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Orientation walking, a way to improve cognitive functions in the elderly

Marcha de orientación, una vía para mejorar las funciones cognitivas en el adulto mayor

Caminhada de orientação, uma forma de melhorar as funções cognitivas em idosos

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ABSTRACT

The usefulness of physical recreation with a playful character for the elderly is a fundamental means to improve their health, their cognitive functions and their quality of life. Based on a diagnosis, it was possible to identify the insufficiencies in memory events in this age group. It was also found that the physical-recreational activities proposed for this age group in the community are very general, little varied and do not take into account their



morpho-functional characteristics. The objective of this research is to improve the cognitive reserve of elderly in the community of " Matahambre " in the municipality of Songo la Maya through orientation walking. Theoretical methods such as analytical-synthetic and inductive-deductive were used to solve the objective. Among the empirical methods, documentary analysis, observation, survey and interview were used to obtain the necessary data and information for the correct implementation of the orientation walk, taking into account the characteristics of this population group. The proposal demonstrated that the orientation walk was an important tool for the stimulation of the capacities and memories of these people, from their likes, preferences, needs and interests and made it attractive to them and even allowed them to remember vital aspects or emotions of their personal life.

Keywords: physical-recreational activities, orientation walking, cognitive functions

RESUMEN

La utilidad de la recreación física con carácter lúdico para el adulto mayor resulta un medio fundamental para mejorar su salud, sus funciones cognitivas y su calidad de vida. A partir de un diagnóstico aplicado, se pudieron conocer las insuficiencias en eventos memorísticos de este grupo etario, se comprobó que la propuesta de actividades físico-recreativas dirigidas a la comunidad fueron muy generales, poco variadas y no atendieron a sus características morfofuncionales. La presente investigación tuvo como objetivo mejorar la reserva cognitiva en los adultos mayores de la comunidad "Matahambre" del municipio Songo la Maya, a través de la marcha de orientación. Para la solución del objetivo trazado se emplearon métodos teóricos como el analítico-sintético e inductivo-deductivo. Dentro de los métodos empíricos: el análisis documental, la observación, la encuesta y la entrevista permitieron obtener los datos e informaciones necesarias para la correcta realización de la marcha de orientación, al tomar en cuenta las características de este grupo poblacional. La propuesta demostró que la marcha de orientación fue una importante herramienta para la estimulación de las capacidades y recuerdos de estas personas, desde sus gustos, preferencias, necesidades e intereses y lograr que les resultara atractiva e incluso les permitió recordar aspectos o emociones vitales de su vida personal.



Palabra claves: actividades físico-recreativas, marcha de orientación, funciones cognitivas

RESUMO

A utilidade da recreação física de carácter recreativo para os idosos é um meio fundamental para melhorar a sua saúde, as suas funções cognitivas e a sua qualidade de vida. A partir de um diagnóstico aplicado foi possível conhecer as insuficiências nos acontecimentos de memória desta faixa etária, comprovou-se que as propostas de atividades físico-recreativas dirigidas à comunidade eram muito gerais, pouco variadas e não levavam em conta a sua morfologia. características funcionais. O objetivo desta investigação foi melhorar a reserva cognitiva em idosos da comunidade "Matahambre" do município de Songo la Maya, através da caminhada de orientação. Para resolver o objetivo declarado, foram utilizados métodos teóricos como métodos analítico-sintéticos e indutivo-dedutivos. Dentro dos métodos empíricos: a análise documental, a observação, o inquérito e a entrevista permitiram obter os dados e informações necessários à correta implementação da marcha de orientação, tendo em conta as características deste grupo populacional. A proposta demonstrou que a caminhada de orientação foi uma ferramenta importante para estimular as habilidades e memórias dessas pessoas, com base em seus gostos, preferências, necessidades e interesses e torná-la atrativa para elas e até permitir que elas relembrem aspectos vitais ou emoções de sua vida pessoal.

