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Original article

Games to increase motivation towards physical activity in older adults

Juegos para elevar la motivación hacia la actividad física en adultos mayores

Jogos para aumentar a motivação para a atividade física em adultos mais velhos

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ABSTRACT

The decline in fertility and mortality rates has increased the percentage of people over 60 in Cuba. In this group, important changes are taking place in the psychosocial and biological spheres, where the practice of regular physical exercise is one of the main



non-pharmacological strategies for ageing in a healthier way and improving the health-related quality of life of the elderly. However, there is an insufficient motivation on the part of the older adult towards physical activity, so it is proposed to apply a set of games that contribute to increase the motivation towards physical activity of them for which theoretical and empirical methods were used. The set of games is based on the methodological indications for the work with this population group and the methodological steps for the application of the games. The application of the statistical methods, verified that there are differences between the measurements made, after applying the set of games, which allows affirming the positive effect in the motivation towards physical activity in the elderly.

Keywords: Physical activity; Older adults; Games, motivation.

RESUMEN

La disminución de la fecundidad y de las tasas de mortalidad ha aumentado el porcentaje de personas mayores de 60 años en Cuba. En este grupo se producen cambios importantes en las esferas psicosociales y biológicas, donde la práctica de ejercicio físico regular es una de las principales estrategias no farmacológicas para envejecer de forma más saludable y mejorar la calidad de vida relacionada con la salud de las personas mayores. Sin embargo, existe una insuficiente motivación por parte del adulto mayor hacia la actividad física, por lo que se propone aplicar un conjunto de juegos que contribuyan a elevar la motivación hacia la actividad física en los adultos mayores, para lo cual se utilizaron los métodos de carácter teórico y empíricos. El conjunto de juegos se sustenta en las indicaciones metodológicas para el trabajo con este grupo poblacional y los pasos metodológicos para la aplicación de los juegos. La aplicación de los métodos estadísticos, constató que existen diferencias entre las mediciones realizadas, después de aplicado el conjunto de juegos, lo que permite afirmar el efecto positivo en la motivación hacia la actividad física en los adultos mayores.

Palabras clave: Actividad física; Adulto mayor; Juegos; Motivación.

RESUMO

A diminuição das taxas de fertilidade e mortalidade aumentou a percentagem de pessoas com mais de 60 anos de idade em Cuba. Neste grupo, há importantes mudanças nas esferas psicossocial e biológica, onde a prática de exercício físico regular é uma das principais estratégias não farmacológicas para envelhecer de forma mais saudável e melhorar a qualidade de vida das pessoas idosas relacionada com a saúde. No entanto, existe uma motivação insuficiente por parte do adulto mais velho para a atividade física, razão pela qual se propõe aplicar um conjunto de jogos que contribuem para elevar a motivação para a atividade física nos adultos mais velhos, para os quais foram utilizados os métodos de carácter teórico e empírico. O conjunto de jogos baseia-se nas indicações metodológicas para o trabalho com este grupo populacional e nos passos metodológicos para a aplicação dos jogos. A aplicação de métodos estatísticos mostrou que existem diferenças entre as medições efetuadas após a aplicação do conjunto de jogos, o que nos permite afirmar o efeito positivo sobre a motivação para a atividade física em adultos mais velhos.

Palavras-chave: Atividade física; Adulto mais velho; Jogos; Motivação.



INTRODUCTION

The decrease in fertility and mortality rates, in all countries of the world, tend to transform the population pyramid, expanding its top and narrowing the base, gradually making developed or developing nations face this reality and assume the consequences derived from it.

According to the **National Bureau of Statistics and Information (2019)** in the Statistical Yearbook of Cuba 2018, 20.4% of Cubans are 60 years of age or older, placing Cuba among the most aged nations in the American continent. In Holguín province, life expectancy at birth is 79.80 % in both sexes, above the national average. The population of 60 years and more is 208 632 in the province for 20.30 % while in the municipality this population reaches 67 545 for 19.24 % placing us close to the national average, placing us according to the criteria of population aging in demographic old age.

The aging of the human organism, besides being a normal and irreversible stage of life, is a very special form of the movement of matter. It is a complex and varied process that depends not only on biological causes, but also on the socioeconomic conditions in which the individual develops as a social being, as well as on psychological and environmental factors that give prominence to the insecurity originated, among other aspects, by the cessation of working life, the disintegration in some cases of family ties and the tendency to isolation due to the decrease of motivations, thus influencing a less active behavior (**Ceballos, 2001**).

