

## Components of health-related physical fitness and physical-sport content of leisure

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### Abstract

People in general have access to guidance on body care and health via media, market and exchanges made on social networks, especially. However, much of what comes to them is abbreviated information, when not wrong guidance. The aim of this study was to systematize the components of health-related physical fitness and make them accessible to people seeking physical activities in the context of leisure. Health-related physical fitness refers to the physical condition in capabilities that bring implications for the quality of life of the population being such components the flexibility, aerobic resistance, strength, and body composition. The aptitude related to sports performance is associated beyond the above capacities, agility, speed, postural balance, and motor coordination. Access to this knowledge can be a way to minimize health problems arising from misinformation or poor guidance on such components and thus enhancing activities performed to bring contributions to people's health and quality of life.

**Keywords:** Physical sports; Physical fitness; Leisure, Quality of life

### 1. Introduction

According to preliminary information from the 2010 Census, conducted by the IBGE (Brazilian Institute of Geography and Statistics), the reduction in fertility and increased longevity of the Brazilian population is revealed. Brazil's trend in the coming years is to further increase the amount of elderly. The 2010 Census also showed a reduction in the average number of people per home in the last decade, from 3.79 in 2000 to 3.3 in 2010. This reduction can be explained by the lowest fertility rate of the Brazilian, with globalization and Increased access to technologies and better education, young Brazilians have fewer children and ages higher than their parents, which leads to population aging.

Rikli and Jones (2008) correlate that with the increase in life expectancy the physical condition gains greater importance. According to the authors, technological advancement has brought benefits and harms, on the one hand the advance in the medical area helps to increase life expectancy, on the other hand computing can lead to greater sedentary lifestyle, it can be associated that the Increased life expectancy leads to elderly individuals to live more years with limitations for the lack of physical fitness, caused by inactive lifestyle.

Health researchers have proven in several studies that both physical inactivity and low physical fitness are harmful to health, so they decrease the quality of life (Araújo and Araújo, 2000). The practice of exercise and physical activity in the context of leisure, besides combating physical inactivity, contributes significantly to the maintenance of the physical fitness of any age group, but here we draw more attention to the elderly, making them more Independent (ACSM, 1998). Physical fitness is the ability to perform everyday activities with less effort. One can deal with physical fitness in two ways, related to sports and health. Health-related physical fitness refers to the physical condition in capabilities that are deeply related mainly to the quality of life of people being flexibility, aerobic resistance, strength, and body composition.

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The activities carried out in the field of leisure provide people with greater motivation for health care, as they are generally activities chosen by people and performed in the time, they have available. Thus, we understand that it is fundamental for the proposed discussion here to understand the context of these activities performed and how the systematization of knowledge about the components of health -related physical fitness can be useful in terms of guidance to the common person who is not a professional athlete. Thus, the text is divided into two parts, initially we introduced some ideas about the accomplishment of physical activities in the context of leisure, we will focus on the physical-sport content of leisure, and, in a second moment, we will make a systematization of the components of physical fitness health -related.

### **1.1. The physical-sports content of leisure**

The physical or physical-sport content of leisure as it is treated by several Brazilian authors is part of a set of content studied in leisure that were initially introduced by Dumazedier (1980) and complemented by Camargo (1986) and Schwartz (2003). In total there are seven contents called: sports, manual, artistic, intellectual, social, tourist and virtual.

The physical-sports content of leisure that is focus here on our studies involves physical activities such as fighting, dance, gymnastics, game, sports, as well as walks and fishing. Therefore, when we refer to this content, we are talking about the ordinary person who works many hours a day or who has social, political, and religious obligations and in their available time performs activities involving the body manifestations.

It is rare studies focused on leisure to seek relationships with other knowledge such as biological, which here are the components of physical fitness. We think that this approach is interesting since the person who practices specific physical activities such as game, dance, fighting, gymnastics, and sport has access to information about the components of physical fitness (aerobic resistance, flexibility, localized strength and resistance and body composition) by the media, the market, social networks, but not necessarily they transform this information into useful knowledge for your life.