Palavras-chave: atividades físico-recreativas, caminhada de orientação, funções cognitivas

INTRODUCTION

Recreation has acquired a social and educational value both from the individual and collective point of view, it increasingly exposes the benefits it represents for improving the health of all and is considered not as a luxury but a necessity that has spread throughout the world. the world to prevent diseases, improve overall health, develop physical abilities, promote moral values, unite communities and enhance the quality of life of human beings (Quintana et al., 2021).



Recreation promotes the development of different motor skills, interacting with the environment in active play both individually and in groups; improves body perception, control of one's own movements, location in time and space; develops coordination, balance; and contributes to lower levels of stress, distress and/or anxiety.

Therefore, it serves the human being not only to activate the body but also to maintain a healthy balance in the mind. At the same time, it helps to learn to live with others and therefore has a significant function in social education, favoring the creation of a lifestyle in the population that benefits man in his physical capacity, in health, in the economy, in the levels of communication and in human development; essential factors in local development (Fuentes and Bestard, 2021).

It is also a way to combat boredom, to overcome leisure time, to release tensions, to understand and comprehend the social reality in which the subject is immersed; one of these ways to meet the recreational needs of human beings is physical recreation.

In recent years, physical recreation has acquired essential importance for any society, based on its potential for human development and enrichment, which affects the quality of life of the population in general. In this sense, in addition to being a pleasurable activity, it also serves as a means to develop knowledge, skills, habits, qualities and provoke emotions, so that the formation of personality becomes a happy experience.

Today, it has become an inexhaustible source for improving the quality of life of the Cuban population, with scientifically measured programs that guarantee the physical and spiritual needs of the great masses, specifically in the popular councils in both urban and rural areas.

The process of physical recreation is essentially designed to encompass all population groups in society, although in Cuban reality it is given greater weight to children, youth and adults and to a lesser extent to the elderly, who are cared for through physical culture programs. This requires the latter to be attended to through physical recreation, since the demographic trend shows its constant growth in Cuba. Since the end of 2013, the nation was one of the most aged countries in Latin America, with 19% of its population in this group,



and the social challenge that this represents is to meet the needs that it generates from the economic, biomedical and social point of view.

For this reason, policies and methods with medical-social projections have been established that allow these people to feel more useful to their family and society. In this sense, physical recreation is a pillar for achieving old age with adequate health, since it positively compensates for muscle mass, favors respiratory dynamics, temperature, blood volume and improves peripheral resistance and the ability to respond to stress.

This progressive increase in life expectancy presents for the next decades the important challenge of defining the meaning and social roles of older adults (Mosqueda, 2022); a challenge that implies the need to make social adjustments that allow them to develop all their potential, in search of aging with quality of life; therefore, for older adults, a more rational education is provided, linked to better living conditions, which makes them more sensitive in the search for a new art of living.

As people age, they are more susceptible to certain diseases, especially chronic degenerative diseases such as arthritis, osteoporosis, cardiovascular diseases, memory loss and obesity, among others. In many cases, these diseases cause disabilities that affect the individual's life.

Physical-recreational activities help older adults enhance their creativity, feel useful, raise self-esteem, enjoy new interests, promote interpersonal relationships, well-being, satisfaction, as well as maintain cognitive and psychomotor skills (Aguilar, *et al.*, 2020).

Currently, numerous actions are promoted in favor of the study and care of the elderly (Aguilar *et al.*, 2021 ; Araque *et al.*, 2021 ; Herrera *et al.*, 2023; Villarreal *et al.*, 2021) that point towards medical, demographic or psychological objectives, but there is still insufficient work on the importance of contributing to the search for other ways to enrich care for the elderly, from a social perspective, where the quality of their life is improved, through exchange, socialization, healthy entertainment and recreation, among other aspects.



Based on this bibliographic background and the application of various diagnostic instruments, the existence of deficiencies in care of the elderly of the "Matahambre" community of the Songo la Maya municipality was confirmed., which are realized in:

- Limited variety of recreational offerings for this population group that do not take into account their likes, preferences or morphofunctional characteristics.
- Inadequate orientation of physical -recreational activities aimed at improving memory in older adults, in order to improve their quality of life.
- Few physical-recreational activities are carried out aimed at improving the cognitive reserve of the elderly.