The reduction of motor faculties sufficiently explains the frequent insecurity of movement and the need for assistance to the elderly. The phenomenon of motor senility is ultimately inevitable, but it can be mitigated if physical exercise and sport are not abandoned during this period, thus postponing to a large extent the deterioration of motor faculties.

The practice of regular physical exercise is one of the main non-pharmacological strategies to age in a healthier way and improve the health-related quality of life of the elderly. This phenomenon is due to the beneficial effects that the practice of physical exercise has on biological and psychosocial variables of the being and that materialize in a very evident way in elderly people.

In Cuba, as a consequence of the work of the Revolution throughout its 60 years, it has conceived basic national programs, aimed at specific activities of integral attention to different population groups, control of communicable diseases and occupational medicine. Since the 80s of the last century until today, actions have been developed to ensure comprehensive health care, where one of the most benefited sectors is the elderly.

In 1984, the Grandparents' Circles emerged and became official in 1986 through programs coordinated between MINSAP and the National Institute of Sports and Recreation (Inder) with the purpose of incorporating middle-aged and elderly people into the systematic practice of physical activity.

In physical exercise classes with the elderly, motivation is a vitally important element that contributes to awaken in them the desire to participate in physical and sports activities. Motivation implies a broad understanding of the needs of the participant's personality, this becomes evident when the older adult performs an activity that is pleasurable to him/her, that satisfies his/her own life needs, leads to an improvement



in his/her physical development and favors the formation of appropriate attitudes and values and systematic practice habits.

Studies by [Morales and Mendoza \(2011\)](#), [Castro and González \(2011\)](#), [Constanza \(2015\)](#), [Muñoz \(2016\)](#), [Byron and Gutiérrez \(2017\)](#) and [Creagh, Cazull and Hernández \(2018\)](#) have been directed fundamentally from the psychological point of view, to assess and trace guidelines related to the behavior and motivation of the older adult according to their needs and interests, to project the forms of development of physical recreational activities and those related to the linkage towards socio-cultural macro projects in urban communities; However, no reference is made to the need to ensure that the grandparents' circles can perform as an adequate means to satisfy psychosocial and biological needs in order to motivate active and consistent participation through the associative management of its members.

It is evident that in this projection the incorporation and permanence of the older adult to the physical activity programs are low and in the classes of the older adult the games are confined to the final part of the same, their presence in other parts are insignificant or simply null.

In accordance with the above, the authors questioned how to increase motivation towards physical activity in older adults incorporated into physical activity programs and proposed as an objective to apply a set of games that contribute to increase motivation towards physical activity in older adults.

MATERIALS AND METHODS

A quantitative, pre-experimental and exploratory pilot study was carried out on a sample of 17 elderly people between 60 and 75 years of age, randomly selected (tombola technique) and representing 81.81 % of the population of older adults, belonging to the circle of grandparents "Alegría de Vivir" of district # 8 of the Popular Council Alcides Pino Bermúdez of the Municipality of Holguín.

The sample was made up of female elders, with $x = 67.25 \pm 4.13$ years old, to whom it was determined with the use of the measurement method of the Behavior Regulation Questionnaire in Exercise (BREQ-3); before applying the set of games, after six months (from September 2019 to February 2020), the second measurement was made and at the end a comparative analysis was made between both measurements according to protocol.

In the statistical analysis, the calculation of median differences between pretest and posttest with the Wilcoxon test (signed ranks for related samples) was used. The data were processed using the IBM SPSS Statistic -20 statistical package.

The research was conducted following the standards of the Ethics Committee, where all participants gave informed consent, according to the principles of the Declaration of Helsinki 2008 World medical association.



RESULTS AND DISCUSSION

For the creation of a set of games that contribute to increase motivation towards physical activity in older adults, the characteristics of the game given by **Herminia Watson (2008)** were taken into account, which should be taken into consideration to understand the concept of this activity, as well as its classification. The games conceived in this work were compiled from different authors with the application of some modifications to use them with the older adults belonging to the circle of grandparents. These were implemented within the classes for the elderly, mainly in the initial part of the class.

