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Review article

Considerations on Endurance Training through Rhythmic Physical Activities

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Abstract

The purpose of this paper is to systematize the theoretical rationale for the inclusion of rhythmic activities to enhance the physical capacity of physical endurance. The research relied on systematic documentary review of books, graduate theses, and scientific papers indexed in different electronic databases such as Latindex, Dialnet, and Redalyc. Although this topic has been insufficiently dealt with, some authors were found to contribute in the area of rhythmic physical activities, and the physical capacity of endurance. It demonstrates the relation between rhythmic physical activities and the capacity of endurance, which results in greater life quality as an alternative to training for various sports disciplines and recreational activities.

Keywords: Physical activity, endurance, rhythmic activities.

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Introduction

The purpose of this documentary review is to analyze the state of the art regarding the study of physical activities to enhance the physical endurance capacity.

“The Covid-19 pandemic and the ensuing compulsory quarantining have posed a new challenge in the area of sport sciences and exercise (...)”. (Suarez Rubio, G., 2021, p.57).

This research coincides with the results of Bermúdez C. & Sáenz P. (2019), about the importance of systematic reviews, since they offer valuable information about state of the art research of a specific field, permitting new lines of research in the future, particularly in the area of rhythmic physical activities and their influence on endurance.

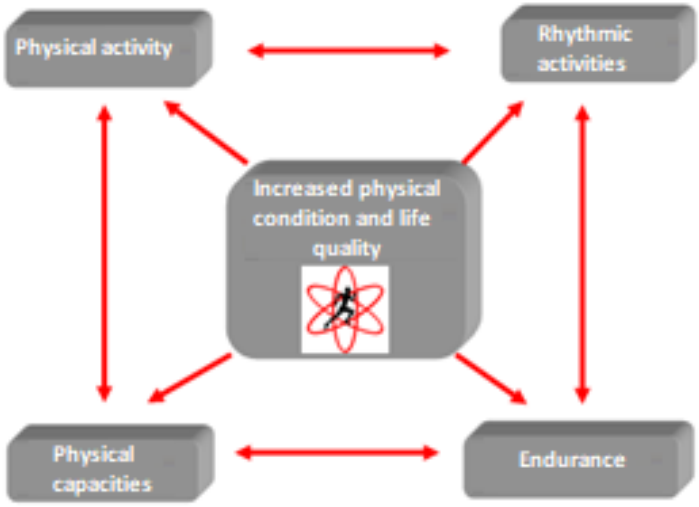
Therefore, this study focuses on the study of rhythmic activities and their relation to the development of endurance in the different areas where it takes place.

A physical activity is any body movement produced by the muscles, which entails energy consumption; that is, physical activities are present in every movement of daily life. These considerations are shared by several authors, like Vidarte

Claros, J., Álvarez, C. V., Cuellar, C. S., & Mora, M. L. A. (2011), who noted that "Physical activity is a concept that comprises body movement made by the muscles in the skeleton, causing energy waste, which is present in everything a person does around the clock" (p.215). This activity is accompanied by movement, according to Garzón, P. C., Fernández, M. D., Sánchez, P. T., & Gross, M. G. (2002).

Among the physical activities are rhythmic and recreational activities. Physical recreation is a two-word concept defined as a more active recreation that integrates a group of phenomena and relations that emerge during leisure time use. Based on this analysis, some of the physical activities include recreational activities, and these include the rhythmic-physical activities.

Today, physical activities play a very important role within health, sports, and recreation. Authors like Vidarte Claros, J., *et.al*. (2011) claim that "Physical activity interacts with other activities (the arts, the culture, the movies, the music, etc.) that seek to improve life quality (...)" (p.206); thanks to it, a broad range of results can be achieved. Accordingly, the aim of this study is to demonstrate that rhythmic physical activities can help enhance people's endurance (Figure 1).



Development

The conditional physical capacities are defined as individual characteristics of people, which determine the physical conditions, and are explained through mechanical actions and energetic and metabolic processes of voluntary muscle performance. This group includes endurance, strength, speed, and flexibility (Rueda, Daza & Daza, 2019). These capacities can be measured, as they materialized depending on anatomical-functional aspects, and can be developed through training and systematic and organized practice of physical exercise. (Gutiérrez, F. G. (2011).