The physical and sporting content of leisure enhances care with it and with one's own body, as it involves the values of fun and personal and social development (DUMAZEDIER, 1980) and practitioners who can perform the activities of this content choose the activities that They are more interesting to him. This is a fundamental way to awaken in the practitioner the construction of knowledge about the body, among which, the biological aspects and health-related physical fitness is included.

For practitioners of activities that involve the physical and sporting contents of leisure, it is essential that they know what happens to the body when they are in an activity of strength or flexibility or aerobic and muscle resistance. Understanding what happens to the body is a way of these people achieving a degree of autonomy to know a program of activities or dose how much to do in terms of repetition, often, to integrate these activities in their daily lives and not be a sporadic or merely information consumption practice.

We see as fundamental for people to experience the different body experiences along with the diverse knowledge that support these practices and become knowledge to their practitioners who seek to gain autonomy to organize or manage such practices and, thus, benefit from the point of View of health in its broader sense of social law, caring for the body and mastery of the body's biological knowledge and this also generates implications for the practitioner's quality of life.

To systematize specific knowledge about physical fitness to the ordinary person who performs practices in the context of leisure, specifically physical-sports content, which includes physical activities, follows our notes for this purpose.

### **1.2. Components of health -related physical fitness**

#### *1.2.1. Aerobic capacity/aerobic resistance*

It is the capacity that an individual has performing a physical activity lasting more than four minutes, and the energy comes from the oxidative metabolism of nutrients. It is one of the most important capabilities that make up physical fitness by numerous data that can be obtained from its evaluation, for example, on the cardiorespiratory system and physiological responses to adapt to metabolic needs during exercise (Matsudo, 1987). Astran (1980) demonstrates that for each liter of oxygen consumed, 20kJ will be released, is the greater the oxygen captures the greater the energy production. For him the capacity concerns the total energy available different from the power that means energy per unit of time.

ACSM (2000) defines cardiorespiratory capacity as a component of health -related physical fitness that with increased age can decline resulting in a triggering of degenerative chronic diseases, such as hypertension and diabetes. When

regular physical activities are done, this capacity can interfere to reduce functional declines with a healthier and more independent life. Training this capacity can help maintain and improve various aspects of cardiovascular function that contributes to various aspects and healthier aging is obtained with lower risk of disease, falls, periods of morbidity that can result in reduced quality of life. This component is the ability of the heart, lungs, and blood to transport oxygen to the exercise muscles, and the use of oxygen by the muscles during exercise (Baroni et.al. 2011). Still for the author, aerobic exercises of relatively high intensity, for a relatively long period, increase the maximum aerobic capacity of 25%, the equivalent of a gain of 6 ml/ [kg. Min], or 10 to 12 biological years. For milk (2000) the cardiorespiratory aptitude of any individual refers to the functional capacity of their system of absorption, transportation, delivery, and use of oxygen to active tissues during exercise, as the intensity of exercise grows the need for oxygen, the need for oxygen grows, by active muscles, for continuous and prolonged efforts. The predominant energy system is the aerobic that to function properly needs an efficient cardiorespiratory system, ie it depends on the body's capacity.

Glaner (2003) understands aerobic capacity as the functional component of health -related physical fitness and being one that has cardiovascular and pulmonary function, defined as the body's ability to maintain a submaximal exercise during prolonged periods. Still for the author numerous studies show that trained individuals are aerobic have a reduction of chances for the development of coronary diseases, cancer, and diabetes. Pezzetta et.al. (2003) describes cardiorespiratory aptitude as the capacity of the heart, blood vessels and muscles providing numerous physiological responses, both at rest and submaximal and maximum exercise. According to FARRELL et al. (1998); Church (2001) moderate or high levels of cardiorespiratory aptitude can provide protection to cardiovascular diseases, even in the presence of predictors to them.

