TARGET HEART RATE APPROACH FOR EXERCISE COMFORT TO IMPROVE BODY IMMUNITY

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ABSTRACT
Covid-19 has shocked the world and even WHO calls this outbreak a global pandemic. In order to prevent the spread and victims, the government issued a work from home policy so that all activities at home are at risk with sedentary activities. Exercise is an effort to reduce sedentary activity, reduce boredom, maintain health and even increase the immune system. However, what kind of exercise is right and good to do during a pandemic in order to avoid viruses and stay comfortable exercising. Therefore, this study aims to look at the Target Heart Rate Approach for Exercise Comfort in Increasing Immunity during the Covid-19 Pandemic. This research method uses a literature study with a descriptive analysis approach.

Keywords: Covid-19, Sports, Comfort, Immunity, Target Heart Hate

INTRODUCTION

The world was shocked by the outbreak of a new corona virus which was first discovered in Wuhan, China, which was given the name 2019-novel corona virus (SARS-CoV-2) also known as COVID 19 (Corona Virus Disease 2019). WHO issued a statement that this virus is a pandemic because it has attacked the whole world and causes high rates of infection, morbidity and mortality (Nomor et al., 2015). In Indonesia, the first positive case of COVID 19 was confirmed in March 2020 which was transmitted through human-to-human transmission. The steps taken by the government to be able to resolve this case are by applying clean living, social distancing, wearing masks and maintaining distance(Anggriawan, 2015). In general, clinical signs of COVID-19 infection are high fever, persistent cough, shortness of breath, diarrhea, and headache.

Viruses can be transmitted through droplets, aerosols, even through objects or surfaces that are contaminated with droplets from people who are sick and then the virus can enter the open mucosa (Lubis & Siregar, 2017). The COVID-19 pandemic has caused many changes in people's lives. Every activity is carried out at home such as studying, working, worshiping, even sports. Actually exercise can be done outside the home or inside the house. However, during the corona pandemic, exercise is very important because it has many health benefits but must be done carefully and considered carefully (Palar et al., 2015). Many people think that exercise is enough without looking at good exercise procedures. Sport is a physical activity carried out with certain rules to improve health, fitness, recreation and achievement.

The World Health Organization (WHO) encourages and makes exercise an inexpensive way to maintain health. In fact, exercise is an instrument to improve children's fitness, thinking ability, and self-confidence. The positive benefits of exercise are increasing psychosocial development, improving sleep quality, and even reducing dependence on alcohol. The effects of exercise can also be negative if done inappropriately and excessively, for example, it can cause fatigue, injury, or injury due to falling or being careless (Songsorn et al., 2021). Exercise that is done properly will definitely have a positive impact both

physiologically and psychologically. The adage "work smarter, not harder" applies to sports, especially when it comes to heart rate and target heart rate. The benefits of working at a Target Heart Rate (THR) are being able to exercise more efficiently and be more goal-oriented. By using the principle of target heart rate, it can help someone during a pandemic who is full of limitations in carrying out activities, especially sports, to be able to benefit from the sport (Elshazly et al., 2018). So the purpose of this literature review is to find out the target heart rate approach for the comfort of exercising in increasing body immunity during the COVID-19 pandemic.

METHODS

This research method uses literature studies in the form of library works in the form of scientific journals, books, articles, and statistical data. keywords in this literature study are coronavirus, exercise, immune system and target heart rate.

RESULTS

Sport during the corona pandemic is a necessity. Exercise can ward off boredom, fill free time, increase energy in carrying out daily routines, and improve health and even increase body immunity. Proper physical activity can reduce stress and anxiety by increasing endorphins levels after exercise. A study says that exercise is beneficial, but can also be harmful (France & Glick, 2021). Exercise is said to improve health. However, there are also people who die on the sports field due to a heart attack. The dose of exercise is different for each age and individual physical condition. The air condition during this corona pandemic also has two different sides. On the one hand, the concentration of nitrogen dioxide has decreased since the ban and restrictions on transportation. Schools and campuses were closed to reduce the spread of disease and mass quarantine (Faghy et al., 2021). Even carbon dioxide emissions have also decreased. However, the air is contaminated by droplets of COVID-19 sufferers who are still passing by doing various activities outside the home. In principle, the increased risk of being infected with the corona virus is contact with infected people or doing things that can lower the body's immune system. Excessive exercise suddenly can lower the immune system.

The benefits of regular exercise are not only useful in the management of chronic diseases which are the main comorbid factors in COVID-19 cases, but can also increase body immunity. Several studies have shown that exercise can improve immune function. The mechanism that causes an increase in body immunity, among others, is the stimulation of the innate immune system cell exchange and components between lymphoid tissue and blood (Düking et al., 2021). This stimulation will increase immunosurveillance against pathogens accompanied by a decrease in systemic inflammation such as IL-6, complement and immunoglobulins. The immune response to physical exercise is dependent on the intensity and duration of exercise. In moderate intensity exercise, with a duration of less than 60 minutes, there is an increase in immunosurveillance of immune cell subtypes that have therapeutic and preventive effects. The acute response to moderate exercise is an increase in the antipathogenic activity of macrophages that occurs concurrently with an increase in circulating immunoglobulins, anti-inflammatory cytokines, neutrophils, natural-killer (NK) cells, cytotoxic T cells, and B cells, all of which play an important role in the immune defense. Body (Elshazly et al., 2018).

