



The Siamese Twins of a Healthy Life: Physical Activity and Positive Emotion

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Abstract. Due to a series of influences brought about by the increase in social pressure, the physical health indicators are decreasing year by year. People need a certain amount of physical activity to maintain a positive mood. This article uses a review and qualitative analysis to analyze the impact of physical activity on positive emotions, which can balance people's emotional problems while maintaining a healthy life.

Keywords: Physical Activity, Positive Emotion, Depression Disorder, mental health

1 Introduction

In today's society, as a result of the increased stress and workload brought on by family, work, or COVID 19, people's physical health deteriorates to varying degrees because they don't get enough rest or do the right kind of physical activity. When the physical condition is worse than usual, not only does the immunity capacity decline and negatively impact human's health, but it may also have a direct or indirect impact on the emotions or feelings. Previous research has suggested that maintaining regular physical activity increases pleasant-activated feelings. Participants who participate in a duration of 4-32 weeks of exercise intervention programs have different levels of improvement in feelings, energy, and mood [1]. Thus, it can identify that physical activity is one of the essential elements in influencing and maintaining positive human feelings. The purpose of this article is to analyze the influence and uses of positive feelings brought by physical activity, both biological and psychological and to help people understand the necessity of physical activity to ensure the development of society.

The biological benefit of physical activity is obvious and significant to the human body. Skillful use of techniques in restriction exercises such as eccentric contraction, concentric contraction, and plyometrics can improve bone density, strengthen muscles, and cardiopulmonary function as a long-term development [2]. Meanwhile, ensuring enough high-quality aerobic exercise such as long-distance running, cycling, swimming, and hiking is able to enhance an individual's hormonal, neurological, hemodynamic, metabolic, and respiratory function in a positive direction [3]. In addi-

tion to disciplinarian high-intensity exercise, low-intensity daily exercise also offers people plenty of benefits that may not be noticed. Appropriate slow walking or occasional sports activity are able to improve sleep quality, metabolism, appetite, and the performance of diet and decrease the risk of having the disease [4].

Having a positive feeling or emotion is an instinctive requirement for most people. Positive emotions can usually be divided into four types: pleasure, interest, satisfaction, and love. These four emotions encompass the positive feelings that humans experience in most situations. Undeniably, compared with all human emotions, positive emotions only occupy a small part, but they bring benefits to the human body that other emotions cannot provide. There are various benefits brought by having positive emotions from different dimensions. It's able to broaden the scope of attention, cognition, and action ideologies. Moreover, positive emotions can build physical, intellectual, and social resources behaviorally [5]. Thus, maintaining a positive attitude is one essential condition for promoting human revelation. This also proves that it is indispensable to achieve this condition through physical exercise.

2 Mental health

2.1 Treatment of Depression Disorder

Judd et al. (2013) describe how depression disorder is one of the common psychological diseases that causes a large group of people in human society to suffer from multiple grievous effects, such as aggressive reactions, suicide intentions, and emotional disorders [6]. In 2017, there were about 163 million people who had Depression disorder all around the world [7]; in the United States, more than 7% of the American population has or has Depression disorder; meanwhile, the teenager incidence rate kept climbing [8]. The consequence of depression disorder disturbs the patient's mental and physical health and also influences society's development. In this severe environment, it is an urgent matter to find the proper treatment for depressive disorder. Psychotherapy, medication, and electroconvulsive therapy are the primary treatments for treating depression disorder patients at different stages [9].

However, besides these major depression disorder treatments, physical exercise and activity have also been identified as recommended potential treatments, which are included in mild to moderate severity illness guidelines [10]. A single physical exercise/activity session has a beneficial neurobiological effect and can even be successful in reducing treatment-resistant depression [11]. For example, in four months of medical experiments, physical activity presented similar effects on relieving depression symptoms compared to antidepressant medications; moreover, research suggested exercise was associated with a higher remission rate than the placebo control condition [12]. Meanwhile, the previous meta-analysis has supported this result by concluding that exercise therapy increases response/remission in clinically depressed patients compared with no treatment or placebo conditions [13].