Wei et.al. (1999) Evidence in your studies a correlation between cardiorespiratory fitness and cardiovascular disease and realizes that low cardiorespiratory fitness is a strong and independent predictor of cardiovascular disease and mortality from any other cause.

According to Monteiro (1996) cardiorespiratory aptitude is the most important component of health -related physical fitness, for the author the improvement and maintenance of this component should be one of the main objectives of any exercise program because it induces positive changes in body composition, cardiorespiratory and musculoskeletal systems.

The rhythm of muscle loss in humans is greater than twenty at age sixty, which entails the fall in aerobic capacity, about 1% per year (Hayflick, 1996). The reduction of this capacity is part of the aging process, but changes can be minimized with aerobic and systematic training (MORAGES, 1997; OKUMA, 2002). Systematized training improves the aerobic capacity of the elderly, even though it has reduced due to age (Botelho, 2002) and is a means that besides physical benefits also bring improvements in socialization and with this of quality of life (Amorim and Dantas, 2002).

Maintaining aerobic capacity from middle age can slow the biological aging process within 12 years and prolong independence during the elderly (SHEPARD, 2008). High cardiorespiratory levels can significantly contribute to the elderly and the improvement in quality of life is provided, as they will allow them to perform everyday tasks such as walking, without excessive tiredness, thus preserving their autonomy (FURLAN, 2006).

### **1.3. Flexibility**

The term flexibility encompasses the amplitude of movements of simple or multiple joints, and the ability to perform specific tasks (ACSM, 1998). It is the ability to perform movements in certain joints with proper range of motion (BARBANTI, 2003). It refers to the degree of passive mobility of the body with its own restriction of the muscle-tending unit or other bodily tissues (Laissoe and Voigth, 2004).

For Pedroso (without date) is a physical quality that conditions the functional capacity of the joints to move within the ideal limits of certain actions. Baroni et.al. (2011) describe flexibility as the ability to move different parts of the body through a large range of movements. DANTAS et al. (2002) define that adequate flexibility helps the human being, both to find their functional balance in the various experiences, as well as to participate in full activities, either in leisure or in the community instance. According to Heyward (2004) flexibility is an important component of health -related physical fitness as well as helping to maintain good posture and reduce the risk of lesions and problems in the spine. In addition, flexibility is specific to each joint, ie there is no general measure for this component (MONTEIRO, 1996). ACSM (1998) describes that the flexibility of a joint depends on the preservation of the structures that compose it, bones, and connective tissues, for example.

It is measured, according to Achour Junior (2007), due to the scope of the joint movement and its change has been believed originating from the rigidity of the tissue. Flexibility is fundamental to movement and is then an essential component of the individual's functional aptitude. Therefore, the reduction of values in this component, in addition to restricting the possibility of moving, increases the risk of joint injuries (FARIAS et al., 2008).

To Baroni et al. (2011) The limitations imposed on the amplitude of movements are associated with the disability and discomfort of the subject, in this case, elderly. It is essential for the performance of daily tasks, such as squat, kneeling, tying the shoelaces of tennis (Rikli and Jones, 1997). According to the study by Carvalho et al. (1998) women show more flexibility than men mainly in back, hip, and lower limb movements. Already Bell and Hoshizaki (1981) state that there is a greater decline in flexibility in men to women.