Endurance as a physical capacity

Endurance is considered one of the most important physical capacities, according to Jiménez-Simón, C. (2021).

Based on the nature of humans, it is the capacity most needed by people to live; it is the last one to lose, and its development depends largely on the strength of an individual. However, when beginning any training activity, it is important to create an aerobic-anaerobic backup in the athlete's body, which is only possible thanks to the development of endurance (Collazo, 2002), and depending on a person's capacity, their effort will last longer or shorter. Velázquez-Naranjo, C.; Cubero-Morán, J.; Molina-Guzmán, J. (2020).

Different definitions of endurance have been assumed by various authors, but in general terms, they coincide in the capacity of withstanding fatigue through effort, maintaining an effective performance, as shown below:

- Limited time at which work at a particular intensity can be done (Bompa, 1983).
- The capacity to do prolonged work at the required intensity level, fighting fatigue. It is the capacity of endurance by the human body against exhaustion to conduct prolonged physical exercise that ensures maintaining a load over high intensity for la long time.
- The capacity of athletes to withstand fatigue.
- The physical and psychic capacities of withstanding exhaustion caused by a relatively long effort, and the capacity of quick recovery after the effort.
- It is the human capacity of making efforts through a prolonged time, maintaining a high working capacity.
- It is the human body's capacity of fighting exhaustion (fatigue), manifested

through lasting activity without reducing performance.

- According to Verjoshansky (1990), it is the psychophysical capacity of humans to withstand the appearance of fatigue for the longest possible time. In other words, the effort made by a person can be effective for as long as possible.

The value given to endurance is based on the capacity to make long-lasting efforts, but at the same time, on the making of prolonged efforts with diverse intensities for not so prolonged periods (Rueda *et al*., 2019).

The geart rate is the most frequently variable studied in the physiology of endurance practice. It can be modified by the effects of training, though, it can increase linearly with the intensity of exercise (Ortigosa *et al*., 2019).

According to Carrasco (2014), the functions of endurance lie in keeping an optimum intensity of loads for as long as possible, and keeping minimum inevitable losses of intensity when dealing with prolonged loads; increasing the capacity of withstanding voluminous loads during training and competition; accelerated recovery following the loads, and stabilization of sport techniques and the capacity to focus.

Depending on the most commonly used energy form, endurance can be classified as aerobic and anaerobic. Below, aerobic and anaerobic endurance is explained in detail (neither is appears as a pure form during sports practice).

Aerobic endurance is the capacity of the body to take prolonged physical exercise without reducing efficiency (Zatsiorski, 1989). Anaerobic endurance is the capacity of the human body to maintain the demanded effort for a long period of time (Aragón and Fernández, 1995). It is the capacity of the body to withstand a high debt of oxygen by keeping an internal effort for the longest possible time, in spite of the progressive decrease of organic reserves.

It is characterized by an intense effort whose duration must overtake the “critical limit” (to cause an oxygen debt), without which it cannot be considered anaerobic work. The pulse goes above 150-160 per min, while the oxygen debt is being repaid.

It is important to consider different factors to conduct activities aimed to develop endurance, including:

- Functioning of the higher centers of the Central Nervous System, since they determine the working capacity of muscles;
- aerobic possibilities of the body;
- anaerobic possibilities of the body;
- fitness level;
- movement technique or specific type of activity;

- characteristics of exercise (intensity, duration of resting intervals, type of rest, number of interventions, and others);
- health state;
- climatic conditions (temperature).

Rhythmic activities

The concept of rhythmic activities refers to the actions that link the sensorial receptors depending on the "coordination of motor actions in a particular time and space, as a response to the conditions and characteristics of the motor situation taken up" (Uribe, 2009, p. 120).

Importance of rhythmic activities

It enables work alternatives to the basic motor skills, creating new patterns of motor behavior.

It improves motor coordination, by economizing efforts, contributing with more moving fluency.

It helps improve communication among team members.

It provides plasticity and elegance to movements.

It is a means of expression.

Rhythmic activities are movements of the body performed through different sounds, creating a pleasant environment to the practitioners, enhancing the quality of physical activities, motor coordination, and the psychological benefits.

