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Physical exercise guideline to counteract the osteoarthrosis´s morning syntoms in the elderly

Guías de ejercicios para contrarrestar los síntomas matutinos de la osteoartrosis en el adulto mayor

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ABSTRACT

Attention to the elderly is one of the priorities of the Cuban government. The research was carried out in the doctor´s office number 6 of Pinar del Río municipality. Theoretical methods were used (review of documents, inductive-deductive) and empirical methods (observation and interview) that made possible to deepen into the elderly characteristics, more common diseases, symptomatology and treatments, what confirmed that the elderly, when awakening, suffer from greater symptomatology in some diseases. Some guides of physical exercises were made to compensate this disorder, which are mainly based on joint mobility. The exercises are simple and easy to remember. Favorable results have been obtained according to the sample selected for the study, it was achieved pain relief and reduction of numbness, as well as undoubtedly a better day start with a favorable mood.

Keywords: the elderly; osteoarthrosis; guide of physical exercises; joint mobility.

RESUMEN

La atención al adulto mayor es una de las prioridades del gobierno cubano. La investigación se realizó en el consultorio 6 del municipio Pinar del Río. Se utilizaron métodos teóricos: (revisión de documentos, inductivo-deductivo) y empíricos: (observación y entrevista) que permitieron profundizar en características de los adultos, enfermedades más comunes, sintomatología, tratamiento, lo que posibilitó constatar que los adultos mayores, al despertar, presentan mayor sintomatología en algunas enfermedades. Para atender este caso, se elaboraron guías de ejercicios para compensar este padecimiento. Estas guías se basaron, fundamentalmente, en el trabajo con la movilidad articular. Los ejercicios son sencillos y fáciles de recordar.

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Se han obtenido resultados favorables respecto a la muestra seleccionada para el estudio, se logró alivio en los dolores y reducción del entumecimiento y un mejor inicio del día, con un favorable estado de ánimo.

Palabras clave: adulto mayor; osteoartrosis; guía de ejercicios; movilidad articular.

INTRODUCTION

The United Nations refers to the older adult as a person who has turned 60 or over, although there is no clear consensus on this since some countries take 65 as the lower limit and others even set 70 as the norm. González, A. and Vázquez, I. (2010)

Scientific and technological advances in medicine have reduced fatal diseases and made it possible to reduce the mortality rate and increase life expectancy. As a result, society at the end of the twentieth century was faced with a new phenomenon: the longevity of its population.

It is now widely acknowledged that the impact of disease on patients cannot be fully described by objective health measures such as the spread of a tumour, the result of a biopsy or the measurement of blood pressure; other "subjective" factors such as pain, functional capacity or emotional well-being have to be considered. Hootman, J. and others (2018)

Osteoarthrosis (OA) or osteoarthrosis is the most common joint disease in the adult population and is currently a major public health problem. Peat, G. and others (2001)

Epidemiological studies on osteoarthrosis show important methodological variations according to the criteria used for diagnosis; radiological criteria tend to overestimate the disease and the most commonly used diagnostic combination is the association of clinical and radiological criteria. Osteoarthrosis causes chronic pain and incapacitates the patient. It is the most common rheumatic disease, characterized by a progressive decrease in articular cartilage, with destruction of the subchondral bone of the joint, and inflammatory phenomena may be associated with its evolution. Joint pain is progressive, accompanied by stiffness and loss of joint function, nocturnal pain is common and can trigger it with minimal movement, in the advanced stages of the disease. The symptoms and signs of the disease are limited to the affected joint, but if it is polyarthy-cular it can simulate a systemic inflammatory disease.

Other research showed that women had up to 26 % OA in their hand, compared to 13% of men in the Framingham cohort. Bilateral symptoms were observed in 16% of women and 7% of men. The joints with the greatest radiological affection were the distal interphalangeal joints. OA in hands caused functional disability in activities of daily living such as carrying lumps, grasping small objects and writing. Olsen C. F. and Bergland, A. (2014).