Consequently, the objective was to improve cognitive reserve in the elderly of the "Matahambre" community in the Songo la Maya municipality, through orientation walking.

MATERIALS AND METHODS

The type of study was explanatory and of a non-experimental, descriptive, cross-sectional design with a group. The population was 65 older adults and an intentional sample of 19 was chosen, who were integrated into the circle of grandparents "Raíces de Cagüairán", for 29% of the general population (350 inhabitants in total). The sample was made up of retired older adults that presented pathologies such as arterial hypertension, memory and concentration failures, osteoarthritis and asthma.

The intentionality of the sample was determined by:

- Females (12) and males (7) between the ages of 65 and 75, who reported memory lapses.
- Voluntary participation in research.
- The joy of walking.
- Not presenting symptoms or neurological alterations that make it difficult to carry out the research.



- No history of alcoholism or drug abuse.

In order to develop this proposal, it was necessary to use a set of research methods and techniques. At the theoretical level, the following can be mentioned:

Analytical-synthetic: to theoretically base the research, it was started from intellectual operations, breaking down and joining parts of the research complex and collecting data and information found in the consulted bibliography; from the main criteria of the authors on the subject, the main contributions and limitations were revealed, in order to systematize the proposal to improve cognitive reserve in older adults in the community.

Inductive-deductive: to establish the general and specific reasoning of the process of physical recreation in the community and orientation walking for older adults with the aim of improving their cognitive reserve.

At the empirical level, the following are worth highlighting:

Document analysis: to determine the main difficulties that were manifested in the recreation process from the community perspective. The documentation related to the Strategic Planning of the National Institute of Sport and Recreation (INDER) was analyzed. A review was made of the programs, demands and needs of INDER related to the care of the elderly and the necessary analyses to face this challenge.

Class observation: to find out under what conditions the classes were taught, the number of grandparents who attended and whether, in addition to physical exercises, physical-recreational activities were carried out, aimed at the morpho-functional needs and interests of the elderly.

Survey of teachers and elderly in the circle of grandparents: with the aim of identifying deficiencies in morphofunctional attention, memory failures and the frequency of these deficiencies in the cognitive memory of the elderly.



Group interview with older adults: to understand the willingness of this age group to engage in physical and recreational activities in their free time, and their likes and recreational preferences.

Descriptive mathematical statistical method: the percentage calculation allowed to process and analyze the different instruments used to know the likes and preferences about the physical-recreational activities carried out in the community and those that are preferred. The data processing carried out brought the researchers closer to the evaluative indicators that measured the improvement of the cognitive reserve, based on the application of orientation walking as a recreational and novel form implemented in this community.

RESULTS AND DISCUSSION

Analysis of the results of the scientific observation carried out in the classes of the Grandparents' Circle "Raíces de Cagüairán".

Five classes were observed to find out under what conditions they were taught, the number of grandparents who attended and whether, in addition to physical exercises, physical-recreational activities were carried out aimed at stimulating the cognitive functions of the elderly.

It was found that the Physical Education teacher motivated them to do the exercises in class, there was little participation in the circle of grandparents, especially among men, taking into account the elderly population of the community. Different types of physical exercises were worked on, but few recreational activities that would allow for greater participation, almost none aimed at stimulating cognitive functions and there was not always research into what recreational activities to develop with this population group aimed at this end.



In the group interview, it was known that the physical activities of the Grandparents' Circle were predominantly exercises for addressing physical pathologies and strengthening muscles, which were carried out twice a week, with no other type of recreational activity intended to stimulate cognitive functions being conceived during class.

When surveying the teachers of the Circle of Grandparents, they agreed that they are unaware of various recreational activities for stimulating the cognitive functions of the elderly, and they recognized the value that adapted orientation walking brings to improve their quality of life in the family and the community.

