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The Moderating Effect of Physical Exercise in Anxiety Disorder: A review

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Abstract

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Along with drug interventions, physical activity (PA) was found to be beneficial to treat a wide range of mental pathology (e.g., depression, mood disorders). However, in the case of anxiety disorder (AD) treatment, studies reported inconsistent findings depending on the exercise type (e.g., acute or chronic exercise, aerobic or anaerobic exercise) among clinical and non-clinical population. The purpose of this article is to present a systematic review about the moderating role of exercise type in AD among clinical and non-clinical population. Searches included SPORTDiscus, PubMed, Google Scholar databases. Eighteen full text articles were retained for the review, because they were written in English and published within the last five years. The review reported the moderating effect of PA on AD, in the sense that chronic (endurance) exercise appeared to be more beneficial for reducing AD than acute bouts of exercise, and that moderate aerobic exercise reduced AD effectively. Also, relaxation and mediation exercise (e.g., yoga) appeared to reduce AD. According to the scientific literature, PA appears of interest to treat AD. Further studies are necessary to examine in depth the relationship between PA and AD.

Keywords: Physical activity; anxiety; meditation.

1. Introduction

Psychological disorders have become the main focus in the world over the past decade, in which it is affecting mostly half of the population. According to the World Health Organization, anxiety, depression, somatic symptoms, and high rates of comorbidity significantly contribute to the coexisting risk factors (e.g., negative experiences, stressors we face in life and gender-based role). Anxiety is a type of mental disorder that contributes significantly to coronary heart disease (CHD) and cardiac morality (Chang et al., 2013). Moreover, anxiety presents a state of worry that appears in the lack of

real or unreal danger (Buckworth, 2013). Although it is a normal response to an imagined or a real risk, anxiety is distinguished from fear, which is known as a brief emotional reaction to a threatening stimulus. However, in most cases of phobias, anxiety lasts much longer than fear. Anxiety components include cognition, emotional responses, and physiological changes that are stimulated together when the individual perceives the situation as threat (Buckworth, 2013). Therefore, anxiety is considered an illness when its behaviours cause pain that impairs social behaviours, and/or normal physical functioning (Velickovska et al., 2014). Anxiety may appear to be a structural feature of the individual's characteristics, although it could be a state that is related to a particular situation in life. Furthermore, there are 5 types of anxiety disorders: phobias, obsessive compulsive disorder, social phobia, posttraumatic stress disorder, and generalized anxiety disorder. The purpose of this paper is to show the beneficial effects of exercise in moderating anxiety among clinical and non-clinical population.

2. Materials and methods

Literature search was performed on the SPORTDiscus, PubMed, Google Scholar using the following keywords: aerobic exercise and anxiety, mental disorders and anxiety, exercise effects on anxiety, dose-response of exercise and its effects on anxiety. Eighteen full text articles were retained for the review, because they were written in English and published within the last five years, whereas 40 articles were excluded either because not written in English, or the publication dates were not up-to-date. Furthermore, some articles were only used for references that related to anxiety and were published before the year 2011. Finally, recent relevant data was retained from the full text articles that exclusively supported the role of meditation in treating anxiety disorders among clinical and non-clinical population.

3. Results

3.1. Physical activity moderates anxiety disorders (AD)

According to Strohle et al. (2009), physical activity may play a crucial role in dealing with anxiety disorders. However, physical inactivity is considerably associated with greater levels of anxiety sensitivity, and can affect the severity of panic disorder. Furthermore, Thorsen et al. (2005) have stated that people who spend less than one hour weekly in law intensity physical activity are considered as physically inactive. Hence the prevalence of raised anxiety symptoms is higher in this population compared to physically active people. Smits et al. (2008) stated that engaging in a moderate intensity aerobic exercise has reduced effectively fears of anxiety symptoms for young adults that scored high in a test of anxiety sensitivity. Acute submaximal exercise was shown to reduce the frequency of severity of anxiety, and panic symptoms after providing the panic-inducing drug cholecystokinin in both healthy people and panic patients (Strohle et al., 2009). Therefore, acute exercise can decrease effectively state anxiety, as traditional medication usage (Buckworth, 2013). However, Nibbeling et al. (2012) found that 10 weeks of engaging in aerobic exercises were more effective than a placebo pill among university students with state anxiety, but less effective than medications. Furthermore, Wipfli,

Rethorst and Landers (2012) state that exercise role is moderately effective in treating anxiety, because most of the interventions done in researches have chosen non-clinical population in their studies. Herring et al. (2012) found that women who were suffering from anxiety disorders, or were being treated with antidepressant medications have reduced significantly the worry symptoms compared to the control group, after participating in six weeks of aerobic and resistance training. Merom et al. (2008) found that patients diagnosed with panic disorder, social phobia, and generalized anxiety disorder have experienced a significant reduction in anxiety after complementing a home-based walking program. Therefore, Jayakody, Gunadasa and Hosker (2014) supported the previous evidence finding that light exercise such as walking performed by patients has reduced anxiety symptoms more than the jogging group. Furthermore, Arazi et al. (2012) found a positive correlation of aerobic exercise and the reduction of anxiety, stress and depression after a 10-week intervention among university students with anxiety symptoms. Interestingly, Nibbeling et al. (2012) have found that trait anxiety levels are elevated significantly in women who are overweight or obese, and in men who have class 3 obesity compared to people with normal body mass index (BMI). Although most of literatures support the role of treating anxiety in non-clinical population, little evidence has supported the effectiveness of exercise in clinical population with anxiety disorders. Therefore, patients still have to take medications along with exercise in order to have beneficial effects in health status. According to Morgan et al. (2013), exercise may be used as a strategy to enhance recovery, a stress management tool of the side effects of some medications. Additionally, it improves health and well-being.