Game 1: News-headlines

Objective: to diagnose criteria about a topic (in this case the importance of physical exercise).

Materials: sheets with headlines, pencils, crayons, etc.

Organization: scattered in the field

Development: the teacher shares a news item with the group about a curious fact that happened in a city. It is related to several articles about a topic that were published in different newspapers. Something unexpected happened to the articles: the information was erased from the archives where they were kept and only the headlines remained.

Faced with this fact, the editors are very concerned and rely on the group to help them solve the problem presented. On the blackboard, the teacher shows the headlines.

The proposal is:

- Benefits of physical exercise for the elderly.
- Health and physical exercise.
- Sedentarism versus physical activity.

As a next step, motivate the participants to form into four groups and develop the following activities:

- Choose one of the headlines.
- Let their imagination run wild and together propose what the contents of those headlines could be (organize the ideas and write them down).

At the end of the second step, the results of the work are presented in plenary.

Reflections are directed towards:

- The most significant within each headline.
- Whether or not problems are reflected; if any, suggestion for their solution.
- If subjective aspects were taken into account?



Rules: all participants must contribute ideas. The groups that stood out for the breadth of their imaginative capacity in reflecting objective and subjective factors, problems, solutions and potentialities are highlighted. Variants: in the analysis, other elements can be incorporated into the content of the headlines, as considered by the group.

Game 2: Open the drawers!

Materials: blackboard or poster

Objectives: to stimulate the search for collective actions according to their motivation towards physical activity.

Organization: four teams are formed.

Development: the teacher talks with the participants about the importance of the contribution that each one can make for their own wellbeing. A cabinet drawn on the blackboard or poster with four drawers is presented and it is explained that as everyone knows, in the closet we keep what has a certain value. These drawers open and close depending on our needs and motives. Each drawer represents different actions:

- Things we must preserve (habits, customs, lifestyles).
- Things that need to be modified.
- Things that need to be eliminated.
- The rules and regulations that are required.

Individually, participants define what they would put in each drawer, according to their criteria and opinions about their lifestyle. They write down their ideas and stick the card in the corresponding drawer. Once this work is completed, the teacher invites them to work under the slogan: Open the drawers! To do this, four teams are formed and each team is given a drawer, the common ones are grouped together, the differences in approach are analyzed, and how to make them more precise are analyzed, and once the analysis is agreed upon, it is recorded on the sheet.

Rules: all team members must participate.

Each group presents the results of its work in a plenary session, thus favoring an analysis of the situation in the group based on the relationships that can be established between one drawer and the other.

Variants: the teacher may place one or more ideas in each drawer to reinforce the criteria.

Game 3: Sea, land and sky.

Materials: none.

Objective: to encourage interest in the practice of physical exercise.

Organization: a straight line is drawn to delimit the areas of sea and land, where the participants will be placed in a line.



Development: when the teacher says "Sea" the participants must step forward, when he says "land" they must return to the line, but if they say "land" and they are in the line they must stay in the same place, the same if they are in the sea, when the teacher says "sky" the participant will raise both arms.

Rules: When the teacher gives this order, it must be followed. The movements must be made as quickly as possible without compromising the balance of the participants.

Variants: increase the distance between the sea and land zones by drawing another parallel line to facilitate the movement of the participants.

Game 4: Playing geography.

Materials: none.

Objective: to promote memory and cognitive interest.

Organization: participants will be placed in a row or circle.

Development: this game will start when the first participant says the name of a town, village or city. For example: Point out the town Alcides Pino. Then, the partner who follows in order must immediately name another town whose first letter must be equal to the last letter of the town mentioned by the first player, say, for example "Answer this", Oriente, as you will see the first letter of this town is the "o" which in turn is the last letter of the previous name.

The game continues when the player in turn expresses the name of a town with the letter "e" and so on, the player who cannot say the name of a town in the time fixed will be eliminated from the game. **Rules:** 1-An answer must be given within the time allotted. 2 - No player may repeat the name already expressed by a teammate. 3-The players may not tell each other the answer.

Variants: the name of fruits, animals, etc. can be used.

Game 5: Letter games **Materials:** cardboard with letters.

Objective: to encourage interest in physical activity and memory.

Organization: Participants line up in a row.

Development: The teacher hands out a cardboard card to each participant, it contains a letter. The teacher says a word, participants must place themselves in the order according to their letters.