There are currently studies demonstrating differences in prevalence between different populations. There is a low prevalence of hip OA in a Chinese population compared to a similar population in the United States, as well as a high percentage

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of lateral knee space impairment in a Beijing population compared to this impairment in the Framingham population in the United States. Kemmler, W. (2015)

In the early diagnosis of osteoarthritis, known risk factors, which predispose to the onset of the disease, may be useful, general and local and, in turn, modifiable and non-modifiable. Felson, D.T. (2004)

General risk factors that cannot be modified:

- Age. Osteoarthritis increases with age, affecting first the hands and spine, and then knees and hips.
- Sex. There is a greater prevalence of osteoarthritis in women, especially from the age of fifty-five.
- Race and genetic susceptibility. Although osteoarthritis has a universal pattern and does not present racial differences, hereditary forms have been identified in depot diseases and in osteochondrodysplasias.
- Climate. There is no evidence that climate influences the prevalence of osteoarthritis, although it is common to perceive a relationship between climatic variations and the symptoms of the disease, however, the intrinsic mechanism of this effect is not yet known.

Modifiable general risk factors:

- Obesity. Obesity acts through mechanical effects and there is a relationship between the degree of obesity and the probability of developing osteoarthritis and its severity.
- Physical and occupational activity. The continuous and repetitive use of a joint for long periods can lead to focal lesions of osteoarthritis.
- Bone mineral density. The higher the mineral density, the greater the biomechanical stress on the cartilage.

Local risk factors.

Any eventuality that alters the geometric congruence of the articulation will mean a favourable factor for the development of osteoarthritis. We can quote:

- Epiphyseal dysplasias or malformations.
- Developmental alterations or joint misalignments (genuvaro/valgo).
- Situations of joint instability and hypermobility.
- Trauma.
- Neuropathic arthropathies.
- Persistent joint inflammations.
- Paget's disease.

The amplitude of joint movements varies by age, sex, and race. Limitation of active mobility may be due to joint pathology, while passive mobility expresses joint disease. The range of joint mobility is measured using the "Zero Method", where the anatomical position of the trunk and limbs is considered as zero degrees. Joint stability may be compromised in ligamentous disorders. Varahra, et al., (2018)

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In the rheumatology manuals, clinical-pathological correlations appear on the origin of pain in osteoarthritis and thus the possible structures are all the joints and periarticular that present innervation: bones (increased intraosseous pressure, microfractures, periosteal elevation), synovial and bursas (effusion, synovitis), nerves (pressure of the osteophytes on neighbouring nerves), periarticular structures (ligaments, muscles), meniscus lesions, etc. It is difficult, in clinical practice, to know which of these structures is the cause of pain in the patient, since it is more an approach and an art than a science.

The best way to get to know your cause is a thorough clinical examination, and probably the most affordable imaging technique that can help is ultrasound. In studies that have sought an association between pain and osteoarthritis, the following factors have been detected: sex, age, lower limb involvement, obesity, psychological factors such as anxiety and depression, joint effusion, Baker's cyst. The intensity of the radiological grade also correlates with an increase in the probability of perceiving pain, although patients with severe radiological affectation may be asymptomatic. Mendieta, E. (2005)

The progression of the disease is usually slow. The best studied location is the knee and long-term studies show that progression occurs in one-third to two-thirds of patients, while a significant percentage of them may remain in a relatively stable condition. Bjordal, et al. (2004)

The treatment of osteoarthritis is fundamentally symptomatic and has three priority objectives: to relieve pain and discomfort; to improve the functional capacity of the affected joints; and to slow the progression of the disease. The treatment is based on pharmacological and non-pharmacological measures in addition to surgical treatment. Prolonged immobilisation is not recommended as it favours the progression of osteoarthritis.

Physical therapy plays a fundamental role in the management of osteoarthritis and its objectives are to reduce joint pain and stiffness, maintain and promote muscle strength and trophism, and improve joint mobility and biomechanics. It uses techniques such as thermotherapy, hydrotherapy, massages and a physical exercise program adapted to each situation. Rodríguez and others, (2017). Exercise has been shown to be beneficial in pain control and in the functionality of the knee and hip with OA. All types of exercise that help strengthen periarticular muscles have proven useful. It is important to insist that the patient carry out some type of physical activity, as it is known that OA predisposes, due to pain, to less exercise, which results in an increase in cardiovascular morbidity and mortality. Park, et al. (2017)

The patients with osteoarthritis have loss of strength mainly in the muscular groups of the affected articulations, reason why it is useful the accomplishment of exercises that strengthen the musculature and improve the joint mobility, when strengthening the muscular force diminishes the overload, at the same time that diminishes the degree of anxiety and depression as a consequence of the improvement of the physical capacity.