Another reason for advocating physical exercise as a treatment for depression disorder is that participants' emotional fluctuations are more positive and symmetrical during moderate-intensity exercise. As we know, during the onset of depression, pa-

tients do not have the ability to control their emotions, which may lead to some dangerous behaviors and even affect their physical health of themselves and others. After systematic exercise training, patients can be taught to control their emotions and reduce the impact of emotional fluctuations. Under intense training, however, there is more variability in patients' emotional responses. Thus, while high-intensity training brings a positive impact on a patient's cardiorespiratory fitness, moderate-intensity exercise offers more benefits in the long term [14].

2.2 Anesis Negative Emotions

Physical exercise or therapy is not only able to be processed as a treatment for Major Depressive Disorder, but it is also one of the most effective ways to prevent and interfere with the production of negative emotions or feelings. Anxiety is a type of negative emotion that makes people feel fear, uneasiness, and nervousness. Daily pressures frequently create it.

However, without a positive attitude and proper treatment, anxiety may transform into a disorder and cause negative influences on studies, relationships, and daily performance. There are many causes of anxiety. However, physical exercise can help ordinary people effectively prevent event anxiety or relieve the aggravation of anxiety patients. Meanwhile, exercise also presents an obvious potential protective effect against agoraphobia and PTSD (post-traumatic stress disorder) patients [15]; in spite of this, there is still a lack of evidence for protection against other anxiety-related disorders, such as panic, specific phobias, OCD, or social phobia.

Until today, the potential underlying mechanism of exercise's protective effect on anxiety remains unexplained. However, we can approach a simple analysis from the perspective of other disciplines. Biologically speaking, exercise promotes brain-derived neurotrophic factor, or balance of inflammatory/anti-inflammatory markers, or even decreases interleukin 6, which all elements may influence anxiety [16]. From a psychological perspective, physical activity can reduce sensitivity to anxiety, which is the key element in developing and maintaining anxiety and other related disorders [17]. Moreover, physical activity can improve self-efficacy to control potential threats [18]. Thus, the correlation between the affection for physical activity and anxiety cannot be described as cause and effect simply but pleiotropic. However, the idea that the higher the level of exercise, the lower the risk of anxiety is unquestionable.

3 Physical activity

3.1 Biological Effects of Physical Activity

Exercise speeds up the heartbeat and makes it possible for humans to inhale more oxygen, which then travels via blood vessels to the brain, where it prompts the production of additional hormones and improves the environment for cell growth. Additionally, physical activity raises levels of synaptic proteins (synapsin and synaptophysin), glutamate receptors (NR2b and GluR5), and several classes of growth factors, including brain-derived neurotrophic factor (BDNF) and insulin-like growth factor-

1[16]. It also promotes synaptic plasticity in the hippocampus and electrophysiological properties [19]. These changes reduce the number of baroreceptors in the hippocampus, which minimizes the effects of stress hormones on the brain, thereby reducing the negative emotional effects of stressful experiences [20].

According to neuroscientific research, happiness is regulated by a number of brain neurotransmitters, including dopamine, serotonin, norepinephrine, and endorphins, according to neuroscientific research. Moreover, exercise does have some positive effects on those neurotransmitters that lead people to experience a more positive mood. For instance, running is able to evoke Parkinson's disorder patients' dopamine release in the caudate nucleus [21], swimming training enables rats to enhance the sensitivity of the serotonin receptors along with the subsensitivity of serotonin autoreceptors [20], and anaerobic response intensive running increases endurance athletes' concentrations of β -endorphin and ACTH in plasma [22].

