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Original article

Games to increase physical activity in inactive university students in their school day

Juegos para incrementar la actividad física en estudiantes universitarios inactivos en su jornada escolar

Jogos para intensificar a atividade física em estudantes universitários inativos durante o dia de aula

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ABSTRACT

The present research was carried out at the "Jesús Montané Oropesa" University, with the objective of assessing the effect of the implementation of recreational games to increase physical activity in inactive university students during their school day. Theoretical methods were used, among which we can mention analysis and synthesis, induction-deduction and historical-logical. The empirical methods used were observation, document review, survey and opinion poll. Measurement was used as a technique for data collection. The SPS statistical-mathematical package was also used to process the information. As a result of this work, a compendium of games was achieved that will allow to solve the main deficiencies identified in the diagnosis and, in a continuous way, to increase the levels of physical activity in inactive university students during their school day.

Keywords: Recreational games; Physical activity; Physical inactivity; Sedentary.

RESUMEN

La presente investigación se llevó a cabo en la Universidad "*Jesús Montané Oropesa",* con el objetivo de valorar el efecto de la implementación de juegos recreativos para incrementar la actividad física en estudiantes universitarios inactivos, en su jornada escolar. Se emplearon los métodos teóricos, entre los que se pueden citar análisis y síntesis, inducción-deducción y el histórico-lógico. Los métodos empíricos se empleados fueron la observación, revisión de documentos. Se utilizó la medición como técnica para la recopilación de datos. La encuesta, el sondeo de opinión. Se empleó, además, el paquete SPS entre los estadísticos matemáticos para el procesamiento de la información. Como resultado de este trabajo, se logró un compendio de juegos que permitirá solucionar las principales deficiencias identificadas en el diagnóstico y, de manera continua, incrementar los niveles de actividad física en estudiantes universitarios inactivos en su jornada escolar.

Palabras clave: Juegos recreativos; Actividad física; Inactividad física; Sedentario.

RESUMO

A presente pesquisa foi realizada na Universidade "Jesús Montané Oropesa", com o objetivo de avaliar o efeito da implementação de jogos recreativos para aumentar a atividade física em estudantes universitários inativos, durante o dia escolar. Foram utilizados métodos teóricos, entre os quais podemos citar análise e síntese, indução-dedução e histórico-lógica. Os métodos empíricos utilizados foram a observação e a revisão de documentos. A medição como técnica de coleta de dados. A pesquisa, a pesquisa de opinião. Além disso, o pacote SPS foi utilizado como um pacote estatístico-matemático para o processamento de dados. Como resultado deste trabalho, foi alcançado um compêndio de jogos que permitirá resolver as principais deficiências identificadas no diagnóstico e, de forma contínua, aumentar os níveis de atividade física dos estudantes universitários inativos em seus dias de escola.

Palavras-chave: Jogos recreativos; Atividade física; Inatividade física; Sedentário.

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INTRODUCTION

Currently, there are many definitions of sedentary lifestyle, although, in general, it is assumed to be the person who does not perform at least 30 min of exercise on most days of the week or who does not spend more than 600 metabolic equivalents METs/min per week (Crespo-Salgado, J., 2015). Another definition of sedentary is associated with the time spent by an individual sitting or lying down (Healy, 2011) or it can also be called sedentary that individual who spends less than 1.5 Mets-h^{-1} and per day, in leisure time physical activities, works sitting down and spends less than one hour per week walking, in transportation activities (Hart, 2011).

The consequences of physical inactivity are as harmful to health as smoking (Mulvihill, 2011). Although this phenomenon is present in considerable numbers in virtually all developed and developing countries. In developed countries, more than half of adults are inadequately active. In the large, fast-growing cities of the developing world, inactivity is an even greater problem. Urbanization has created several environmental factors that discourage physical activity.

This is due, in part, to insufficient participation in physical activity during leisure time and an increase in sedentary behaviors during work and domestic activities. The increased use of passive means of transport is also another factor that has had an impact on the decline in physical activity levels. Numerous researches show enough evidence to prove that physical inactivity is the factor that has the greatest impact on disability and deaths caused by non-communicable diseases. A study conducted by Dr. I-Min Lee and colleagues in several countries around the world, published in 2012 by the medical journal The Lancet, estimates that physical inactivity causes 6-10 % of deaths related to coronary heart disease, type II diabetes mellitus, as well as breast and colon cancer. Furthermore, it shows that sedentary lifestyles cause 9 % of premature deaths, which in 2008 accounted for 5.3 million of the 57 million worldwide, a figure even higher than the 5.1 million deaths attributable to smoking (Duperly, 2019).