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Exercises must be carried out when there is no pain, in a suitable environment, with comfortable clothes that allow certain flexibility. It will be done correctly, when the pain has disappeared and will be suspended if it reappears. You will rest between exercises and these will increase in number and intensity. (Moreira, Oliveira, Lirani-Galvão, Marin-Mio, Santos and Lazaretti-Castro, (2014)

In view of the above, the following scientific problem is proposed for the study: how to counteract the morning symptoms of osteoarthrosis in the elderly in medical practice number six, ¿belonging to the "Pedro Borrás" health area of the municipality of Pinar del Río?

In order to respond to this problem, the following objective was set: To elaborate exercise guides to counteract morning symptoms related to osteoarthrosis in the elderly in medical office number six, belonging to the "Pedro Borrás" health area, in the municipality of Pinar del Río.

MATERIAL AND METHODS

A quasi-experimental epidemiological investigation was carried out, consisting of a proposal for exercise guides to be used, upon awakening, by older adults with degree of validity I (adults capable of taking care of themselves in their daily activities at home and in the community) and II (adults who have no social life, but have adequate family and individual life), with symptoms of suffering from osteoarthritis.

For the initial diagnosis, a work was carried out with the document Historia de salud familiar (Family Health History), from medical practice number six, from the health area "Pedro Borrás", belonging to the municipality of Pinar del Río, which made it possible to select the sample according to its pathology; in addition, an interview was carried out with older adults that allowed us to know their sufferings and determine their needs. The older adults interviewed signed their informed consent. Inclusion and exclusion criteria were taken into account.

Inclusion criteria:

- To be found dispensed in the population served by the basic health team of the clinic number six of the polyclinic "Pedro Borrás".
- To be 60 years of age or older.
- To answer the questions of the structured interview.

Exclusion criteria:

- Physical or mental inability to respond to structured interview questions.
- Failure to meet inclusion criteria.
- Failure to sign informed consent to be part of the study.

Taking into account the theoretical study carried out and the results of the scientific methods used, an inventory of difficulties and potentialities was made:

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Difficulties:

- Morning pain and stiffness in older adults.
- Sedentarism.
- Lack of knowledge about the advantages of physical activity on the part of older adults and their families.
- Little incorporation to the circle of grandparents.
- They dedicate their time fundamentally to the tasks of the home, to make errands and to take care of the grandchildren.

Potentialities:

- Correct identification of the total number of older adults in the community by the basic health team.
- Dispensing in risk groups and characterization of older adults with osteoarthrosis.
- Fully literate population which allows the correct reading of the proposed exercise guide.
- In-depth theoretical study of osteoarthrosis, its symptoms and the importance of exercises to counteract them.

RESULTS

Next, the results obtained in the initial diagnosis will be analyzed in order to characterize the current situation of the older adults selected for the study. In chart 1, it can be observed that in the sample studied, women predominate over men (57.80 % and 42.20 % respectively). The most frequent age range was 60-64 years for the female sex and 7074 years for the male sex. This is in correspondence with foreign and national epidemiological studies, since it is known that women tend to live a little longer, due to the cardioprotective effect of female hormones. (Table 1)

Table 1. - Age distribution of older adults in medical practice number six in the "Pedro Borrás" Health Area. Pinar del Río, 2018

Age	Female sex	%	Male sex	%	total	%
60-64	29	64.45	16	35.55	45	26.00
65-69	13	54.20	11	45.80	24	13.90
70-74	17	48.60	18	51.40	35	20.20
75-79	20	58.80	14	41.20	34	19.70
80-84	13	61.90	8	38.10	21	12.10
85 +	8	57.10	6	42.90	14	8.10
Total	100	57.80	73	42.20	173	100.00

In the clinic, osteoarthrosis was the second most common chronic noncommunicable disease in older adults after hypertension with 64.73 %, although it is considered to be under-recorded. (Table 2)

