequent practice of physical activities.

For his part, Quílez (2020) considers that, currently, physical activity is of great value for people and various studies have confirmed the effects of physical activity in adolescents to improve physical fitness and school performance, since it is a vital part of a young person's overall biopsychosocial development.

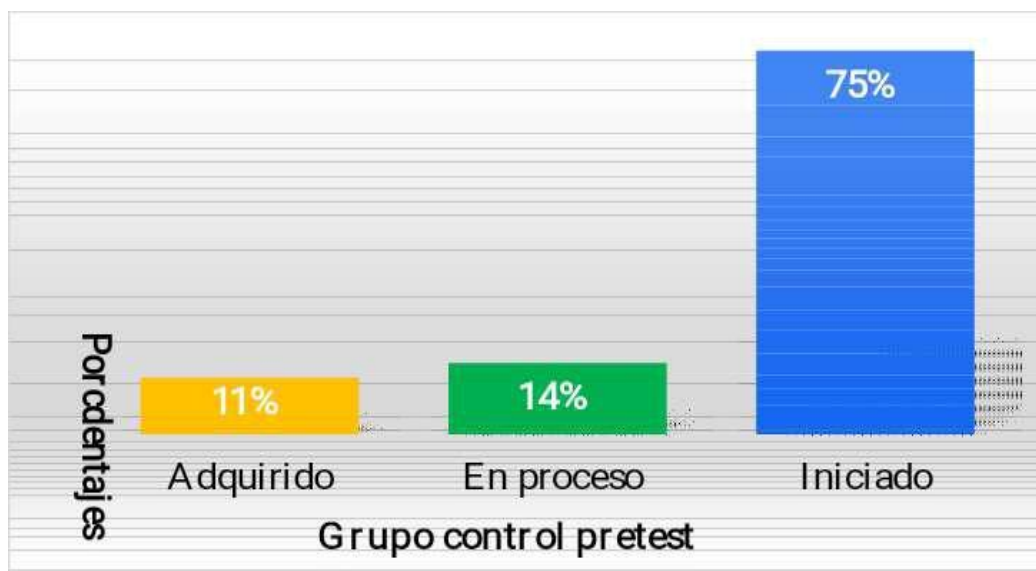


Evaluation of physical activity to pretest students of the experimental group
Font: Authors, SPSS program

The score obtained in the experimental group during the pre-test evaluation, where the students of parallels A and B obtain data that mostly tend to total disagreement, compared to a small group to agree, which corresponds to high school, the 20% completely disagree with 11 students on scale 1, 39% disagree with 21 students on scale 2, while 13% neither disagree nor agree with 7 students on scale 3, only 19% with 10 students agree on scale 4 and 9% with 5 students fully agree on scale 5.

For this reason, Rodríguez (*et al.* 2020), state that numerous observational studies and a small number of experimental studies show that regular physical activity is valuable in providing health benefits for children and adolescents. Recent large-scale epidemiological studies using measures.

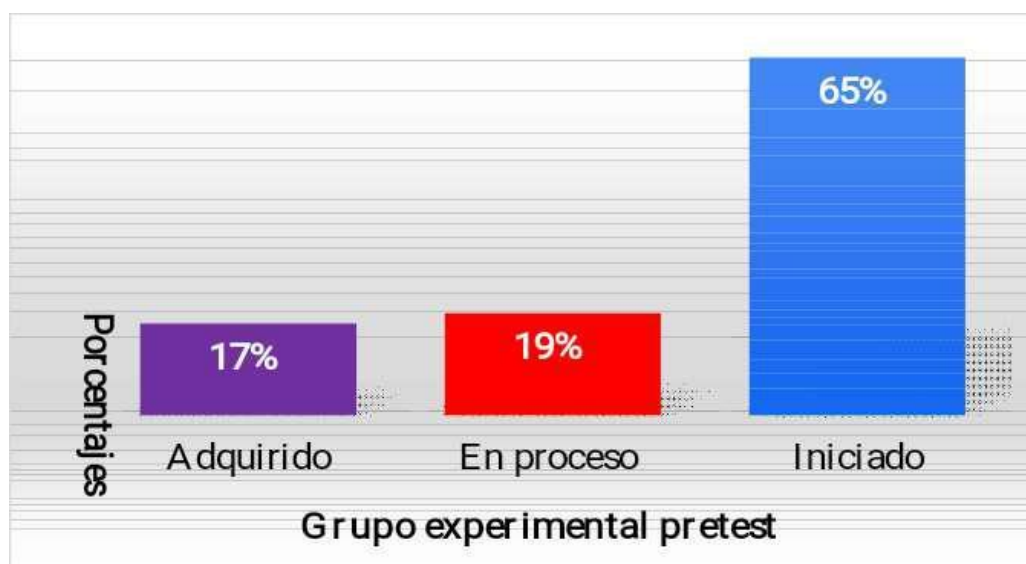
Valid studies of physical activity have shown stronger associations that have helped clarify the dose-response relationship between physical activity and certain health effects that go beyond academic performance in terms of increased classroom performance.