Rules: They can only place themselves if they contain the letter that corresponds to the word.

Variants: can be done with numbers.

Game 6: The change of cubes.

Materials: wooden cubes, benches or boxes.

Objective: to promote agility, dexterity and teamwork.



Organization: two teams formed in rows behind the starting line, five meters away, a bench or box is placed in front of each team. A white cube is placed on each one and the first participant of each team holds a cube of the color that represents his team.

Development: at the teacher's signal, the first participant of each team moves quickly (walking), changes the cube in his hand for the one on the bench and returns to give it to the competitor who follows him in the line, placing himself at the end of the line. The competitor who received the cube makes the same route, and so on until each one occupies his initial place.

Rules of the game:

1. The team that finishes first and lifts the bucket wins.
2. The competitor who is going to leave has to wait behind the line until the bucket is delivered.
3. The team that leaves early will be cautioned with 2 seconds off.
4. Running is not allowed. Variants: increase the distance of displacement, or the number of teams.

Game 7: Ball to the box.

Materials: cardboard boxes, small balls.

Objective: to contribute to throwing precision and motivation towards physical activity.

Organization: two groups formed in rows behind a starting line; a line is painted five meters away and in front of it two circles (one in front of each team), in each circle a small box will be placed.

Development: at the teacher's signal, the first competitor advances quickly to the intermediate line, takes a ball from the circle and throws it into the box, then goes to the line, touches the teammate who follows him and joins the end. The team that finishes first wins. If there is a tie, the team with the most baskets wins.

Rules of the game:

1. The throw must be made behind the line.
2. The player must not go beyond the starting line until he has been touched by the returning player. Variation: increase the distance of displacement or throw.

Game 8: Pineapple-Orange.

Objective: to work on mental agility and memory.

Organization: the group is placed in a circle with the teacher in the center.

Development: it consists of giving the name orange to the right arm and pineapple to the left arm. When the teacher turns to a student and says orange or pineapple, the student will say the name of the classmate next to him. Two or three repetitions will be made and then the students will change position, thus changing the partner next to each one.



Rule of the game: the partner who gets confused moves to the center of the circle and performs an action designated by the teacher or a participant.

Variants: the name of the fruits can be changed by the name of animals.

Game 9: A man of principles.

Objective: to promote mental agility and interest in physical activity.

Organization: the participants form a circle and the teacher stands in the center of the circle. The game begins with the narration of a fictitious story elaborated by the teacher.

Development: the teacher starts the story and points to a participant to complete the sentence he started. Example: Teacher: my uncle is a very principled man, for him all words must begin with the letter "P". His wife is called.... and points to a learner, the learner responds: Student 1: answers "Pura". Teacher: she likes to eat a lot.... Student 2: answers "cucumber". Teacher: she found a... Student 3: answers "dog".

Rule of the game: the student who does not know how to say the possible word will move to the center of the circle where he/she will perform an action designated by the teacher or a participant.

Variation: the participants will bring the script of their stories and one can be chosen at different times.

Game 10: Chaos.

Materials: cardboard.

Objective: to contribute to the agility and coordination of the elderly.

Organization: the students will be scattered around the field. Each one will be given a card indicating the action to be performed, such as singing, dancing, imitating animals, etc.

Development: the participants will walk around the area, and at the sound of the whistle they will begin to perform the action that is their turn. When the teacher blows the whistle again, they stop the action they were performing. After two or three repetitions, the cards are exchanged.

Rule of the game: the participant who does not stop the action he/she is performing when told to do so, must perform an action designated by the teacher or a participant.

Variation: the action may be to represent the movement of a sport.

Game 11: Bowling game.

Materials: rag balls and 500 ml. plastic knobs filled with sand up to a quarter of the container.

Objective: to promote joint mobility of the upper limbs.

Organization: teams formed in rows behind a throwing line.



Development: participants throw the rag balls towards the containers located five meters away from the throwing line. Each participant must make three throws.

Rules:

- He/She must knock down as many containers as possible.
- He/She must throw with his arm extended and under his shoulder.
- The team that knocks down the most containers wins.