Some of the aforementioned authors consider that sedentary lifestyle increases with the age of people, identifying a greater amount among females in relation to the male population.

In Cuba, the study of the prevalence of sedentary lifestyles has shown a significant increase, taking as a reference the historical results published in the Pan American Journal of Health (Landrove-Rodríguez, 2018).

These data have shown a tendency to increase, have taken into account the results obtained in the 1990s, where the prevalence of sedentary lifestyle, specifically in the year 1995, was 33 %. This data, as a consequence of the economic situation that the country was going through, originated an increase in the use of bicycles and walking as a means of transportation in the population; the former was used more by men and the latter by women. After this stage and with an improvement of the economic conditions in Cuba, the prevalence of sedentary people increased to 36.5 % in 2001 (Pérez, 2007).

This phenomenon is increasingly occurring at early ages, so its prevention is a priority for the World Health Organization (WHO), which requires the greatest number of intersectoral policies involved.

to study and the gradual decrease in the amount of activities that imply a high caloric expenditure as a consequence of their transition from high school to higher education, where the likes for the practice of physical activities is disappearing in general.

Regular physical exercise constitutes an alternative in the improvement of physical fitness, from initial education to university, so increasing the levels of physical activity at these ages becomes one of the fundamental premises for the improvement of health, from a preventive approach.

There have been many researches in recent years that have provided a significant theoretical reference, based on works developed in American Universities on the subject, which show a tendency to increase body weight. These manifestations are characterized by developing in inactive periods and activities are performed in a standing or sitting position. These activities are associated with leisure time, in which they do not perform activities that involve an energy expenditure higher than the caloric intake, an increase in the number of hours in front of the television, video games, internet among others. (Moreno-Bayona, 2018); García, 2018); Sánchez-Guette, 2019). This constitutes an alarming factor, starting from what the university represents for the economic development of any country, as well as for society today.

The empirical inquiries carried out for this research and the personal experiences of the authors at the University of La Isla de la Juventud evidenced a decrease in the physical activities developed by students, in addition to having more than four hours a day dedicated to sedentary activities and low caloric expenditure. These are the reasons why it is proposed as an objective of this research to assess the effect of the implementation of recreational games to increase physical activity in inactive university students during their school day at the University "Jesús Montané Oropesa".

The proposed objective not only prevents the appearance of diseases associated with physical inactivity, but also increases the levels of physical motor performance and helps to dissipate the stress produced by the teaching content. This work also contributes to the axiological component and to the decrease in the use of telephones, which is typical of this age group.

MATERIAL AND METHODS

The research was carried out at the "Jesús Montané Oropesa" University, with students of the CRD (regular daytime course) between the first and fifth year.

This work was carried out between the months of February to May 2016, a total of 355 students of the daytime course, from the Accounting, Agronomy and Computer Science careers of this university institution participated.

A sample of 100 students was taken, which represented 28 % of the total population (355) of the university; of these, 40 were female and 60 were male, with an average age of 21.3 years. As criteria for the selection of the sample, it was taken into account to be part of the students of the University of La Isla de la Juventud of the daytime course, to be between 17 and 25 years old, to have voluntarily agreed to participate in the research, to be physically fit for the realization of the games and exercises.

This group of students was advised by a work team made up of recreation teachers and specialists in weight training, as well as teachers of theory and practice of games, with more than 15 years of experience in each of these specialties.

First, and as part of the diagnosis, the activities carried out by the students during their school day at the University of La Isla de la Juventud were observed. We then proceeded to survey them about the activities carried out in a daily routine, inside and outside the institution, based on a questionnaire, which includes among the questions asked the time dedicated by them to the realization of physical activities by type and duration, as well as to determine preferences of physical activities or games that may be applicable.

The surveys also inquired about family members with a history of diseases related to sedentary lifestyles, including obesity, diabetes, blood pressure problems and metabolic disorders.

Body mass index (BMI) was calculated and evaluated according to the established procedure. Below 18.5, the patient was considered underweight, between 18.5-24.9 normal, between 25.0-29.9 overweight, and 30.0 or more, obese.

With the purpose of verifying the feasibility of recreational games to increase physical activity in inactive university students during their school day at the "Jesús Montané Oropesa" University and to evaluate their effectiveness, as part of the research work developed, scientific observation was used and, for this purpose, measurement was used to compare both results of the initial and final diagnosis. Once it was concluded, a survey was made to the selected sample, with the objective of measuring the level of satisfaction after the recreational games were applied.