3.2 Delayed Gratification of Physical Activity

Delayed gratification describes when people are willing to receive more valuable long-term results in exchange for their resistance to the immediate temptations and small benefits. Moreover, the reward one receives through delayed gratification makes it more

meaningful in the long run. For example, when smokers are trying to quit smoke, they may have to suffer from a nicotine withdrawal reaction. However, after quitting successfully, they will earn healthy lungs, a lower risk of having cancer, and other privileges in the long term. Undeniably, delayed gratification also plays a vital role in physical exercise. As mentioned in the article earlier, the benefits of physical activity are varied and self-evident, so when people realize that exercise is a type of investigation into their health future, they have more perseverance and interest in getting involved in those activities. Moreover, due to delayed gratification, individuals significantly gained more satisfaction and improved well-being subjectively from these exercises [23].

In addition to the simple physical benefit to our bodies from exercise, another reason that motivates many citizens to start exercising is to gain the benefit or praise from a shaped body, such as becoming a model, gaining attention from other people, or being able to handle heavy labor work. In order to have a better body shape, participants need to maintain a schedule of anaerobic and aerobic exercise for a long time; at the same time, they must restrict nutrients and calorie intake. Also, previous research has suggested that praise is able to make individuals feel more positive, increase consistency, and enhance their self-learning ability [24].

That way, when people finally get the job, they want or the compliments they get from others, their psychic gratification may be boosted to the maximum with the help of delayed gratification. Nevertheless, psychic gratification is also on behalf of the fulfillment of emotions and motivations, which is also identified as satisfying the condition of happiness of the "drive model of the mind" identified by Freud [25].

4 The Relationship between Physical Activity and Positive Emotion

Previous studies have shown clear evidence that intense exercise has a positive effect on emotions [26]; at the same time, maintaining daily exercise will also significantly improve happiness and sleep quality [1]. But many people may still make the mistake of thinking that this kind of influence or promotion is one-sided. The relationship between physical activity and positive emotions is mutually beneficial, and different changes in emotions can further affect physical activity performance, rather than just bringing about positive emotions due to exercise. In baseball games, batters will have negative emotions due to the pressure brought on by the laughter of the audience, which leads to a decline in batting accuracy [27].

When people have positive emotions, each thought and attitude will be different from those with negative emotions; for the same reason, when people have such thoughts, the behaviors and reactions derived from those thoughts will also be greatly different. When students have a more positive attitude toward learning and less stress about learning through the flipped classroom, their scores have significantly improved [28]. As the idea of "teleology" is mentioned in Alfred Adler's Individual Psychology, a purpose has been created that is influenced by an individual's attitude will affect the choice and behavior to accomplish the purpose. Therefore, when we take a positive attitude towards everything in life, the results will be significant compared to a negative attitude. For example, when colorectal cancer patients have positive emotions after completing chemotherapy, their physical health status, mental condition, and social functioning scales are much better than other patients.[29].

When we can clearly understand and properly use the interaction between physical activity and positive emotions, we are able to combine them to form a virtuous circle to ensure further that we have a healthy body and life.

5 Limitations

Despite considering the use and advantages of physical activity on emotions from a variety of angles, the article has some limitations. First off, neither the mutual influence between physical activity and emotions nor the age gap between them is considered or examined in this paper.

Another bias that was not mentioned in the article was the differential of emotional change between males and females. For various reasons, men and women encounter the same pressure or problems producing emotional changes, or physical projection is also not the same.

6 Conclusion

Maintaining positive emotions is essential to living a healthy life. Additionally, more and more studies and articles are highlighting the value of exercise in maintaining

both physical and mental health. We are astounded by the impact physical activity has had when we consider the history of the effects of mental illnesses. Proper physical activity can boost people's emotions while not putting too much financial strain on them or the environment. In the meantime, exercise has additional advantages like lowering stress levels and treating mental illnesses. Thus, it's necessary for individuals to find a balance between physical activity and mental health. Everyone can guarantee a healthy body for the rest of their lives in this way.

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