According to Balfites et al. (1977) and Williams et al. (2002) from 25 and 30 years there is a reduction in joint flexibility. DANTAS et al. (2002) define that between 30 and 70 years of age the loss of flexibility is 20 to 30%. This loss associated with loss of muscle strength can affect balance, posture and elderly and may increase the risk of falls. In this age group, in addition to the decline in flexibility there is a reduction in habitual physical activity, so it is evident the relationship between the loss of mobility and the decrease in the quality of life of the elderly (CASTRO, 1999). Dantas et al. (2002), correlate the loss of flexibility to decrease muscle elasticity, impairing the functional autonomy of the elderly. Loss of flexibility and muscle strength in the elderly affects balance, posture, and functional performance, increases the risk of falls and breathing problems, decreases the speed of gait and makes it difficult daily routine activities. Flexibility can be worked through stretching (Varejao, 2008). There are three forms of training for flexibility according to Monteiro (1996): 1) ballistic or active training: forced and repeated movements, so it is gaining kinetic energy throughout the movement; 2) Static or passive: slow and progressive movement to the overload position where it remains for some time; 3) Proprioceptive neuromuscular facilitation: movement brought to its maximum amplitude and later static contraction is made to the elongated muscles. Rauchbach (1990) associating in an exercise program, stretching with general exercises and 42 participating seniors obtained significant improvement in almost 90% of these compared to lumbar spine flexibility and range of motion. Caromano et al. (2007) Likewise, through a walking program associated with elderly stretching had significant improvements in relation to predefined test flexibility, reducing the first distance. Candeloro and Caromano (2007) in a hydrotherapy program for elderly women showed the improvement in flexibility. Guadagnine and Olivoto (2004) conclude that the lack of physical activity causes muscle shortening, and that aging brings reduction in flexibility. Therefore, physical activity contributes to the improvement of flexibility, especially in the elderly age range and may reduce degenerative aging factors. According to the authors, the maintenance or gain of flexibility is an important goal in the health control of the elderly. With this, it is consensus that an elderly age program is directed, in addition to other factors, the improvement of the flexibility of this audience (Matsudo & Matsudo, 1992; APell & Mota, 1991; Marques, 1996).

#### **1.4. Localized muscle strength and resistance**

Barbanti (1979) defines muscle strength as the ability to exert muscle tension against resistance, involving mechanical and physiological factors that determine strength in some movement. For Guedes (1997), strength is the ability to exert muscle tension against resistance, overcoming, supporting, or giving in to it. Similarly, Moura (2003) states that muscle strength is the definition for muscle capacity to produce maximum tension, strength and torque at a given speed. FOX et al. (2000) defines muscle strength as the force that a muscle or muscle group can exert on resistance in a maximum effort. Nahas (2003) defines localized muscle resistance as the individual's ability to perform a certain movement numerous time for the longer time at the same pace and with the same efficiency, using low levels of strength. Similarly, Fox et al. (2000) observes this capacity as one that a muscle group performs repeated contractions against a load or maintains contraction for a prolonged period. In addition, the authors define that localized muscle resistance may be the opposite of muscle fatigue, in which the muscle has little localized resistance.

For Wilmore et al. (2010) muscle resistance is the ability to support a certain strength or maintain repeatedly muscle contractions over time, according to Sacco and Tanaka (2008) to perform everyday activities such as walking, carrying objects or standing in a line. In addition, the abdominal muscles are responsible for maintaining the posture erect. Amorim and Dantas (2003) with the advancement of age one can observe a decrease in the functional capabilities of the individual due to the sedentary lifestyle. As muscle strength is aged decreases due to the loss of type I and II fibers related to neurological changes at the level of a motorcycle neuron (Powers and Howley, 2005). To have independence, health, and functional capacity in aging it is necessary to maintain muscle strength by exercise (Fleck and Kramer, 1999). The decrease and loss of both strength and muscular resistance generate conditions of weakness, body imbalance, among other consequences that can lead to the decrease in quality of life, being one of the biggest problems of elderly individuals found in recent times (Rocha et al., 2009; Matsudo et al., 2000). According to Tartaruga et al. (2005) There are several factors that contribute to the loss of muscle strength with age being: musculoskeletal changes, accumulation

of chronic diseases, drugs necessary for disease treatment, changes in the nervous system, reduction of hormonal secretions, malnutrition, and atrophy by disuse. Akima et al. (2001) verify the effect of aging on muscle strength and strength per unit of transverse area in men and women and find an inverse relationship between the torque peak in the extension and flexion of knees and age in both sexes. Therefore, for the authors muscle strength losses would be due to the decline of muscle mass during the age. In functional terms regular physical activity increases strength and muscle resistance (WILMORE et al., 2010). Elderly individuals can increase muscle strength, even individuals over 90 years as long as they are properly stimulated with proper training (Nieman, 1999; Barbosa, 2007). Improvement of muscle strength is one of the positive effects of physical activity on aging where numerous benefits are obtained in which they include an improvement in bone health, so the reduction in the risk of osteoporosis; Improved postural stability, reducing the risk of falling and injuries that can lead to fractures, and greater flexibility and amplitude of motion (ACSM, 1998; Matsudo, 2008).