3.2. Meditation exercise effects on anxiety disorders (AD)

This part presents the effects of exercise with different intensities, and its relation to reduce trait or state anxiety among clinical and non-clinical populations accordingly to recent literatures. First, perceived state or trait anxiety among patients and non-patients was reduced significantly after an acute bout or chronic exercise sessions. Second, the scientific literature limited its scope and emphasized mainly aerobic training, whereas little evidence was supported by scientific literature on the role of resistance training, and its effects on anxiety. Interestingly, one of the studies investigated the influence of a Tai Chi Chung (TCC) program on reducing anxiety symptoms. According to Chang et al. (2013), engaging in TCC reduces stress hormones, and promotes well-being, due to the marked reduction in state anxiety. Therefore, engaging in a TCC program for 12 weeks decreased dramatically anxiety levels. Prolonged respiratory expiration combined with slow breathing leads to a significant reduction in physiological and psychological arousal in an anxiety-provoking situation (Cappo & Holmes, 1984). TCC program consists of slow body movements, with deep breathing that eventually will lead to an increase in muscle strength and relaxation (Chang et al., 2013). Therefore, inducing a relaxation exercise session will immediately reduce state anxiety. Furthermore, TCC program is a combination of both aerobic exercise, and strength exercise due to increased breathing, and slow movements that sometimes require the body to move to different directions, and hold body weight in specific positions consistently. Furthermore, self-induced relaxation technique may result in enhancing dramatically a personal sense of control over anxiety (Kim, Yang, & Schroeppel, 2013). TCC program follows the recommendations of the scientific literature in implementing both aerobic and strength training

programs to reduce anxiety status. According to Buckworth (2013), moderate to vigorous exercise intensity (of 60%-80%) of maximal strength, or aerobic capacity, 3 times a week as frequency, contributed significantly to the reduction in anxiety symptoms. Furthermore, TCC can be defined as a psychotherapy that can be used to treat anxiety. Hence, according to Buckworth (2013), cognitive behaviour, and behavioural aspects are used to treat anxiety disorders by educating patients for the deep breathing technique. Furthermore, cognitive behaviour can be improved by enhancing the internal thoughts of an individual when dealing with a situation that provokes anxiety. Moreover, according to Kim, Yang and Schroeppel (2013), 11 university students aged from 18 to 46 years old, who self-reported anxiety symptoms, were engaged in a Kouk Sun Do (KSD) session, during which they experienced its acute relaxation effects after a 70-minute workout. Therefore, KSD resulted in a mind-body relaxation which contributed significantly to the reduction of trait and state anxiety. Furthermore, a recent study has supported the role of meditation exercise "Danhak" in regulating anxiety levels among females with breast cancer undergoing radiation therapy (Yeon et al., 2013). Danhak is a traditional Korean meditation exercise. In particular, it is a form of meditation that requires the individual to focus on the body, while relaxing the mind and body through natural rhythmic movements such as lightly shaking one's head side to side. Furthermore, anxiety levels were reduced effectively after a 6-week intervention of Danhak exercises among the tested group, whereas in the control group anxiety levels increased dramatically while undergoing a radiation therapy for female with breast cancer (Yeon et al., 2013).

4. Discussions and conclusions

The literatures supported the role of aerobic exercise in treating anxiety, but in most cases in a non-clinical population. Therefore, according to Bixby and Hatfield (2011), somatic anxiety increased dramatically with no change in the cognitive anxiety while performing a vigorous intensity exercise (<75% of VO_2max). However, both rates decreased dramatically below baseline levels during the recovery phase. These findings indicate that performing an aerobic exercise in both moderate and high intensities will contribute positively to enhance anxiety symptoms. Furthermore, Vancampfort et al. (2011) concluded that: 1- perceived subjective wellbeing increased dramatically after engaging in yoga, and 2- an acute bout of aerobic exercise for 20 minutes noticeably reduced the psychological stress and state anxiety in patients with schizophrenia. Although aerobic exercise seems to have the capacity to moderate anxiety symptoms, four recent studies (Fiore, Nelson, & Tosti, 2014; Kim, Yang, & Schroeppel, 2013; Chang et al. 2013, Vancampfort et al. 2011) supported the role of inducing relaxation exercises such as TCC, KDS, Danhak, and yoga exercises. These exercises contributed significantly to enhance the overall wellbeing, and reduced anxiety especially for patients diagnosed with anxiety disorders. However, there is little evidence in regards of safety and/or contradictions with respect to people with psychiatric disorders and yoga participation. Furthermore, aerobic exercise also has beneficial effects not only on psychological wellbeing, but also on physiological capacities of individuals. According to Arazi et al. (2012), aerobic exercise promotes cardiorespiratory function despite its intensity. Therefore, a combination of relaxation exercises and aerobic exercises will improve trait and/or state anxiety along with physiological benefits among both populations.

In conclusion, anxiety is considered as a normal response to a situation that is perceived as threat and all people across the universe have experienced anxiety. However, anxiety could be a life-threatening situation if it lasts for prolonged periods, where a person cannot distinguish between real threat and/or imagined threat. Therefore, countless literatures tried to investigate deeply anxiety, and how it could be moderated through either the usage of medications and/ or exercise. Thus, anxiety reductions were detected after acute exercise consistently in most of the literatures, in both clinical and non-clinical populations. Furthermore, aerobic exercise seems to influence anxiety positively. However, new evidence has revealed that anti-stressor exercises (relaxation exercises) are recommended to reduce anxiousness rates among the two different populations. Further studies should be implemented in the future regarding the role of resistance training and its relation to anxiety. It is recommended to focus more on treating anxiety among patients who have anxiety disorders rather than non-patients to contribute to enhanced health and lifestyle behaviours among the society.

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