

The bio-healthy gym: a way to improve joint mobility in the older adult

Abstract

Aging is a process in which structural and functional changes occur, one of the consequences of which is the loss of joint mobility. The excessive decrease in joint mobility may cause the older adult to be unable to perform activities of daily living on his or her own. The work addresses a topic related to the incorporation of traditional therapeutic exercises in a population group of older adults to try to improve their joint mobility. It is still insufficient the methodological treatment to apply traditional therapeutic exercises in the physical activity program for the elderly in Cuba. This work proposes to elaborate a methodological alternative to favor the articular mobility of the elderly through therapeutic exercises with the use of bio-healthy gyms. The methodological alternative contains adaptations and orientations to herapeutic exercises according to the possibilities of the elderly to favor their articular mobility. Evaluated as very adequate by 91.6% of the specialists in the nominal group. The application of statistical methods corroborated the existence of differences between the measurements in 88% of the cases studied, which allows affirming the positive effect of the practice of therapeutic physical exercises with the use of bio-healthy gyms in slowing down deterioration. The normal aging process and a discrete improvement in the quantitative parameters evaluated were observed.

Keywords: aging, joint mobility, bio-healthy gymnasium

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Introduction

The 20th century was characterized by a great scientific-technical development combined with low fertility and birth rates and a decrease in communicable diseases, resulting in an increase in the life expectancy of the world population and an increase in the number of people over 60 years of age.¹

This aging population has become one of the most important challenges for today's society. Worldwide, the geriatric population is growing in number, composition and cultural level.^{2,3} Longevity is producing unprecedented changes in policy makers, in general, and citizens, in particular, as social and economic security levels and health service offers must be maintained for a segment of the population, who, due to their advanced age, are at a disadvantage to face the social demands of contemporaneity.

In old age, anatomical and physiological changes occur in all organs and systems of the human body, which, together with a series of socioeconomic and cultural factors and inadequate lifestyles, have an impact on the deterioration of the quality of life of the elderly.

Among the factors that accelerate aging in today's society, the most relevant are excessive diet, stress, hypertension, smoking and alcoholism, and the two factors that are considered to inexorably influence this process:

- A. Loneliness or lack of participation.
- B. Sedentary lifestyle or little physical activity.

In order to slow down aging, among other activities, continuous physical exercise and social and occupational participation is recommended.¹⁻⁷

As one ages, physical fitness weakens, due not only to biological aging but also to a person's adjustment to a lower level of activity. Changes in the regulation of balance, posture and movement are highly individual; moving slowly weakens motor coordination.

The onset of old age has both a physical and psychological impact on people, affecting the joints, blood pressure, circulation, among other pathologies, causing pain, dependence and low self-esteem.⁷⁻⁹

Therefore, it is recommended by specialists to exercise the parts of the body to avoid accelerated aging and wear of the joints, being more beneficial if it is done in a natural area or outdoors. For this purpose, associations have been created for the elderly that provide simple exercises that generate movement in the different parts of the body. Nowadays, there are many people in the world who dedicate their efforts and studies to what could be called the new culture of longevity. However, sometimes this desire is hindered by the lack of adequate spaces for its execution. It is necessary, therefore, to extend sports facilities, and that by doing so, older people can be influenced and positively motivated to participate regularly in physical activity programs.

Among the offers increased by INDER in the Cuban community are the bio-healthy gyms, which were introduced in Cuba in 2008, and are an alternative of great acceptance among the population due to their easy access, which allows the influx of beneficiaries with an appropriate interaction with the environment, and the established schedule allows the working population to join. Also known as geriatric parks or gardens. In Cuba, these gyms were located in sports areas and open-air spaces to facilitate access by the population.

The bio-healthy gyms include 11 pieces of equipment, in order to implement a greater number of participants and guarantee access to people of all ages. In this sense, the activities that can be developed in the gyms, for prophylactic and therapeutic purposes, become an answer to the current social demand to improve the quality of life of the population, with special emphasis on the most vulnerable groups.

The bio-healthy gyms have an attractive module of means to exercise, safe, comfortable and resistant, its design allows working on the toning and strengthening of different muscle planes, at different angles and positions, besides being able to be used some of them for more than one beneficiary.

Bio-healthy gyms have become an educational space for the population since they develop a set of health promotion actions that emphasize prevention, through the implementation of physical sports and recreational activity programs that delay or prevent the onset of chronic non-communicable diseases and their sequelae. In this sense, the activities with prophylactic and therapeutic purposes, become a response to the current social demand to raise the quality of life of the population, with special emphasis on the most vulnerable groups, including the elderly.