Localized muscular resistance is low with performance in sports that involve explosive force or power, but it is of fundamental importance in slowing down the fatigue process (SACCO and TANAKA, 2008).

### 1.5. Body Composition

Malina and Bouchard (1991) define that the study of body composition concerns the quantification of tissues that make up body weight through different techniques. McArdle et al. (1998) add that body composition assessment allows you to quantify the main structural components of the body such as muscles, bones, and fats. Relating the quantity and proportion of the various components of the human body which can refer to the individual's disease, health, and quality of life (Böhme, 2000).

During chronological age the body undergoes biological and physiological changes, therefore changes in body composition such as increased body fat and loss of bone mineral density, are the result of normal aging (Elsangedy et al. 2006; Joseph and Ryan, 2004). Aging occurs in all beings and is associated with various factors, genetic, chronic diseases, lifestyle. Influenced by all this, the elderly becomes more inactive, having their physical abilities affected (DANTAS et al., 2002; Matsudo and Neto, 2000). Silva (2008) associates that with the difficulty of performing daily activities, the individual has as consequences for poor nutrition (low weight or obesity).

The evaluation of body mass index (BMI) has been used to characterize nutritional status in the elderly (SILVA, 2008). Increased abdominal adiposity is a strong determinant for the development of hypertension as it can affect the circulatory system, and it impairs the kidneys and sugar metabolism. Therefore, the reduction of body weight in this audience with physical exercise can, consequently, reduce blood pressure and there is evidence that can bring the reduction of intra-abdominal fat, which is known is increased with old age (Elsangedy et al., 2006; FERREIRA, 2000; ZANELLA, 2000; PAPALIA AND OLDS, 2000; DARONCO ET.AL., 2008). Body composition can be improved with similar endurance training in elderly and adult individuals. Regular physical activity can reduce body fat values, a decrease of 1 to 4% of body fat in the elderly is possible (Hagberg et al., 1989; Martins and Rodrigues dos Santos, 2004).

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## 2. Conclusion

The objective of this study was to study the components of health-related physical fitness and make them accessible to people who seek to perform physical activities in the context of leisure. We initially sought to introduce some ideas from the leisure field and specifically the physical-sport content of leisure and we approached the biological knowledge of the body as a way of knowledge for practitioners.

Regarding the components of physical fitness, it is concluded in this study that the aerobic capacity concerns the ability of the individual to perform a physical activity. It is one of the most important capabilities that make up physical fitness by numerous data that can be obtained from its evaluation, for example, on the cardiorespiratory system and the physiological responses to adapt to metabolic needs during exercise.

The term flexibility is defined by numerous authors by the amplitude of movements of simple or multiple joints, and the ability to perform specific tasks (ACSM, 1998; Barbanti, 2003; Baroni et al., 2011).

Force can be related to the ability to exert muscle tension against resistance, overcoming, supporting, or giving in to it. Some authors still describe the relationship of force with maximum torque production at a certain speed. Localized muscle resistance is the ability of a muscle group to perform repeated contractions against a load or maintain contraction for a prolonged period. Therefore, it is the ability of the individual to perform a certain movement numerous times for the longer time at the same pace and with the same efficiency, using low levels of strength.

Body composition is related to the quantity and proportion of the various components of the human body which may refer to the individual's disease, health and quality of life. Evaluating body composition allows you to quantify the main structural components based on physical exercise prescription. It is noteworthy that body composition can be improved with endurance training similarly in the young and adult individual, as there is also a lot of mythification of the prescription of exercises for the elderly.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to disclosed.

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