The SPSS statistical package was used to tabulate the results.

RESULTS

The results obtained from the application of the research tools allowed confirming that: 73 % of the students live at a distance of approximately 3.5 to 5 km. from the University; 19 %, at a distance of approximately 10 km. while the remaining 8 % live more than 10 km. from the center where they study.

In terms of transportation to the university, 57 % use bicycles, while the remaining 43 % use cars, motorcycles or public transportation.

The average time taken by type of transportation showed that those who access the university by bicycle take approximately 15 to 20 minutes, those who access by transportation and live 10 km or more from the university take approximately 30 to 45 minutes, while those who live between 3 and 5 km from the university and who access by car or motor vehicle take between 6 to 8 minutes to get there.

The question regarding the like for physical activity shows that 53 % do not like physical activity, while 47 % responded affirmatively. The first ones report not having time, as well as not having the resources and the knowledge to do them, so they do not feel motivated. The second group that responded affirmatively reported that physical activity is beneficial for their health and for keeping in good physical shape.

Regarding the number of times they do physical activity, 33 % do not do it, 42 % do it in Physics (Physical Education) classes, twice a week, while the remaining 25 % stated that they do sports 3 to 5 times a week.

On average, they dedicate 45 min. to two hours on the days they engage in physical activities, especially males.

Among the preferences for activities, 48 % prefer recreational sports, 22 % prefer cultural activities, while the remaining 19% prefer passive activities, without much physical effort.

Regarding sitting time, 62 % spend an average of 5 to 6 hours a day sitting in the classroom, 28 % 3 to 4 hours, while the remaining 10 % spend 3 hours or less.

Regarding the level of health, 83 % stated that they did not suffer from any illness, 11 % had some illness, and the remaining 5 % said they were aware of it.

Regarding family history, 38 % had a history of obesity, while 55 % had problems with blood pressure or diabetes, the remaining 7 % had no family history.

With regard to leisure activities, these can be seen in Table 1.

Table 1. - Activities carried out by the students, objects of study, in their spare time

As for with whom they would like to carry out physical activities, 73 % stated that they prefer to do them with friends; 3 %, with the family; 15 %, alone, while the remaining 9 % with any other person.

The collection of data to determine the body mass index was carried out in the massage classroom of the Physical Culture Faculty; a scale was used to weigh and measure them, with the participation of the students themselves in the calculation of their BMI.

The data obtained were as follows: 34 % classified as underweight (under 18.5), 42 % classified as normal (18.5 - 24.9) and 24 % classified as overweight (25.0 - 29.99) with a predominance among males in this last indicator.

In the comparison of body weight, there is an increase of approximately between 2 and 3.14 kg among males, while among females, the increase is greater between 2.9 and 3.3 kg as a general average.

The research motivates to state the name and description of recreational games to increase physical activity in inactive university students during their school day.

1. The stretcher of assistance: in pairs, two teammates take a stretcher made of two sticks, approximately 1.70 meters long, take a tarp and lay down a member of the team and move him from the selected distance to the goal. The game not only aims to lift and move objects, but also to reinforce elements learned in preparation for defense.

2. Moving the treasure: moving objects of different shapes and sizes, objects from pre-established places to the goal. They are carried out in teams and the winner is the one who does it in the shortest time possible.

3. Cross the river: two marks are drawn and two males are selected to be in charge of passing the eight females from one place to the other of the river. He can do it one at a time or he can carry two at a time or all four if he can handle them. The winner is the one who does it the fastest in the shortest time possible.

4. The skiing rope: six players participate, get a board where one person can fit comfortably, make five marks with a distance of one meter between one and another, take two ropes that are tied at each end of the board. The team members are assembled, reaching the mark and returning to the starting point to increase one meter to be pulled by two team members, then three team members and so on until all the team members pass.

5. The skiing rope: six players participate, get a board where one person can fit comfortably, make five marks with a distance of one meter between one and another, take two ropes that are tied at each end of the board. The team members are assembled, reaching the mark and returning to the starting point to increase one meter to be pulled by two team members, then three team members and so on until all the team members pass.

6. Throwing the disc: a 15 kg disc is taken and thrown backwards by each member of the team. The distance covered by the implement is added up and the team that covers the greatest distance wins. The women throw it from the front.