The work in bio-healthy gyms requires the necessary application of good practices and advanced ideas, leading to a systematic, scientific and pedagogically organized process, based on well updated theoretical and methodological arguments.

In order to maintain or improve the physical condition of people who are starting out, a diagnostic study is an indispensable condition to know the psychological needs of each of the people who join the teaching and follow-up process provided by these gyms. However, to obtain significant achievements in this work, it is required the permanent updating and training of teachers in order to be able to characterize the physical development from the morpho-functional point of view, by means of test batteries, which guarantee to be able to conceive an adequate planning system and direct the application of loads with the scientific rigor demanded by the applied sciences at present.

As a sample of the above, it was proved that community social work can be considered as a form of practical intervention for the improvement of the quality of life of the elderly in Cuban urban communities and that it is not always taken advantage of by therapists, rehabilitators and doctors in charge. From the diagnosis carried out in the Nuevo Holguín neighborhood of Holguín municipality, where methods such as observation, survey and document review were applied, a group of irregularities were identified that hinder the incorporation of this age group to the physical practice of exercises in these bio-healthy gyms. They can be mentioned:

1. In the methodological indications, 11 and for the 20172018 course, in relation to the bio-healthy gyms, the use by people over 60 years of age is not allowed.
2. Insufficient contextualization of the action protocol aimed at the physical rehabilitation of the elderly with the use of bio-healthy gyms.
3. Limited theoretical and methodological preparation of physical culture teachers, rehabilitators and physiotherapists to develop the rehabilitation process of the elderly with the use of bio-healthy gyms. Exercises are scarce and free-handed, they do not solve the problems of articular mobility of these people.
4. Lack of methodological platform for the rehabilitation of the elderly with the use of bio-healthy gyms.

Hence, the following problem to solve arises: how to contribute to the improvement of joint mobility in the elderly from the use of these gyms?

The objective of this article is to elaborate an alternative of physical exercises in bio-healthy gyms for the rehabilitation of joint mobility in older adults in this Cuban community.

It is specified as field of action: rehabilitation of articular mobility in the elderly in the Reparto Nuevo Holguín.

Materials and methods

For the realization of the research, a descriptive, prospective, cross-sectional study was carried out in older adults over 65 years of age belonging to the circle of grandparents of the Reparto Nuevo Holguín, during the period from January 2021 to February 2022. It was developed with a population of 18 older adults over 65 years of age belonging to the aforementioned circle of grandparents. A sample of 10 older adults was selected from them, using simple random sampling.

Theoretical and empirical methods were also used, among which the following can be mentioned.

Theoretical methods

Logical history: it is used to assess the evolution and development of the application of therapeutic physical exercises with the use of biodegradable gyms by older adults to improve joint mobility, allowing the search for the arguments that preceded the problem addressed.

Analysis - synthesis: during the research it will have the objective of interpreting the information obtained and determining the proposal of exercises and the elaboration of the report by processing the information, both theoretical and empirical, to characterize the object of research, determine the theoretical - methodological foundations.

Induction - deduction: made it possible to make inferences and generalizations about the process of therapeutic physical care of older adults for the use of bio-healthy gyms, as well as its particular elements in the local context studied.

Empirical methods

Observation: it allowed obtaining data and information about the use of the bio-healthy gyms in the improvement of joint mobility in older adults.

Survey: addressed to the practitioners to know their opinion about the importance of physical exercises with the use of the bio-healthy gyms.

Interview: addressed to the teachers of this group to find out the type of physical exercises they teach their students and whether or not they take into account the use of the biohealthy gym to improve or maintain joint mobility in their students.

Document review: allows consultation of the documents that govern the physical rehabilitation process in older adults.

A diagnosis was made in order to know the behavior of the articular mobility of the sample during the classes given by the elderly care teacher and the rehabilitator. Difficulties were observed in the performance of various exercises involving the articular mobility of the shoulder and, consequently, in the performance of home activities involving the execution of the shoulder joint. Subsequently, a physical intervention plan is elaborated and applied with therapeutic exercises involving shoulder joint mobility to again diagnose and evaluate its effectiveness, taking into account the physical, psychological and social characteristics of the older adults in the sample.