In surveys of older adults, it was found that although recreational activities were carried out, the likes and preferences of the participants were not always taken into account, these were repeated regularly and there were no initiatives aimed at stimulating cognitive functions, such as, for example, through orientation walking.

The analysis of documents allowed to determine the main difficulties that occur in the recreation process from the community perspective: the difficulties in planning recreational activities aimed at stimulating the cognitive functions of this age group, based on orientation walking, and adapting the demands and needs established by INDER, related to care for the elderly, to the community context.

After analyzing the results and assuming that it is necessary for the elderly to have fun in order to improve their quality of life by stimulating their cognitive functions, physical-recreational activities were developed to achieve their incorporation, especially those related to orientation walking. The intention was to take into account the likes and interests of this community as a basis to provide the necessary ways to improve their quality of life. The general purpose was to enhance the sociability of the elderly and stimulate their cognitive functions by seeking to raise the level of physical and psychological autonomy to improve their quality of life.



In older adults, there is a deterioration in the capacity for physical coordination, which considerably affects their daily physical and motor performance, a decrease in strength, cognitive skills, endurance and flexibility, stride length and unbalanced motor skills that mark disorders in physical coordination and lead to falls or a sedentary lifestyle due to fear of suffering one of them. Added to this is the deterioration in brain functions that cause various syndromes that have been given the collective name of dementia. The functions that may be affected are memory, thinking, recognition, language, planning and personality. (Aguilar et al., 2021).

The normal aging process is accompanied by a decrease in physical function, mobility and endurance, leading to varying degrees of loss of independence. Studies by Aguilera et al. (2020); Mosqueda (2022) indicate that a balanced and planned program should include activities aimed at achieving each of the three objectives of good physical coordination, namely increasing flexibility, increasing strength and increasing cardiovascular endurance.

In an analysis carried out by Toledo et al. (2020), it is stated that joint mobility is one of the components that most influences gait alterations and the risk of falls. This is one of the causes of the highest morbidity and mortality in people over 65 years of age. These arguments served as the basis for structuring the physical exercises that make up the proposed methodological alternative to improve the orientation walk of these older adults.

Training for the stimulation of cognitive functions in the elderly, through orientation walking

Orienteering walk meets the needs of improving the cognitive functions of older adults. The coordinated, interrelated and comprehensive planning of orienteering sports, with a systemic character, constitutes one of the contemporary contributions of pedagogy in the sports sector.

Therefore, the attention to orienteering sports, as activities that contribute to the healthy occupation of free time, must respond to a closely related and articulated planning, in such a way that allows its effective realization. Orientation is the act of placing an object or a



person in a certain position with respect to the cardinal points and finding the right direction to reach the intended site (Tamayo et al., 2022).

Orientation is a content that raises spatial preparation, decision making, knowledge of a symbolic language, as well as cognitive involvement to another level; it appears as an alternative where physical and mental effort are perfectly combined, older adults can move on foot or by any means of transport, they can go alone, in the company of a group of friends or family and test their cognitive functions to locate themselves in the place where they are and recognize where they are going. When moving, they must follow the clues and signs that indicate the route to follow and in this way they discover new places. Without a doubt, it is an activity to work on their cognitive cultural development.

Orienteering walk can be considered a recreational activity that has the following properties:

- Provides physical effort.
- It involves overcoming a certain challenge in a certain way, depending on the time and distance to be covered.
- It is necessary for the participant to acquire mastery of orientation techniques.

The orienteering walk consists of moving along a route, according to the meaning of the clues that are found during the walk and that indicate the conduct to be followed by the grandparents at each moment, until reaching the goal. The intensity of the movement is in accordance with the physical conditions and the ability to constantly observe, so as not to lose any clues and deviate from the correct direction. It is an individual event against the clock; the departure time between one participant and the next can vary between one and five minutes, as stipulated by the organizers of the walk.

This activity has no age limit or material complications. It is a cultural physical activity that places the participant in any terrain to follow a previously established route, with no other means than a card to write down the clues and signs they find.



