

# ***Exercises for the physical condition of older adults at home during the Covid-19 pandemic***

## ***Abstract***

*The COVID-19 pandemic has generated social distancing and confinement, which has caused, among other consequences, a decrease in the practice of physical activity (PA) and sports in the entire population. One of the most affected groups are the elderly, so it is necessary to search for alternatives to maintain their skills and physical abilities in this period. In this way, the present investigation defines as an objective: to assess the results of the application of exercises adapted to the home context during COVID19 to maintain the physical condition of older adults. Twelve older adults with an average of 68 years of age participated in the research. In the investigative process, scientific methods were used, at the theoretical level, the empirical and mathematical statistics to determine the empirical distribution of frequencies in the analysis of the specialists' criteria. The solution proposal is made up of 36 exercises adapted to the home context that respond to the characteristics and needs of the population studied, allowing the proposed goal to be achieved, in addition, they are considered very appropriate and of great social utility by specialists.*

***Keywords:*** *physical condition, adapted exercises, home, older adult, Covid*

## **Introduction**

Currently in Cuba, the Circles of Grandparents become a space for the participation of the elderly in physical activities, which have the cooperative work of professionals in medicine, nursing and Physical Culture. (Hernández, Sánchez and Rodríguez, 2021)

Physical fitness has implications for the quality of life of older adults (Middleton et al., 2020) because it is a risk factor for disability and for maintaining an independent lifestyle. (Badilla et al., 2017)

The functional physical condition is of vital importance for the quality of life of people. Functional fitness is considered to have 5 main components, which are: body composition, muscular strength, cardiorespiratory endurance, flexibility, and balance.

The beneficial effects of regular physical activity on people's health are well established by authors such as Jiménez, Carbonell and Lavie (2020); Ortiz and Villamil (2020); Quesada (2020) who identify them with the improvement of physical and physiological

health, with positive results in mental health, well-being and resilience, maintaining stable levels of physical and psychological health.

Due to the current epidemiological situation, it is necessary to replace the physical activities in the open air carried out in the Circles of Grandparents, with physical activity and training at home, according to the health condition and the level of conditioning of each practitioner, since the interruption of the systematic practice of physical activities can cause physical deconditioning, which implies the decrease or loss of the levels of adaptation to physical loads, as well as the decrease in the physical condition achieved.

## **Materials and methods**

A quasi-experimental study was carried out, with a group made up of older adults from the "Alegrías de Vivir" grandparents' circle of the "Mártires de Barbados" Sports Complex, whose population is made up of 15 subjects, of which 12 participated in the research. The inclusion criteria were: to be enrolled in the Circle of Grandparents, that they did not present acute respiratory diseases and that they agreed to participate in the study, for which they signed the informed consent.

The study population is female (100%). The average age is 68 years, the most common marital status is being married or living in a free union with 64%, and the most frequent level of schooling is upper secondary education with 67%.

For the development of the research, we work with a second population made up of the eight specialists selected in order to evaluate the exercise proposal, which met the selection criteria.

### **The study was developed through three phases:**

During **the initial diagnostic phase**, the measurements shown were made in October 2020 after the first period of confinement, which serve as a starting point for carrying out

the work. Within the studied indicators of physical condition are: body weight and height to determine the Body Mass Index (BMI) that was calculated by the formula:

$BMI = \text{Weight} / \text{Height}^2$ . In addition, the tests that make up the battery established in the Program for the Elderly for the evaluation of the parameters of the physical condition were applied.

**Intervention phase:** it was developed through the selection of exercises adapted to the home context to maintain the physical condition of the older adults under study; which was evaluated by specialists and applied during the months of November 2021 to January 2022.

**Post-test evaluation phase:** in which the instruments used in the initial diagnostic phase were applied. The statistical processing of the data was carried out using descriptive measures for quantitative data, in this case, the arithmetic mean and the empirical distribution of frequencies.