Other studies also support that regular physical exercise in addition to improving the regulation of the immune system, can also delay the onset of immunosenescence. Although it

can increase the body's immunity, changes in the mechanical defense of the airways also occur in individuals who exercise. Exercise is thought to increase susceptibility to infection, but only in vigorous exercise. Viruses and pathogens in airborne droplets that make them susceptible to infection, one of which is upper respiratory tract infection. This vulnerability is influenced by airflow patterns and mechanical defenses of the upper airway. When exercising, there is a change in breathing patterns using the nose and mouth alternately causing the airways to become dry and reduce cilia movement. This will reduce the process of cleaning microorganisms from the respiratory tract so that it will be susceptible to upper respiratory tract infections. Several studies have found that physical exercise with too much intensity and too long has the potential to have a negative impact.

In Konig's study found in marathon runners, 13% experienced pain within 1 week after running the marathon while in runners who did not participate in the marathon only 2.2%. In another study also stated that the risk of upper respiratory tract infection is higher in athletes who participate in competitive competitions, strenuous physical activity and with mental stress burden (Konig et al., 2006). Heavy exercise loads, competition, physiological, psychological and metabolic stress are associated with immune dysfunction, inflammation, oxidative stress and muscle damage. Changes in immune cell function occur hours to days after exposure to vigorous and prolonged physical activity. in various compartments of the immune system, including mucosal tissue of the upper respiratory tract and lungs. So it is necessary to find the right sport so that it is not dangerous, especially during this pandemic. In principle, exercise is done regularly, with the right duration, intensity and type. Exercise increases the fight or flight stress response, meaning the body's response to stress will be better. The body has the ability to measure and react to a stress more effectively (Malm et al., 2019).

DISCUSSION

Aerobic exercise is an activity that depends on the availability of oxygen to help the process of burning energy sources so that it will also depend on the optimal work of the body's organs. This exercise is very needed during the pandemic because it optimizes the work of the heart, blood vessels, and lungs in transporting oxygen so that the process of burning energy sources can run perfectly and can even improve the body's immune system (Djalante, 2020). The right dose of exercise must pay attention to the frequency, intensity, and duration, but the dose of exercise that is not right and done excessively can cause several effects. Effects of inappropriate dosing and excessive aerobic exercise such as excessive weight loss, loss of excess body fat, increased resting heart rate, decreased muscle strength, increased submaximal heart rate, chronic muscle pain, fatigue, susceptibility to infection , insomnia. So an appropriate approach is needed in doing this exercise to avoid unwanted effects, one of which is by paying attention to the intensity of the exercise and the ability of the body.

The intensity of physical activity can be measured either in absolute terms (eg, energy expended) or in relative terms (relative to cardiorespiratory fitness). Using relative intensity when tracking the intensity of physical activity during this pandemic is more appropriate than absolute considering previously taking into account cardiorespiratory fitness which is closely related to physical activity (Dutheil, 2020). The relative intensity of cardiorespiratory fitness can be measured by maximal heart rate. Heart rate (HR) has historically been considered an objective measure of the intensity of physical activity. Heart Rate is the heart rate which is the number of heartbeats in one minute in units of Beat Per Minute (bpm). The heart rate value

will help in evaluating the exercise program while exercising, it can also be applied for early evaluation of heart health. Maximum heart rate (HR Max) is the heart rate that can be achieved during exercise and depends on age. Maximum heart rate can be estimated using several formulas. The most frequently used formulas are HR max = 220 - age (male), HR max = 226 - age (female), and HR max = 220 - half age (in obesity).

THR is the value of the Heart Rate to be achieved during cardio training that allows the heart and lungs to receive the benefits of a lot of cardio exercise done. This THR depends on a person's physical condition, gender and the intensity of the exercise performed. The American College and Sport Medicine (ACSM) established the Karvonen method as a standard for measuring THR for all forms of sports activity (Wilkins, 2000). The intensity is divided into several categories, namely: Zone I with an intensity of 50%-60% HRM for warming up and daily activities. Zone II (Moderate Intensity Exercise) with an intensity of 60% -70% HRM activities that burn more calories than Zone I, such as brisk walking and strength training. Zone III (Vigorous Intensity) with an intensity of 70% -80% HRM consisting of activities or exercises for endurance, for example jogging or race walking. Zone IV (Anaerobic Zone) or commonly called the Threshold Zone with an intensity of 80%-90%HRM. Zone V is the red line zone, where most people can't reach this zone only professional athletes. The intensity of this zone is 90%-100% HRM (Wilkins, 2000). Sylta et al's study entitled "From Heart-Rate Data to Training Quantification: A Comparison of 3 Methods of Training-Intensity Analysis" provides direct comparisons and practical conversions in determining exercise intensity using heart rate-based analysis methods.

CONCLUSSION

During the COVID-19 pandemic, it is very important to do sports to maintain fitness and health. In addition, exercise can prevent infection with the virus by increasing the immune system. However, many are still afraid to exercise because they see the safety and comfort in exercising. By using the THR concept in exercising, they feel more comfortable because they will know the capacity of the body, especially the heart, in carrying out the workload. In addition, by using the concept of pulse rate, one can consider the type of exercise to be achieved without relying on how long the exercise is carried out and how the exercise is done. Further research is needed to further prove whether this THR approach can be carried out and is widely beneficial.

SUGGESTION

For further research, namely so that it can be a further reference and can be developed even better than before.

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