It is suitable for its teaching-learning:

- Make known the signs that are used. Signs can be artificial or voluntary (left by man or animal on the path he/it is travelling on); natural or involuntary (agreed upon in advance and placed by man along his path in the places where he wants to show the path he has followed).
- Conduct small practices and competitions.
- Show all the shapes that can be used to make the signals.

Orientation walking allows the activation of memory, which, according to Toledo *et al.* (2020), is a process by which information is encoded, stored and retrieved. It is a cognitive process by which the information collected can be encoded, stored and finally retrieved when needed.

Memory consists of several phases, according to Quintana *et al.* (2021):

- Coding: in this phase the information coming from the different sensory channels is processed and represented in the memory system.
- Retention: is the phase in which the information represented in memory takes a place in sensory memory, short-term memory or long-term memory, so that this information can be recalled and used immediately or later.
- Retrieval: this phase allows access and recall of information previously stored during the retention phase.

According to Jarque *et al.* (2022), low brain performance, as a consequence of the loss of neurons due to age, can be reversed with training to reestablish neural connections or produce new ones and establish new paths for the arrival of information to our cerebral cortex where activities such as memory are processed.

As part of the analysis, it was found that the physical-recreational activities carried out did not take into account the deficiencies presented in the memory of this age group, aimed at improving cognitive reserve; the different instruments applied allowed to make known their likes and preferences regarding physical-recreational activities; and the evaluative



indicators that emerged from the data processing carried out allowed to compare the improvement of cognitive reserve, based on the application of orientation walking as a recreational and novel form implemented in this community.

La Rosa et al. (2021) emphasize that training cognitive functions allows the stimulation of memory processes, through structured exercises and situations with increasing difficulty adapted to the cognitive abilities of each individual, in order to improve them, including those abilities in the process of degeneration. This approach led to verifying and testing the main objective set out in the research.

For cognitive stimulation of the elderly, it was considered efficient to carry out the following prior activities (Villareal *et al.*, 2021):

- Perform simple tasks that helped mental activation.
- Work on temporal, spatial and personal orientation so that the older adult can locate themselves at all times and know where they are and who or what is around them.
- Exercises to stimulate memory. In the short term, repetition games were used to stimulate memory; also, remote memory was used to recall past events, places visited, descriptions of the city, location of hospitals, schools, hotels, their home, parks and historical centers.
- The exercises on calculating distances with respect to reference points were ideal for reinforcing memory.
- Basic reasoning was used.
- Setting benchmarks was very helpful at this time, by encouraging reading, dictation, and journaling.

Methodological planning of the orientation walk for the elderly. With the development of this orientation walk, the aim was to promote the value of self-esteem, solidarity, mutual help, companionship, camaraderie, goodwill, friendship, through interpersonal relationships, to share moments of joy and pleasure and reduce the stress caused by daily activities.



With this physical-recreational activity linked to the social and natural environment, there was the opportunity to carry out tasks full of experiences, educational values that made it constructive and achieved a closer relationship with the natural environment, a knowledge and understanding of it and identification and love for nature. This opinion is shared by Fuentes *et al.* (2021) who also consider that the methodological planning of orientation walking in the elderly enables their socialization with the social and physical environment of the community where they live.

The orienteering walk was carried out over a distance of 200 metres, always and when it was authorized by the family doctor. 14 lanes were used in the route, which was designed taking into account the pathologies of the participants and the characteristics of the terrain.

Methodological indications:

The orientation walk, as a recreational activity, had its own adaptations, as it was aimed at older adults. It was carried out in two moments:

1. Explain what orienteering walk involves, the types of trails that can be used, the rules for its layout, and the benefits that this type of activity provides to older adults.

The following were taken into account for teaching-learning:

- Make known the signs used.
- Conduct small practices and competitions.
- Show all the shapes that can be used to make the signals.

2. The tour was carried out in pairs, the time left for each pair was 5 minutes. They walked at their normal pace and the pair that found the most clues and identified the trees and animals found won.

Means used: cards and pencils.