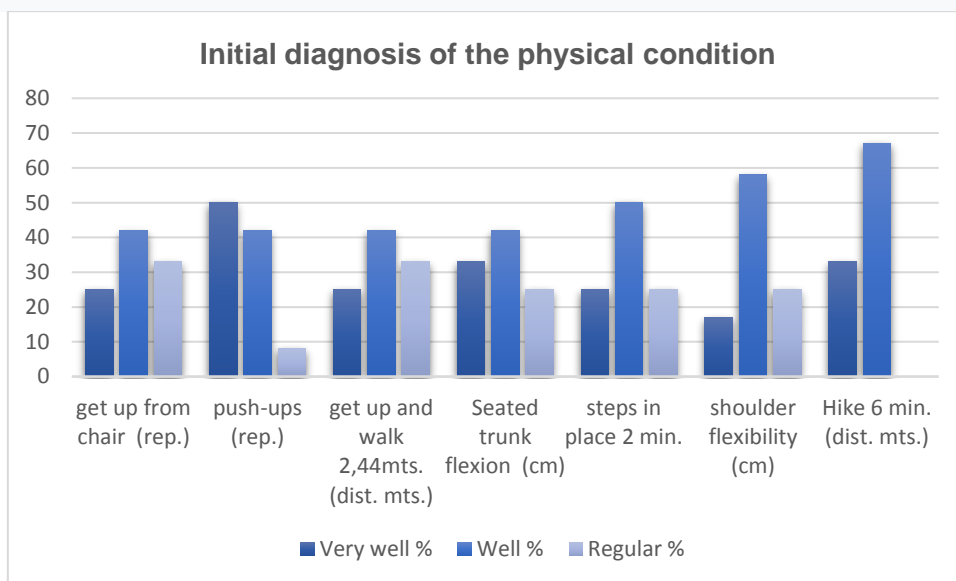
## Results and Discussion

Regarding consumption habits, 80% consume coffee, while 10% smoke, constituting predisposing factors for the chronic diseases with the highest incidence presented, which are Arterial Hypertension, with 60%, Diabetes Mellitus type II, with 30% and circulatory disorders, with 10%. The average time of sports practice is two years.

The relationship between height and weight with the Body Mass Index (BMI) according to sex shows that 33% of older adults are overweight, 50% are evaluated as normal but within the upper acceptable limit and only 17% remain as healthy. These results are associated with the period of inactivity caused by social isolation that caused physical deconditioning in grandmothers, a fact that reinforces the need for the systematic practice of low-impact and moderate-intensity exercise to stimulate the consumption of fats as an energy source.

In the results described by Mattioli et al. (2020) and Rodríguez, Crespo and Olmedilla (2020) found a relationship between reduced physical activity and weight gain during quarantine, which increases oxidative stress.

The following graph shows the results of the physical condition components measured in the research:



Source: self made

The average values show a predominance of the Good evaluation, which shows that the group maintains stability between the nervous and motor processes as a result of the systematic practice of physical activities for more than two years. In the strength of the upper limbs, the highest percentages are evaluated as Very Good, this is related to the result achieved by Quesada (2018) who proposes and implements adapted games to improve the strength of the upper limbs in older adults, taking as study population the practitioners of this circle of grandparents.

Intervention Phase: Includes two stages, one of selection and evaluation of the proposed exercises, and their practical implementation. In the first, the documentary review

allowed the analysis of: the bio-psycho-social characteristics of the elderly; the methodological indications for working with the elderly; as well as contraindicated exercises.

In the selection, moderate intensity exercises were considered that allow the activation of large muscular planes, in addition, the explanation and demonstration is offered through photos of each one of them, which will be carried out with a minimum frequency of three times a week, a duration between 50 and 60 minutes, including exercises to maintain and/or improve coordination, balance, flexibility, strength and aerobic resistance appropriate to the home context and the individual needs of the practitioners.