Evaluation of cognitive development to pretest students in the control group.
Font: Authors, SPSS program



The scores achieved in the control group during the physical activity pretest, in which high school students from parallel C, 11% achieve an assessment of acquired with 4 students on scale 1, 14% in process with 5 students on scale 2, while 75% started with 27 students on scale 3. Which means that most students are started with their current level of cognitive development.



Evaluation of cognitive development to pretest students in the experimental group.

Font: Authors, SPSS program

The score obtained in the experimental group during the pretest evaluation, where the students of parallels A and B obtain data that tends mostly to the total initiate, compared to a small group in acquired, which corresponds to high school, 17% in acquired with 9 students on scale 1, 19% in process with 10 students on scale 2, while 75% started with 35 students on scale 3. This means that most students admit that they are in disagreement with the frequent physical activities nowadays.

Likewise, Yáñez (*et al.* 2016), consider that physical activity not only seems to be associated with better physical health, but also confirms the impact of an active lifestyle on people's mental and emotional well-being. Considering the many health benefits, children and adolescents get at least 60 minutes of moderate to vigorous physical activity a day, at least 5 days a week and preferably every day. A sedentary lifestyle causes about 5.3 million deaths per year, which is even more than tobacco-related deaths, which are about 5.1 million deaths per year.

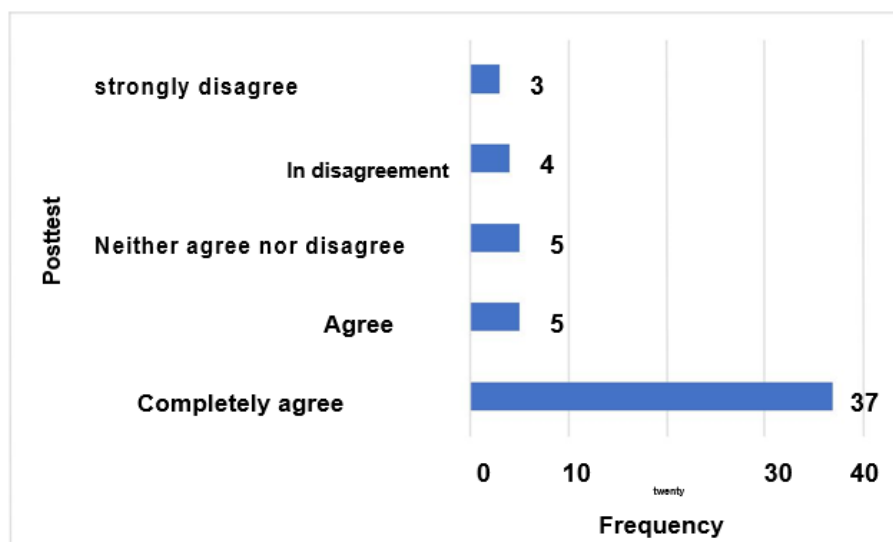
In the second phase of the proposal, an educational intervention began that was socialized to the second-year high school students to work for eight consecutive weeks and was explained during the implementation of the proposal by enabling a team of WhatsApp to address various concerns about the implementation of training activities on issues concerning the study variables. It is important to mention that it was explained to the students how to distribute the work schedule for the implementation of physical activities.



In the third phase, during week nine, the researcher carried out an evaluation based on a post-test in the experimental and control groups to compare the results obtained in the experimental group in which the educational intervention was applied with the learning classroom in the modality face-to-face, with the presentation of workshops and practical activities for high school students and in the same way, with the control group, continued with the traditional teaching method.