Variants: the throwing distance is increased up to 8 m. The number of throws is increased. The tool that made possible the collection of information was the Behavior Regulation in Exercise Questionnaire (BREQ-3), which was implemented as a tool for the research process, since it allows obtaining and elaborating data in a fast and efficient way. Instrument headed by the sentence "I do physical exercise", composed of a total of 23 items: four for intrinsic regulation, four for integrated regulation, three for identified regulation, four for Introjected regulation, four for external regulation and four for demotivation.

Intrinsic motivation is supported by a succession of psychological requirements (self-determination, effectiveness, curiosity) that are responsible for the initiation and continuity of human behavior with the abandonment of extrinsic sources of motivation. Intrinsic behaviors encourage the older adult to seek innovation and challenges, achieving satisfaction towards himself. The extrinsically motivated older adult works to achieve extrinsic motivators such as money, self-enhancement or social recognition. The intrinsically motivated older adult intrinsically motivated woman fulfills her activities, achieving that these activities fill her with pleasure (Soriano, 2001).

According to the responses and data tabulation, it indicates that the mean and standard deviation in the first measurement behaves as follows, $=7.29 \pm 2.73$ points (points.) where 52.94 % of older adults obtained in their surveys a value equal to or less than eight points, referring to intrinsic motivation, evaluated by the items: (4, 12, 18, 22, of the questionnaire (BREQ-3), valid to a maximum of 16 points), the remaining 47.06 % scored above eight points, this represents that eight older adults who practice physical activity in the circle of grandparents, Perform Physical Exercise: "Because they find exercise a pleasant activity and find it pleasant and satisfying". The second measurement shows an increase in the mean by 2.12 points. With $=9.41 \pm 2.42$ points. And 70.58 % of the respondents above eight points.

Research in this field yields similar results such as Byron and Gutierrez (2017) and Creagh, Cazull and Hernandez (2018) where they agree that intrinsic behaviors encourage human beings to seek innovation and challenges, achieving satisfaction towards this same, they are committed to activities that are to their liking and engage with pleasure in them, factors that affect the increase of this indicator after applying a stimulus (games) in the daily routines of physical activities.

The results of the next indicator, integrated motivation, are similar to the previous one in determining that 52.94 % of older adults obtained in their surveys a value equal to or less than eight points, evaluated by the items (5, 10, 15, 20) of the questionnaire (BREQ-3, valid to a maximum of 16 points), the remaining percentage scored above eight points: (5, 10, 15, 20, of the questionnaire (BREQ-3), validated to a maximum of 16 points), the remaining percent scored above eight points; this represents that eight older



adults who practice physical activity in the grandparents' circle, Perform Physical Exercise: because they see physical exercise as a fundamental part of who they are and consider that it is in accordance with their values. The mean increase was 1.29 points. Initial= 7.00 ± 2.39 points. Final = 8.29 ± 2.17 points.

In the works of Muñoz (2016) and Byron and Gutiérrez (2017), they attribute the increase of this indicator in their analyses to the games applied, since the game becomes a learning spring and goes beyond its primary object of recreation, where the educational value of the game is reaffirmed, carried out with a predetermined objective, which goes beyond entertainment and pleasure.

According to Reeve (2003) integrated motivation seeks to change the behaviors and actions of older adults, it is a progressive development that includes self-assessment to achieve questioning from the experiences or behaviors of the person, where he/she groups his/her motivation with the current situations he/she is facing, that is, an identification with the other to generate an integral process, all from physical activity or physical exercise as an activity.

The *identified motivation* is another type of motivation within the field of extrinsic motivation, the identified regulation is aimed at autonomy, aimed at the older adult to accept the achievements or situations that are being presented, it is an important method in the motivation of older adults because it leads to questioning and generating a personal change from physical activity (Reeve, 2003).

According to the responses and data tabulation, it indicates that 70.58 % of the older adults obtained in their surveys a value equal to or less than 8 points, regarding the identified motivation, evaluated by the items: (3, 9, 17, of the questionnaire (BREQ-3), valid to a maximum of 12 points), the remaining 29.42 % scored above 8 points. 42 % scored above 8 points, this represents that five older adults who practice physical activity in the circle of grandparents, perform physical exercise: because they value the benefits of physical exercise, and think it is important to make the effort to exercise regularly. The difference between the means is 1.94 points. Initial = 5.53 ± 2.12 points. Final = 7.47 ± 2.21 points. Similar results are observed in the research of Muñoz (2016), who agrees on the importance of the appropriation of knowledge about the benefits of physical exercise in psychosocial and biological aspects in this age group.