Organization of the activity



- A survey of the site was carried out and found to be no danger to this age group.
- The land featured landmarks such as: cinemas, shops, monuments, trees, parks, offices.
- A sketch of the route was made.
- Topographic symbols were studied.
- It was located on an enlarged map of the area.
- All the necessary signs were made along the way.
- Written messages were prepared for each team and included in their envelopes, according to the number of participants.
- The signs were made out of cardboard.
- The competitor cards were designed in a practical way.
- The teams were drawn by lot, as were the individual tests.
- The departure time depended on the number of teams, but was never more than 10 minutes between each departure.
- The departure and arrival times were recorded at the main point.
- Audible signals were used, with the knowledge of the participants, and they were also informed that they could emit them in case of an accident, fall or disorientation.
- A first aid kit was made available.

Rules for its layout:

1. The marks were made on the ground, with the tip of a knife, branch or stone, with sticks, marks with chalk or crayon.
2. The tracks or signs were placed less than a meter high.
3. It was usually drawn to the right of the road.
4. They had to be visible and not attract the attention of strangers.
5. The placement of the last sign was remembered exactly, in order to maintain the direction and find the correct placement of the next one.
6. The distance between signals depended on the nature of the terrain such as: difficult to observe terrain: 4 to 5 meters.
7. In rocky places: 8 to 10 meters.



8. In areas with trees: 20 to 25 meters.
9. In open terrain: 30 meters or more.
10. The signs were approximately 10-15 centimeters in size.

Rules for tracking:

1. The signs found were noted on the corresponding card.
2. The step was moderate, since if the intensity is greater than its observation capacity, some of the signs or clues are omitted.
3. The last person to pass erased and destroyed the signs, and also collected the messages and objects placed there. In this case, it was an organizer of the activity that was out of the competition.

Organization methodology:

- It was recommended that the practitioner adopt his stride, be relaxed, comfortable, and calculate the length of his step.
- The terrain was examined to ensure that it did not have swamps, ravines or ditches.
- All possible signs were made along the route to avoid accidents.
- The signs and clues that were made on cardboard were legible.
- The departure was by drawing lots.
- The departure time depended on the number of teams, never more than 10 each.
- The starting signal may be audible, but everyone should know it.
- The participant card was designed in a practical way.
- Two men and two women from each team competed.

Assessment:

Once the tour was finished, the clues found by the elderly person were counted and marked on the card and multiplied by four points. The time spent on the tour was multiplied by two points and subtracted from the total number of points for the clues. Then, if the participant found false clues, they were multiplied by eight points and subtracted from the total number of points, and this was the result.



True clues found or good clues: were those that were placed on the ground and the older adult marked them on their card.

False clues found or bad clues: those that the older adult marked on his card that do not exist on the land.

Formula:

Pis . $V \times 4$ (true clues or good clues)

Pis . $F \times 8$ (false clues or bad clues)

$T \times 2$ (time)

T. Pts = (total points as final result)

Formula: T. Pts = $(PV \times 4) (PF \times 8) (R \times 2) =$ Final result.

The one with the highest result obtained won. The results obtained in this study coincide with those carried out by Villareal *et al.* (2021) who considered it necessary to cognitively stimulate the memory of the elderly with simple prior activities that make their subsequent memory orientation more efficient.

CONCLUSIONS

The bibliographical references allowed to theoretically substantiate the benefits that physical-recreational activities bring to the increase in the quality of life of this population group, especially, orientation walking as a way to improve the cognitive reserve in the elderly of the "Matahambre" community of the Songo la Maya municipality.

The application of research instruments provided the necessary elements to confirm the existence of the problem raised, which demonstrated the low participation of the elderly in physical-recreational activities aimed at stimulating cognitive functions in this community.



The orienteering walk offered this age group the opportunity to profitably occupy their free time, stimulate their cognitive reserves and achieve socialization with other people in their environment who suffer from similar deficiencies.

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Conflict of interest statement:

The author declares that there are no conflicts of interest.

Author's contribution:

The author is responsible for writing the work and analyzing the documents.



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