The workshops and activities for the intervention were organized in a schedule with a period of 8 weeks, for the modality of face-to-face studies in the facilities of the Aníbal Salgado Ruiz Unidad Educativa, this information is condensed in lesson plans, based on what the curriculum for Sierra and Amazonia determines.

The intervention proposal was developed with the presentation of workshops and physical activities, which were previously mentioned in the development of this work, this stage was carried out in person in the classroom and contributed to each stage of the learning process, which includes the teaching methodology, the results obtained from this group are detailed below.



Post-test experimental group physical activity results

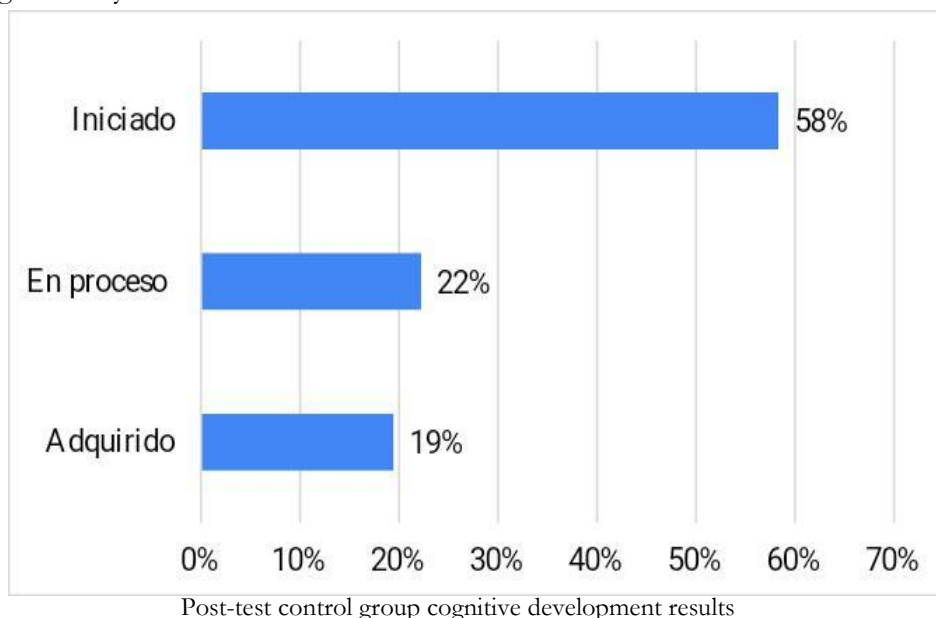
In the results of the application of the questionnaire to the high school students of the experimental group, which in the pretest reached a score of 2 on the quantitative scale, while the qualitative value corresponded to disagreement. This led to proposing intervention initiatives exposed through workshops and practical physical activities aimed at consistent, for example, in classifying words while they touch the ball, naming provinces of Ecuador while receiving the ball, among others, aimed at improving their cognitive development, which determined that the expected results were achieved with satisfaction.

However, in the post-test a considerable improvement occurs, this occurs after the intervention, so that it was called post-test, the data presented are clearly superior and it is possible to appreciate a considerable improvement, with respect to the activity's physics with influence on cognitive development whose value on the quantitative scale is located at 5, which corresponds to totally agree within the qualitative scale.



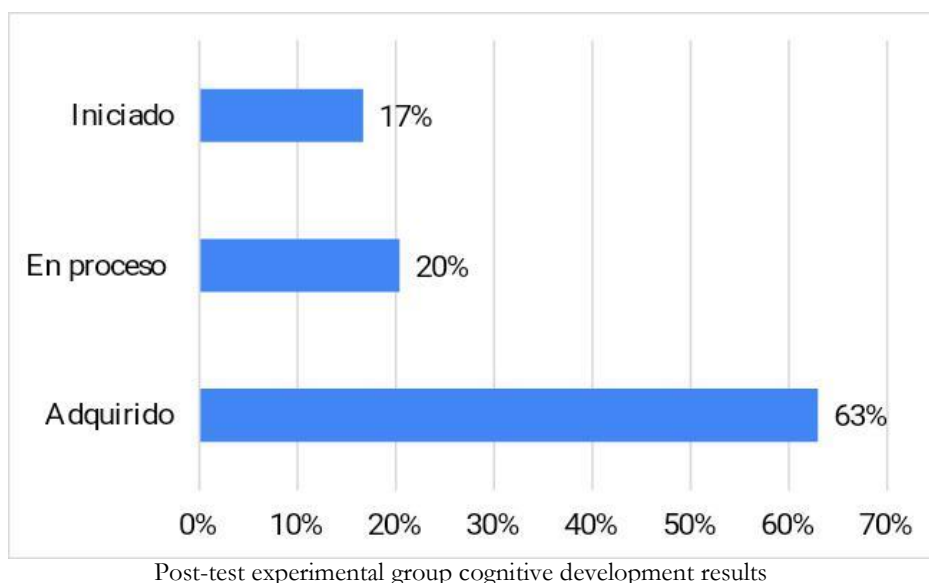
The 37 students agree with the importance of physical activities on the qualitative scale corresponds to Completely agree with 69%, 5 students agree with 9%, 5 students neither agree nor disagree with 9%, 4 students disagree with 7%, while 3 students strongly disagree with 6%. The last three evaluation levels, added together, barely add up to 12 students, which corresponds to a small sample group of 54 students, which implies that most of them improved according to the post-test results.

