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The Effects of Water Temperature on Swimming Performance

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Abstract

People participate in various competitive games such as swimming, which can also be done for leisure. When it comes to swimming, the temperature of the water determines the swimmer's speed and overall efficiency. The productivity of an individual is determined by the weather conditions during the time of the swimming event. Many studies have been carried out to determine the relationship between swimming and water temperatures. In swimming, there is a distinction between long distance swimmers and sprinters. The difference between them is caused by a variety of reasons that will be covered by this paper. Training is the core determinant of what type of swimmer one will become. For example, those who want to participate in sprint competitions should focus on long distance training. Also, notably, the speed of a swimmer is determined by the temperature of the water. Advisably, a swimmer should become familiar with the water temperature before they start swimming. A good swimmer is one who prepares in advance and understands the swimming environment. This paper seeks to examine the conditions that are favorable for a swimmer, focusing on the pool temperature effects on swimming performance through the investigation of previously published articles.

Keywords: Swimming, Water Temperature, Sprinter, Long-Distance Swimmer

Cold Water Effect

Under the situations when the water is less than 72, the blood vessels enlarge to give room for the warm blood to raise the body temperature. After some time, the body responds by closing the blood vessels to broaden and preserve the body heat. This response prevents internal organs from discontinuing functioning (Berthelot et al., 2015). However, the body cannot control blood flow for a long time. Eventually, the veins open, allowing the cold blood to reach the body organs, resulting in hypothermia (Daniel et al., 2013). The effects of water temperature differ according to the ability of an individual to withstand cold temperatures.

Comparing Cold Water to Warm Water

Warm water at about 82 degrees Fahrenheit can improve metabolism and swim speed. Colder temperatures of around 77 degrees Fahrenheit is better and safer during swimming because the body can adapt better to cooler waters than warm water (Russell et al., 1995). Swimming in cooler water decreases heat associated with fatigue and assists one to swim for a longer duration. The temperature should be regulated because frigid waters can cause shivering and eventually lead to hypothermia (Pineda, 1999). While swimming in warm temperatures, individuals should keep their exertion level low or swim for short periods to avoid heat exhaustion.

Ideal Swimming Temperatures

Water temperatures of 82 degrees Fahrenheit and below are ideal for appropriate and successful swimming (Ribeiro-dos-Santos et al., 2016). For medium exercise and leisure swimming, water temperatures ranging from 77 to 82 are best (Swim University, 2019). To evade dangerous waters, swim under the supervision of aquatic fitness professionals and always inquire about the suitable temperatures for a particular activity.

The warm waters may be detrimental to the participants due to the adverse effects on their bodies. For instance, some complications may include body overheating and muscle cramps once one is exposed to the warm temperatures (Pineda, 1999). Chemistry also proves that treating warm

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water is difficult as some bacteria such as algae survive under warm climate and, therefore, pose a threat in the commercial pools.

On the other hand, cold temperatures are problematic because they affect the swimmers' heart. Individuals with heart problems may suffer cardiac arrest. Similarly, when the temperatures are below 15 Celsius degrees, chlorine salt generators may fail to operate (Daniel et al., 2013).

Comparison between Sprinters and Long-Distance Swimmers

While long distance swimmers need to develop physical and mental strength, sprinters should have the strength and best conditioning (Barlowe, 2019). To develop the needed physical fitness, long distance swimmers' workouts appear to be grueling as they require more mileage. Whereas, multi sets of intensive exercise for the enhancement of cardiovascular fitness are fit for sprinters. In the same context, the energy needed in sprinting is entirely different when compared to long-distance swimming, meaning the training is also divergent (Sharp et al., 1982). In sprinting, the best technique is required more as one needs explosive speed for fast and freestyle swimming.

Further, swimming is an aerobic activity that relies on a regular supply of oxygen. Thus, energy is needed to keep moving in endurance sets. However, sprinting does not depend on aerobic metabolism as in long-distance swimming. Long-distance and sprinting require different levels of energy, thus, if one is set to train for long-distance, they cannot prepare for short-distance (Brewster, 1963). Subsequently, it is easy to cover up mistakes in the long distance while sprinting does not allow room for errors.

Since long distance and sprint swimmers need different fibers such as slow-twitch and fast-twitch fibers, respectively, a high volume of training may work for only long-distance swimmers. Long distance training does not assist in producing fast-twitch fibers, which are critical for sprinters (Daniel et al., 2013; Rushall, 2019). Therefore, for sprinters, high volume training might lead to fast convulsion fibers too slow which are very crucial for this activity. A person who is preparing for sprinting does not need long times of exercise, as this will be of less value to the calling. However, for long-distance swimming, the more time spent on the water, the more the benefit.