According to Cardona, J. (2018), “rhythmic activities are body actions made by humans, which express feelings, joy, happiness, decrease stress, and improve self-confidence and self-esteem”. (p.21). It is one of the main ideas about rhythmic activities.

These ancient activities are performed through rhythms that which favor and mobilize the body completely, with effects on all the muscles, first because of the vertical position that ensures motion in different planes and positions.

Interestingly, Ramón Leiva, E., Jiménez Pascual, L.; Yaniz Zanetti, J.; Herrera Arias, O. (2012) suggested a set of rhythmic activities for the physical training of the young, “(..) when body language is full of mimic and movements made through the music, it means that every step is dynamic, and will not only be used as a therapy, but as continuous-cardiovascular work that releases tensions and emotions, causes to lose weight, invigorates the muscles, creating an overall satisfactory wellbeing in the body”. (p.97).

Music is the element used to brighten or run different activities, so it is considered to activate or relax humans, depending on the style and musical structure used (Leman, M., Moelants, D., Varewyck, M., Styns, F., Noorden, L. & Pierre J., 2013).

Among the effects of music are the capacity to capture the attention, raise the spirit, unleash a variety of emotions, regulate mood, bring back memories, increase work or physical effort associated with an increase or decrease of the

heart rate, and the will of perseverance; it induces greater functioning states, and encourages rhythmic movement (Karageorghis, C. & Priest, L., 2011).

Likewise, music offers ergogenic, physiological, and psychophysical benefits, especially when the movements are synchronized to the music. In that direction, motivational music creates certain effects on the mood of people, whereas neutral music favors less oxygen consumption and a lower concentration of lactate (Terry, P., Karageorghis, C., Mecozzi, A., D'Auria, S. 2012).

Musically coordinated activities stimulate the brain, limb coordination is very stimulating, suggesting a much higher and integrated effort.

In that sense López-Cózar Ayala, R. (2019), emphasizes that music helps us create the optimum environment that we seek, the proper atmosphere, and its evocative power drives people into a particular attitude. They also warn about not overusing it, since it can generate an excessive dependence in practice.

Music can be used as a sound ambience, as a means of creative inspiration or a melodic guide. Using it to create ambience helps us create the optimum environment desired, the proper environment, and its evocative power drives people into a particular attitude. Music overuse can generate an excessive dependence to perform practice. Some applications can be relaxation and activities that require certain motivation from the participants.

Music is a valid element to develop expressive work, since there is no age and sex distinction to express ourselves. It is a delicate topic because some

individuals adapt well to it, while others show total refusal from the first moment. It means that the instructor needs to be alert when the rhythmic activity is accompanied by music.

Lastly, it can be concluded that dance is the queen of rhythmic activities by excellence, and it can offer a relaxing, pleasant, and socializing character. Additionally, its practice permits the maintenance of certain physical conditions, it develops psychomotor conducts, activates cardiopulmonary function, and influences memorizing and coordination processes demanded by rhythmic work.

Relation between rhythmic activities and resistance

Rhythmic activities are directly associated with rhythm; that is, music. According to Froseth, J. O. & Weikart, P. (2001), “the best way of learning how to follow the beat is by listening to music and interpreting it with the body; in other words, moving our bodies”. (p.76); therefore, rhythmic activities not only help improve endurance, but also a large number of physical capacities, as for instance, coordination, according to the same author.

The endurance capacity of practitioners develops through different rhythmic physical activities, so this study assumes the ideas of Gutiérrez, F. G. (2011) about the physical capacities: “In the set of components of motor skills, physical capacities are the most easily observed; they can be measured”. Consequently, endurance is a physical capacity that can be measured, so this study also assumes the criterion of Camelo, J. A. F. (2007). “Endurance is one of the

primary conditional capacities of humans, as it develops through a large amount of adaptative physiological processes, which, depending on age when the enhancement process begins (...)" (p. 83). It means that endurance can be enhanced through various processes.

Conclusions

Physical rhythmic activities using music has demonstrated to favor grater levels of endurance, and therefore higher life quality of practitioners.

Importantly, the biological, psychological, and sociological features of participants must be taken into account comprehensively; they should be analyzed to develop resistance, and accordingly, a creative process that meets the requirements of contemporary physical activity can be developed.

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Conflict of interests:

The author declares there is no conflict of interests in relation to this manuscript.