Physical activity and a sedentary lifestyle are independently related to human health, mainly due to direct physiological effects and the fact that one behavior requires the displacement of another. This idea is expanded by Leiva (*et al.* 2017), who state that although it has been hypothesized that a sedentary lifestyle and obesity is mainly related to the excessive consumption of calories and unhealthy foods such as saturated fats and sugars, studies reveal that people with a of prolonged sedentary life do not have a pattern, the diet differs significantly from those with little session.



The results of the control group are exposed during the post-test that continued with the traditional teaching methodology for a period of eight weeks, in said evaluation it is possible to observe a slight progress in their cognitive development in the practice of activities with 75% corresponding to 27 people, who are located on the qualitative scale of acquired, it should be noted that in the subsequent evaluation the learning phases were respected at each level.

In this regard, Ruiz (2018) suggests that physical activity protects against cognitive deterioration and decreased cognitive aspect by reducing a variety of cardiovascular risk factors such as hypertension, diabetes, hypercholesterolemia, and obesity, which are related with its wear. In any case, most epidemiological studies report a protective effect after adaptation to these cardiovascular risk factors, suggesting that physical activity plays an independent prophylactic role.



The results of the application of the observation of cognitive development to the high school students of the experimental group are detailed, which in the pretest reached a score of 4 on the quantitative scale, while the qualitative value corresponded to acquired. This led to the intervention through workshops on cognitive development, physical activity, healthy eating and physical activities of passes, reception, shooting with the ball and others, as practices aimed at improving their cognitive development, this determined that the results were achieved. with satisfaction.

However, in the post-test a considerable improvement occurs, this occurs after the intervention, so that it was called post-test, the data presented are clearly higher and it is possible to appreciate a considerable improvement, with respect to physical activities with an influence on cognitive development whose value on the quantitative scale is located at 4, which corresponds to acquire within the qualitative scale. The same graph 9 reveals that 34 students agree with the importance of physical activities on the qualitative scale corresponds to acquired with 63%, 11 students in process with 20%, 9 students in the beginning with 17%.

It has been suggested that for some time physical activity is associated with a considerable improvement in brain-derived cognitive processes, but Suárez and Costo (2019) mention that studies from the University of Illinois in the United States ended this assumption with the Empirical confirmation that the greater the aerobic activity, the less neuron in the process of degeneration. In this way, it was found that physical activity has a positive effect on cognitive control in general, although the results differ in terms of academic performance, where, given the study under review, there seems to be a weak correlation.

Discussion

The benefits of physical activity for children and adolescents have been widely demonstrated. According to RELOBAA (*et al.* 2016):



Exercise is currently the basis of the educational process of schoolchildren, both in the development of social and individual values and in the promotion of healthy habits that address current public health issues in childhood and adolescence, with habits and obesity derived from a sedentary life (p. 5).

Jiménez (2017) rather demonstrated that parents have a lot of misinformation about the way they feed their children, which affects their emotional, physical, and mental development. Referring to the subject, Relobaa (*et al.* 2016) analyzed the effects of exercise on the cognitive processes of the child and the most appropriate exercise models to achieve it. The results reveal that physical activity has a positive effect on the cognitive processes of the student, although it does not seem to be felt in their academic performance at short term.