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Table 2. - Chronic non-transmissible diseases in the elderly of the medical office number six of the Health Area "Pedro Borrás". Pinar del Río, 2018

Chronic non-transmissible diseases	F	%	M	%	TOTAL	%
Arterial Hypertension	57	57.00	66	90,40	123	71,10
Diabetes Mellitus type 2	45	45,00	33	45,20	78	45,10
Ischemic cardiopathy	9	9,00	16	21,90	25	14,45
Bronchial Asthma	32	32,00	33	45,20	65	37,57
Hiperlipidemia	49	49,00	51	69,90	100	57,80
Cancer	5	5,00	7	9,60	12	6,93
Osteoarthrosis	69	69,00	43	58,90	112	64,73

In the doctor´s office, older adults predominate with degree of validity III, they can meet their individual needs, but are not able to maintain an adequate individual family life. Adults from groups I and II were selected for the study, so from a universe of 75 adults, they were selected for having symptoms of osteoarthrosis 35, representing 46.66 %. (Table 3)

Table 3. - Degree of validity of the older adults of the medical practice number six of the Health Area "Pedro Borrás". Pinar del Río, 2018

Degree of validity	Elderly	%
I	20	11.70
II	55	31.80
III	93	53.75
IV	5	2.75

Among older adults identified with osteoarthrosis, the most frequently reported symptom was morning stiffness (91.40 %), followed by pain (80.00 %), in accordance with the reported literature, and it is time to awaken when these symptoms become more acute. (Table 4)

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Table 4. - Symptoms associated with osteoarthrosis in elderly, from medical practice number six in the "Pedro Borrás" Health Area. Pinar del Río, 2018

Síntomas	Total	%
Pain	28	80.00
Morning stiffness	32	91.40
Deformity	21	60.00
Fractures	8	22.85

It was found that the morning schedule, specifically upon awakening, is the one in which the symptoms of osteoarthrosis were most annoying (97.10%), mainly rigidity and subsequent pain, in line with the literature reviewed. (Table 5)

Table 5. - Time of day with aggravation of symptoms related to osteoarthrosis in older adults, from doctor's office number six of the Pedro Borrás Health Area. Pinar del Río, 2018

Hours	total	%
Morning	34	97.10
Afternoon	16	45.70
Night	28	80 00

The highest percentage of elderly interviewed stated that they did not exercise, 65.70 %. They exemplified exercises such as going out to buy food, carrying out household chores and incorporating grandparents into the circle to a lesser extent. (Table 6)

Table 6.- Practice of physical exercises for older adults, from doctor's office number six in the "Pedro Borrás" Health Area. Pinar del Río, 2018

Practice of Physical exercice	total	%
yes	12	34,30
No	23	65,70

Taking into account the results found and the need for elderly to alleviate the symptomatology of osteoarthrosis they suffer, two exercise guides were elaborated to alleviate the morning symptoms of this nosological entity.

Two exercise guides were elaborated

The first guide has 16 exercises and some orientation about them, all on one sheet, with good font size. The aim is not to overwhelm the adult with a lot of explanations and try to encourage him in his realization. Although they are told that a month they

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will be given another guide, this will only be done if the adult refers to remember all the exercises and perform them with ease.
The second guide has 17 exercises. There are exercises that do not vary from one guide to another, but this includes some that require a little more coordination.

Characteristics of the proposed guides and the exercises that compose them:

- They meet much of the objective of systematic exercise practice by older adults: maintenance, rehabilitation and prevention.
- Many of the most common symptoms of osteoarthrosis are relieved: pain, stiffness and numbness.
- They are feasible for any osteomyoarticular affectation: osteoarthritis, osteoporosis, rheumatoid arthritis, chondromalacia and invoices of hips or long bones.
- They are executed upon awakening, as this is the time when the symptoms have the greatest impact.
- They are performed in bed.
- Different positions can be adopted when they are executed, basically lying on the back and sides.
- Mobility exercises predominate.
- Due to their simplicity, they can be performed by any older adult.
- It is used in its description clear language and easy to understand for anyone.
- They can be easily remembered after several sessions.
- Whenever the practitioner lives with family members, they will be involved, making them understand the importance they have for adults.
- The execution of these exercises does not interfere with other physical activities carried out by the adult.