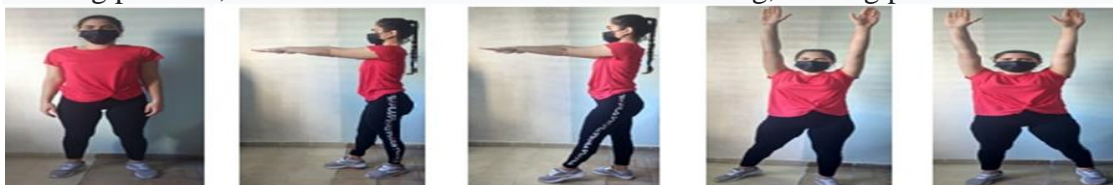
The adaptation of the exercises to the context of the home will allow moving from the zone of development to the zone of proximal development (maintaining the physical condition achieved with the systematic practice of physical exercises) and, above all, preparing the grandmothers to reach new goals and acquire new learning that stimulates resilience through the use of non-significant adaptations.

The proposal is made up of 36 exercises, subdivided into: sitting exercises, standing with support, with implements and in movement, with the aim of maintaining physical condition by stimulating the response capacity of the Nervous System to produce automatic motor patterns from the improvement of reaction time, the synchronized activation and inhibition of a series of muscle groups, the performance of simultaneous, alternative or dissociated movements and the adaptation to new and unexpected situations in order to resolve them as efficiently as possible.

Jiménez, Carbonell and Lavié (2020) propose a program of aerobic training exercises, resistance, balance, coordination and mobility, in such a way that levels of physical activity are achieved, to overcome the difficulties of the pandemic.

**Below are two examples of the exercises that make up the proposal:**

Combined exercise without implements. Starting position: Stops; arms by the sides of the body, both feet shoulder-width apart. Extend arms in front and right leg in front with support. Return to the starting position, alternate the movement with the other leg. Initial position, carry arms extended above and right leg extended to the side with support. Starting position, alternate the movement with the other leg, starting position.



Combined exercise with ball. Initial position: Stop, holding the ball in the hands, arms extended above, feet shoulder-width apart, squat, feet facing outwards, carrying the ball down, starting position, twisting the trunk to both sides. Perform 8 repetitions.



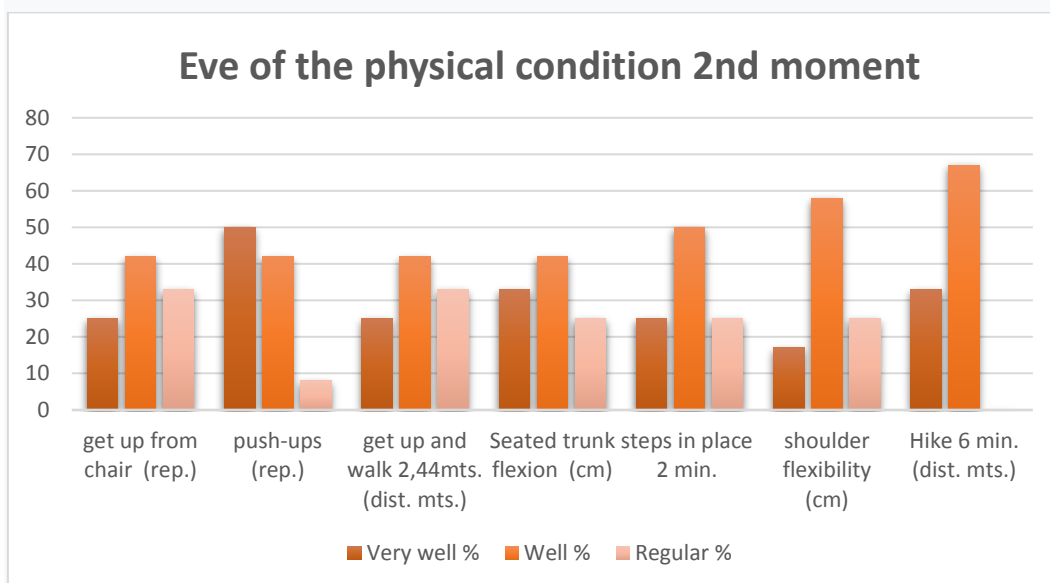
In the **second stage** of phase two, the proposal was submitted to the criteria of the specialists, which was favorable when considered:

- Maintenance and/or improvement of physical condition is facilitated.
  - It constitutes a planned and organized way of carrying out the activity in accordance with the interests of the participants.
  - The treatment of the contents with methods according to the practitioners is guaranteed.
- The proposals favor the treatment of values and prophylactic and/or preventive work based on the contents themselves.
- In a general sense, they express that they contribute to enriching the classes, adjusting them to the current epidemiological situation.