According to Campo (2019), an area of cognitive development is understood to be one that:

Understands physical knowledge in terms of knowing the physical properties of objects and how to act on them (actively explores with all the senses; manipulates, transforms, and combines continuous and discontinuous materials; chooses materials, activities, and purposes; acquires skills with equipment and tools; discover and systematize the effects that actions have on objects, such as piercing, bending, blowing, breaking, squeezing, etc.; discover and systematize the attributes and properties of things) (p. 56).

For their part, Vidarte (*et al.* 2018) conceptualize exercise, its prevalence, and its direct relationship with health promotion strategies. The outcome was physical activity, which revealed definitions and estimates of an increase in energy intake above baseline, such as physical activity-related attitudes about health, therapy, exercise, and training.

This criterion is shared by Sánchez, (*et al.* 2019) who argue that:

The objective of the update is to promote physical activity in childhood and adolescence. And they conclude that, in the pediatric population, most health parameters, including weight and cardiometabolic health, are predominantly sensitive to aerobic activity (p. 67).

The researchers Carrillo and Pérez (2021) mention that in human and veterinary medicine, physical activity includes all body movements carried out through skeletal muscles that generate a waste of energy and personal experience and allow interaction with beings and the environment. environment that surrounds us. Although the previous criteria point to the relevance of physical activity, under this criterion, Gutiérrez (*et al.* 2018) state that physical activity is any movement produced by skeletal muscles that requires energy expenditure. Physical inactivity has been identified as the fourth risk factor for global mortality (6% of deaths worldwide). In addition, immobility is estimated to be the primary cause of approximately 21-25% of colon and breast cancers. Physical activity has a positive effect on the student's cognitive processes, although these effects seem to be felt in their academic performance in the short term. Secondly, there seems to be a strong connection between exercise intensity and executive functions, so further research would be of great interest to the scientific community. It is a variety of planned, structured, and repetitive physical activities designed to improve or maintain one or more parts of a physical condition.



Added to this experience, exploration and discovery is the opinion of Gómez (2017) in which mathematical logical knowledge defined in terms of the relationships established between objects, such as classification, analysis and discovering attributes of things; observe and describe the similarities and differences of things, group and match things by similarities and differences. Use and describe objects in different ways; talk about the characteristics that something does not possess or the class to which it does not belong.

Conclusions

The intervention with workshops and practical activities allowed to change the teaching model by proposing active tasks, which affected the development of learning with high school students. The planning of the activity was in charge of the teacher, who was in charge of emphasizing the exercises based on the methods, looking for solutions to obtain really positive results, which were reflected in the arithmetic mean, where the experimental group achieved a higher score than the group. control group.

The work deepened in the implementation of group workshops, in addition to physical activity, by including thought challenges from different areas, the process was carried out in a participatory manner to strengthen their physical and mental development at the same time, the effort rewarded. Students must find a genuinely cooperative attitude, in which case the proposal was aimed at strengthening the student's abilities, skills and abilities in their own learning in the advancement of independence along with various teamwork.

The proposal was implemented in the experimental group from the realization of workshops and physical activities, which was previously subjected to an evaluation, to choose an experimental group and a control group, the medians were made by checking the means of the lowest value on the scales. quantitative and qualitative so that after this evaluation, the experimental group in which the proposal was made was selected for 8 weeks, after which test, tests were developed to analyze the results obtained.

After the post-test, the researcher made comparisons with statistical analyzes to verify the effectiveness of the workshops and didactic activities proposed in comparison with the traditional methodology of the subject of physical education. The data obtained in the post-test were analyzed based on arithmetic medians, the value of the experimental group being 7.76, higher than the 5.87 of the control group, which led to the conclusion that the intervention fulfilled its purpose satisfactorily, with successful results that were also reflected in their learning and performance in the classroom.

Based on the results obtained and the calculated averages, the control group and the experimental group were selected as those named in the pre-test evaluation, when after the implementation of the proposal was completed, the intervention advanced with workshops and physical activities based on institutional and educational regulations to satisfactorily comply with the analysis. The experimental group intervened for 8 weeks in the second year of high school, during the first week carrying out three workshops and physical activity, in the following seven weeks only carrying out physical activities with cognitive challenges, with satisfactory results of 92% on the quantitative scale, where the questionnaire showed that the students were in complete agreement on the qualitative scale.



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