Swimmers' Preparations in Regards to Water Room Temperature

Warming-up before swimming plays a critical role in facilitating effective swimming results. The warm-ups encompass definite and non-definite movements of the body, which stimulate metabolism and heat generation activities for appropriate preparations before swimming activity (Daniel et al., 2013). Therefore, stretching exercises are essential to reduce excessive straining of muscles, increase the movement of joints, prevent joint and muscle injuries and mitigate possible resistances to change during swimming. Taking cold showers for a few weeks before swimming in cold water helps swimmers to familiarize themselves with the cold sensation (Souto et al., 2017). Although the first encounter with cold water can cause psychological and physical shock, the body will acclimatize gradually to avoid fast heartbeat and adrenaline generation. Increased heartbeat and adrenaline generation can lead to hyperventilation in cold water. Taking warm drinks and foodstuffs before swimming in cold water helps swimmers to warm up and avoid discomfort arising from cold water.

Right swimming temperatures of less than 70 degree Farenheit are critical for cold water swimming activities. Stretching body muscles for approximately 20 minutes before swimming helps the body to absorb shock effects, especially when the swimmer comes into contact with cold water (Shephard et al., 1974). The muscles gain warmth and heartbeat increases due to increased blood flow within the blood vessels. Some of the activities which stretch muscles include skipping a rope, twisting of shoulders, jogging, continuous jumping, lifting of feet from behind to reach the buttocks and facing up while breathing continuously (Strass, 1988).

Stretching exercises such as twisting shoulders and lifting of feet help the body muscles loosen before cardiovascular muscles warm-up to pump blood within the blood vessels at high speed. This trigger increased metabolic activities to prepare the body to adjust to low water temperatures. Facing up and breathing through the mouth prepares swimmers for cold water swimming (Brewster, 1963). Lifting the face up and repeated breathing is required to ensure that the swimmer does not dive into the cold water, hence, preventing the body from shock. Wearing correct wetsuits insulates the body against cold temperatures and muscles and joints to contract and relax efficiently. The neoprene also increases buoyancy by maintaining the body in position on the water surface, and this helps the swimmer to rest by using little energy while floating on the water surface. The suits should be around 4-6mm thick with closed and taped seams to regulate body temperature, especially during coastal swims (Myer et al., 2015).

Building strength before swimming in cold water is essential preparation. Power is built up by swimming comfortably for approximately 10km in the cold water; although the cold water, in conjunction with harsh cold water currents, requires a lot of energy and lower strength. Additionally, at the same temperature, cold water absorbs heat from the body 25 times more than cold air. Therefore, the respiratory system and the heart are forced to overwork to recover the heat lost, hence, making the body to tire excessively. Swimming for short distances and a short period in shallow pools helps swimmers to gain more strength and increase the swimming duration slowly. Before swimming in cold water, splash the cold water on the face for about 10-15 seconds to allow the face to cool down to attain the current water temperatures to adjust and absorb shock effects.

Swimming in warm water does not require heat-generating activities; instead, it requires events that drive heat away from the body. Swimmers need to participate in non-strenuous undertakings such as sleeping for a few weeks before the swimming event to reduce body metabolism and heat generation activities. This preparation makes the muscles relax and maintain body temperatures at optimum levels.

Taking warm showers before swimming facilitates immediate adjustment of the body to prevailing warm water temperatures. Warm baths help the cardiovascular muscles to work optimally, hence, reducing excessive heartbeats and overworking respiratory system. Wearing light clothes plays a critical role in preparation to warm water swimming. Light clothes allow air circulation by releasing excess heat from the body to the environment, reducing the high chances of overheating (Brandon, 2019; Mackenzie, 2019; Rushall, 2019). Thus, the swimmer is safe from suffocation.

Cold drinks and foods serve an essential purpose in preparing the swimmer to adapt to warm water effects. Consumption of cold drinks and foodstuffs help swimmers lower body temperatures and reduce warm sensation associated with warm water. The mutual interaction of the cooling effects from the cold drinks and warm water brings a cooling effect to the body. Thus, the swimmer relaxes deep in the pool of water. Additionally, before swimming in warm water, swimmers should sprinkle their faces with warm water for approximately 15-20 seconds to allow the face to warm up and familiarize with the current warm water temperatures (Strass, 1988). Swimming in warm water for long distances before the actual swimming event makes swimmers gain confidence and acclimatize to several ranges of warm water temperatures.

Conclusions

In conclusion, swimming is a fascinating action, which may be more attractive under conditions when individuals are aware of their own limits and goals throughout the exercise sessions. Thus, they are in a position of achieving their goals by training appropriately. Individuals cannot prepare for sprinting when they target at elongated distance swimming, as the move cannot offer the required stamina for the competition. To avoid accidents, swimmers should know and listen to their bodies' limits and understand different water temperatures to avoid associated risks.

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