Introjected motivation seeks that the older adult has objectivity of what he/she is projecting or performing, but implies being motivated by means of factors such as "could, should or similar". In the introjected regulation it is important that the older adult seeks the reward of what he/she is doing in a motivated way, in order to expand the emotions and contribute to personal development, who embraces this regulation is because his/her situation is directed under pressure, that is, the older adults of the grandparents' circle perform physical exercise or physical activity under pressure (Reeve, 2003).

According to the responses and data tabulation, it indicates that the mean and standard deviation in the first measurement behaves as follows, = 9.24 ± 1.43 points. Where 64.70 % of older adults obtained in their surveys a value equal to or less than eight points, evaluated by the items: (2, 8, 13, 19, of the questionnaire (BREQ-3), valid to a maximum of 16 points), this represents that 11 older adults who practice physical activity in the circle of grandparents, do physical exercise: because they feel guilty when they do not practice it or ashamed if they miss the session. In the second measurement, a decrease



of the mean by 1.65 points is observed. With $\bar{x}=7.59\pm 1.54$ points and 70.58 % of the respondents below 8 points.

Medical prescription and health are important aspects in the motivation towards the practice of physical activity in this group with 14.29 %. Muñoz (2016) obtains similar results by identifying this indicator as a determinant in a large percentage of his samples.

External motivation consists of a non-motivation by the own result, these situations are hand in hand with the external which feeds the older adult to perform the activities proposed, these motivations are of compensatory types that attack a motivational space. It is common in the external motivation, that the older adult has difficulties to undertake activities by himself, there must be an external incentive to be able to make the older adult initiate the activity with attitude. People motivated by external regulation show a low performance and insufficient results, because they need an external reward or an external motivation imposed by third parties to be able to perform the activities in this case physical activity or physical exercise.

Regarding this indicator, evaluated by the items: (1, 7, 13, 19, of the questionnaire (BREQ-3), valid to a maximum of 16 points), there is a difference between both measurements of 0.24 points. Increasing in the second measurement.

According to the answers and data tabulation, it can be seen that 52.94 % of the older adults obtained in their surveys a value equal or higher than eight points, referring to demotivation, evaluated by the items: (6, 11, 14, 23, of the questionnaire (BREQ-3), valid to a maximum of 16 points), this represents that nine older adults who practice physical activity in the circle of grandparents, are partially demotivated. This aspect changed favorably in the second measurement when the number of subjects with some traits of demotivation decreased to 17.64 %.

Table 1. - Summary of hypothesis testing of the BREQ-3 questionnaire

| Test | Null hypothesis | Test | Significance | Decision |
|---------------------|---|---|--------------|----------------------------|
| Intrinsic | The median of the differences between pretest and posttest is equal to 0. | Wilcoxon signed-rank test for related samples | ,001 | Reject the null hypothesis |
| Integrated | | | ,001 | |
| Identified | | | ,000 | |
| Introduced | | | ,001 | |
| Demotivation | | | ,001 | |
| External | | | ,102 | Retain the null hypothesis |

Source: IBM SPSS Statistic Viewer. Significance level 0.05

Through statistical processing, it was determined that all the indicators evaluated except external motivation obtained results $\alpha = 0.001$ and 0.000 , being \leq that $\alpha = (0.05)$, so it can be stated that there are significant differences between the first and second measurements (Table 1).



CONCLUSIONS

In the criteria of the scientific community regarding the motivation towards physical activity in older adults, there is a common opinion that games have a great biological, psychological, sociological and pedagogical value, which make them a necessary means for the formation and strengthening of the personality.

In the compilation of the set of games to contribute to the motivation towards physical activity in older adults, the methodological indications for the work with this population group and the methodological steps for the application of the games are supported.

The application of statistical methods showed that there are differences between the measurements taken after the application of the set of games, which allows affirming the positive effect on the motivation towards physical activity in older adults.

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Authors' contribution:

Milagros La Rosa Arias: Conception of the idea, instrument application, compilation of information resulting from the instruments applied, análisis estadístico, drafting of the original (first version), review and final version of the article.

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Odalís Martínez González: Literature search and review, statistic analysis, database preparation, drafting of the original (first version), article correction.

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