Results and discussion

In the older adult, there is a deterioration of the capacity for physical coordination, which has a considerable impact on their physical performance, affecting daily motor performance, decreasing strength, endurance and flexibility, reduction of the length of the gait and

unbalanced motor skills that mark disorders in physical coordination and lead to the presentation of falls or sedentary lifestyle due to the fear of suffering one of them. The normal aging process is accompanied by decreases in: physical function, mobility and endurance, leading to varying degrees of loss of independence. Therefore, the studies by Rivera,¹² and Álvarez and Alud,¹³ indicate that a balanced and planned program should include activities aimed at achieving each of the three objectives of good physical coordination: increasing flexibility, increasing strength and increasing cardiovascular endurance. In an analysis carried out by La Rosa,¹⁴ it is referred that joint mobility is one of the components that most influences gait alterations and the risk of falls, which are one of the causes of greater morbidity and mortality in people over 65 years of age. These arguments served as a basis for the structuring of the physical exercises that integrate the methodological alternative proposed to improve joint mobility in these older adults.

The methodological alternative considered that physical therapy plays a fundamental role in the management of osteoarthritis and its objectives are to reduce pain and joint stiffness, maintain and promote muscle strength and trophism, and improve joint mobility and biomechanics. The proposed exercises have proven to be beneficial in pain control and functionality of the shoulder, knee and hip with osteoarthritis. All the exercises that help to strengthen the periarticular

muscles have proven to be useful. It is important to the patient engage in some type of physical activity, as it is known that osteoarthritis predisposes, because of pain, to less exercise.¹⁵

Methodological alternative for performing physical exercises to improve joint mobility with the use of bio-healthy gyms.

General objective: to develop a methodological alternative to implement a physical exercise plan to improve joint mobility in elderly patients using bio-healthy gyms.

For the elaboration of the therapeutic physical exercises, there are 3 stages: diagnosis, planning and elaboration of the therapeutic physical exercises to be developed, implementation of the exercises and evaluation.

Stage 1: Diagnosis

Identifies the real state of the object and the problem in which the alternative is developed and realized is evident

Stage 2: Planning and elaboration

The Table 1 Shows some of the exercises that can be performed on the equipment that make up the bio-healthy gyms and the work aimed at the older adult's joints that need to be strengthened and improved.

Table 1 Alternative physical exercises to improve joint mobility with the use of bio-healthy gyms

| Apparatus | Achievements of the execution of the apparatus | levels repetitions by | | | Frequencies |
|-------------------------|---|-----------------------|----|-----|----------------|
| | | I | II | III | |
| Steering wheel and bars | | 6 | 8 | 10 | 3 times a week |
| Pony and Elevator | Strengthens the muscles of the arms, shoulders, waist and chest. | 4 | 6 | 8 | 3 times a week |
| Surf | Allows the development of Improved shoulder joint flexibility and horse | 3 los | 6 | 9 | 3 times a week |

Stage 3: Implementation

Implementation of exercise classes with the use of equipment in the bio-healthy gymnasium.

Stage 4: Evaluation

Evaluation of the activities planned in the alternative for the physical exercises; an evaluation system is used to determine how the participants improve their physical condition. This stage favors determining the effectiveness of its application.

This methodological alternative for the improvement of shoulder joint mobility in the elderly of the grandparents' circle of Reparto Nuevo Holguín was applied for 6 months.

The results of the diagnosis carried out show the existence of methodological and practical inadequacies that hinder the physical rehabilitation process of the elderly for the improvement of joint mobility with the use of bio-healthy gyms.

The methodological alternative elaborated is easy to understand and can be applied both by the personnel working in the rehabilitation services of the Ministry of Public Health and by the community physical culture teachers belonging to the sports teams.

The results of the nominal group and the partial application in practice show that the methodological alternative is pertinent and contributed significantly to the physical rehabilitation of the elderly for the improvement of joint mobility with the use of the bio-healthy gyms.

Conclusion

1. The theoretical and methodological foundations systematized during the research process show the importance of physical rehabilitation of the elderly for the improvement of joint mobility with the use of bio-healthy gyms.
2. The results of the diagnosis carried out show the existence of methodological and practical inadequacies that hinder the physical rehabilitation process of the elderly for the improvement of joint mobility with the use of bio-healthy gyms.
3. The physical-therapeutic alternative elaborated is structured in two components, one theoretical and the other methodological, which complement each other and are an ideal vehicle to develop the rehabilitation process in the elderly for the improvement of joint mobility with the use of bio-healthy gyms.

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Conflicts of interest

Author declare there are no conflicts of interest.

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