With no more important aspect to communicate, the exercise guides are shown below.

Exercise Guide 1

The exercises described below should be performed upon awakening, in bed, at a slow pace and 6 to 15 repetitions, as follows:

1. First week six repetitions.
2. Second and third week eight repetitions.
3. Fourth, fifth and sixth week 12 repetitions.
4. Next weeks 15 repetitions.

- Finger flexions.
- Wrist flexions.
- With arms next to the body, flexions of the arm over the forearm.
- Lying in the center of the bed, bring your arms to the sides and from that position bend them to the chest.
- Separate one shoulder from the mattress and then the other.
- The lateral arms carry them up.
- Arms to the side of the body to raise them from the front to the top.
- Bend your feet at the ankle joint.

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- Bend one leg at the knee joint, sliding the sole of the foot along the mattress, extending it again to run with the other leg.
- Flex the right leg through the knee joint while turning to the left (we can help with arm movements), return to the initial position to do it to the other side.
- Lying down, rub your arms, fingers and shoulders with your hands. Bend your legs, rubbing your thighs in front, behind and on the sides.

From sitting on the edge of the bed perform:

- Push the head gently to the front, and back (as if we said yes)
- Bending the head to the sides (tilting the head to one shoulder and then to the other)
- Neck twists on each side (as if we said no).
- Before getting up, wait a few minutes, rubbing your hands with arms, fingers, shoulders and thighs.

These exercises must be performed daily, you can start them with your eyes closed (after you know them) No matter the order in which they are performed, it is recommended to start them lying down. This is a way to start the day with greater mood, activating organs and systems, relieving pain and joint stiffness that they present upon awakening.

These exercises do not replace the classes of the older adult.

Exercise Guide 2

After some time doing the exercises oriented in the previous guide, they are given a new group of exercises as easy and simple as the previous ones, hoping that they will help them to maintain or improve their organic functions and that the pains and numbnesses are relieved by so many hours of inactivity by sleeping. These exercises will be carried out from 8 to 15 repetitions.

- Flexions and extensions of all joints (fingers and toes, arms by the joint of the elbows, wrists, knees and ankles).
- With one hand extend and flex the fingers of the other hand and vice versa.
- Raise your arms from the sides of your body to the top.
- Lateral arms (cross position) close them until you embrace yourselves.
- Separate both shoulders from the mattress at the same time.
- Elevate the right leg raising it up to its possibilities, return to the initial position to do it with the other leg.
- Flexionar the two legs by the joint of the knee with the arms to the sides of the body, raise the hip being supported by feet and shoulder blades.
- Bend the legs at the knee joint while turning to the left, adopting the fetal position, return to the initial position to do it to the other side (we can help with the arms).
- Separate the right leg to the side and return to the initial position with the other leg.
- Separate the two legs towards the sides and join them to the initial position.

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Raise one leg bent at the knee, with the help of the hands and with these bent, extend and rub the toes and ankles.

- Sitting on the edge of the bed, raise one leg bent by the knee, to bend, extend and rub with the hands the toes and ankles.
- Sitting on the edge of the bed, extend your legs and return them to the initial position.
- Push the head gently to the front and back (as if we said yes).
- Bend the head to the sides (tilt the head to one shoulder and then to the other).
- Twist the neck on each side (as if we said no).
- Rubbing fingers, thighs, arms and shoulders.

Do the exercises every morning when you wake up, do them, they are for your physical and mental well being, do not forget that physical activity relieves all evils.

In a conclusive way, it is stated that through this research it is corroborated that in the studied sample women between 60 and 70 years old predominate as an age group and osteoarthrosis is the second most frequent chronic non-transmissible disease after arterial hypertension.

The most frequent symptoms related to osteoarthrosis in older adults reported were morning stiffness and pain, with higher prevalence of the same at the time of awakening. It was identified that the highest percentage of older adults interviewed did not engage in physical exercise. Exercise guides to alleviate the morning symptoms of osteoarthrosis were developed for implementation in the near future and evaluated in later researchs.

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