- The material can be a reference tool for professionals who work with these ages.

Final evaluation phase or post-test: The tests applied in the diagnostic phase were applied in a second moment.

The height and weight relationship with the Body Mass Index (BMI) according to sex does not show appreciable changes, since the percentages remain similar to the diagnosis, with 33% of older adults being overweight, 50% being evaluated as normal but in the upper acceptable limit, although there are two cases that show a trend towards healthy normality and only 17% remain healthy. These results respond to the short time of practical implementation of the exercises, which shows the slowness in the adjustments of the metabolic processes at these ages. The evaluation of the physical condition indicators after applying the exercises is shown in the graph:



The highest percentages are reached in the evaluations of Good for all the tests, and in the case of flexion of the arms there is a parity of 50% for the evaluations of Very Good and Good. The objective is satisfactorily achieved, although a greater change in the distribution of percentages is not appreciated, a fact that is justified by the slowness

between the neuroplastic processes of the brain at these ages that make the process of adaptation and activation of the traces more slower than in young subjects.

**Table I. Comparison of the results of the tests applied before and after applying the exercises adapted to the home context**

<i>Measurements</i>	<i>Very well</i>		<i>Well</i>		<i>Regular</i>	
	<i>1st</i>	<i>2nd</i>	<i>1st</i>	<i>2nd</i>	<i>1st</i>	<i>2nd</i>
<b><i>Tests</i></b>	%	%	%	%	%	%
<i>get up from chair (rep.)</i>	25	33	42	50	33	17
<i>push-ups (rep.)</i>	50	50	42	50	8	0
<i>get up and walk 2,44mts. (dist. mts.)</i>	25	25	42	50	33	25
<i>Seated trunk flexion (cm)</i>	33	33	42	50	25	17
<i>steps in place 2 min.</i>	25	25	50	50	25	25
<i>shoulder flexibility (cm)</i>	17	33	58	50	25	17
<i>Hike 6 min. (dist. mts.)</i>	33	42	67	58	0	0

Source: self made

The table shows the behavior of the physical condition indicators studied, those that remain relatively stable, with the highest percentages evaluated as Good, although improvements are seen in the subjects evaluated as regular, who assume better evaluations and those who persist associated with overweight detected in the BMI.



Similar results are shown by Ortiz and Villamil (2020) where the objective of their work was to determine the importance of practicing physical activity (PA) during the time of social isolation and confinement, and its positive effects to face the consequences on physical and mental health. mental illness caused by COVID-19.

## **Conclusions**

1. The characterization of the physical condition of the elderly showed results evaluated as Very Good and Good, which correspond to the time of systematic practice of physical activities of the group, which is two years, evidencing the importance of maintaining the condition physical achievement achieved by practitioners in conditions of social isolation to maintain self-worth, feel well both physically and psychologically and counteract the negative effects of chronic diseases present, which has a positive impact on the immune system.

2. The selected exercises are based on an inclusive, personalized, developer and flexible approach, which guarantees to address the possibilities and potential of older women.

3. The evaluation of the results of the practical application of the exercises allowed us to verify that they are effective in maintaining the physical condition in the context of the home, of the older adults of the Circle of Grandparents "Alegrías de Vivir" of the Sports Combine "Mártires de Barbados ", to face the current pandemic situation, since it helps not only to maintain good physical and mental health during the period of social isolation and confinement, but also favors more resilient behavior and a better response to infection. by COVID-19, reducing the risk of mortality.

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