7. Raw material: A scale will be used and will be located 25 meters from the starting line. A sack will be assigned to each team. The sum of the weight of all the objects must be equal to 50 kg, but it will be done in the following way: the first member of the team goes out with the empty sack to look for an object to throw into it and returns to his initial position, goes to the scale in the shortest time possible, weighs the object and returns to the starting point and delivers the sack to the next participant who will perform the same operation. **Note**: all members must participate and the 50 kg must be distributed among the total number of participants to prevent a single player from reaching the weight.

The work was implemented between the months of February and May 2016, and was carried out three times a week, for a period of 121 days. Between 6 and 8 games were worked per frequency, with a rest interval between 1-3 minutes, depending on the weather. Alternate weeks were worked, at different times; in the morning, from 9.00 a.m.-10. 45 a.m., while in the afternoon, it was worked from 4.00 p.m.-4.45 p.m. -4:45 p.m. The sports areas of the University of La Isla de la Juventud, baseball field, soccer field and gymnasium of the University of La Isla de la Juventud were used.

For the implementation of the set of games, the results of the diagnosis were taken into account as an essential element, which allowed corroborating the problematic situation and provided information that served to determine the causes that affect the levels of physical activity and from the likes and preferences, implement the alternative solution encouraging the levels of physical activity inside and outside the institution, from the consequences they cause in the health of students and the harmful effects on the family economy. It also allowed socializing some of the contributions of physical activity in the short, medium and long term, which also allowed reinforcing the axiological component,

which contributed to increase the levels of interaction among students from different groups.

DISCUSSION

From the implementation of the recreational games and the comparison of the initial and final diagnosis, the number of students who travel by bicycle to the University increased by 7 %, there is an increase of 24 % in the liking for physical activities. There is a 47 % increase in the level of motivation for their practice, an 11 % increase in the number of participants in sports activities, as well as a 9 % increase in the number of days of the week dedicated to physical activities outside the Physical Education shift.

The number of recreational sports activities increased to 64 %, incorporating movement games.

Stretching activities are incorporated in class shifts, after more than 45 minutes of passive activities.

The 90% of the students recognize that the incorporation of physical activities into their daily routine prevents the onset of obesity, blood pressure problems or diabetes, among others, being more susceptible in those with a family history.

Group sports practice increased by 15 %, which contributes to group cohesion. The time dedicated to cellular telephony decreased by 3 %.

The body mass index: showed a significant change with respect to the initial diagnosis, the low weights decreased by 8 % (below 18.5), those classified as normal weight (18.5 - 24.9) increased by 12 % and those classified as overweight students (between 25.0 - 29.9) decreased by 4 %, although it should be noted that the male sex remained the most predominant with overweight.

The analysis of the survey carried out at the end of the research showed that:

That 100 % of the participants responded that they had learned a lot from the games and that they had helped them to get along better with their classmates and to share. The games and activities they played were motivating, exciting and made them, once again, feel like children and share with students from other careers that they barely knew as true friends. Eighty-five percent agreed to receive similar activities again as a recreational option. Among the games with the highest preference, the results were:

1. Raw material, with 45, because it is an activity that, despite the fact that it is done so much, the impact is not distinguished.

2. Gaining awareness, 40 responded: the stretcher of assistance, because it reminded them of childhood moments and contents of preparation for defense.

CONCLUSSIONS

After analyzing the data obtained, the level of acceptance of the games to increase physical activity in the students of the University of La Isla de la Juventud, inactive during their school day, and the disposition of them for future similar works, were high by the beneficiaries, they recognized the contribution of the games and the possible effects in the short, medium and long term, due to their preventive character, besides the possibility of using the own resources that the institution has, taking into account the likes and preferences of the students involved. And although the research had a relatively small sample, it can be applicable to any educational institution, adapting the games to the age of the participants.

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Authors' contribution:
Osmany Aguero Fuentes: Conception of the idea, literature search and review, instrument making, general advice on the topic addressed, drafting of the original (first version), review and final version of the article, translation of terms or information obtained, review of the application of the applied bibliographic standard.

Yidier Pons Gámez: Instrument application, statistic analysis, drafting of the original (first version), review and final version of the article, review of the application of the applied bibliographic standard.

Yoanni Gil López: Instrument application, compilation of information resulting from the instruments applied.

Rafael Ernesto Licea Mojena: Instrument application, compilation of information resulting from the instruments applied, statistic analysis, general advice on the topic addressed, review and final version of the article, article correction, review of the application of the applied bibliographic standard.