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A Review: The Relationship Between Exercise and Anxiety Levels

Hussein Ali Abdulabbas Alhusseini[1], Zaman Ahmed Hrefish[2] & Mohammed Abbas Hussein[3]

[1,2,3]*Faculty of Nursing, University of Babylon, Hillah, Iraq.*

Corresponding Author: Hussein Ali Abdulabbas Alhusseini, **Email:** Nur.hussein.aliabd@uobabylon.edu.iq

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ABSTRACT

Anxiety disorders are among the most common challenges of mental health, impacting people across all demographics and lessening overall quality of life. While traditional managements, such as cognitive-behavioral therapy (CBT) and selective serotonin reuptake inhibitors (SSRIs), are commonly used, these interferences may not be appropriate for everyone due to personal preferences or side effects. Therefore, there is increasing interest in non-pharmacological substitutes like exercise. This review inspects the multifaceted relationship between anxiety and exercise, framed within the biopsychosocial model, which studies the interplay of social factors, psychological, and biological. Exercise has been shown to lessen anxiety symptoms by chronic and acute mechanisms, including physiological changes like neurotransmitter modulation, cognitive benefits such as improved executive functioning, and emotional advantages like enhanced self-efficacy and mood. The review highlights both immediate and long-term anxiolytic effects of exercise, supported by neurobiological and psychosocial evidence. However, questions remain about the most effective exercise regimens for anxiety reduction and the mechanisms through which they work. Understanding these aspects is crucial for developing targeted exercise-based interventions to promote mental health.

Keywords: Anxiety**,** Exercise**,** Non-pharmacological treatment**,** Neurobiology**,** Psychosocial factors

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INTRODUCTION

Background and Rationale

Anxiety disorders are amongst the prevalent mental health disorders international, distressing people across various demographic crowds (World Health Organization [WHO], 2017). Characterized by fear, extreme worry, and physiological provocation, conditions of anxiety can considerably damage an individual's quality of life and functioning. Managing anxiety symptoms with pharmacological treatments such as cognitive-behavioral therapy (CBT) and selective serotonin reuptake inhibitors (SSRIs) are usually used, due to side effects, personal preferences or contraindications these interferences may not be appropriate for all people (Hofmann et al., 2012).

Assumed limitations of traditional managements, there is rising interest in discovering alternative methods for handling anxiety, including lifestyle interferences for example exercise. Physical activity has long been documented for its countless profits for physical healthiness, including reduced risk of obesity, cardiovascular illness, and diabetes. Though, developing evidence proposes that exercise might also have a positive influence on outcomes of psychological health, mostly in relatively to anxiety (Stanton & Reaburn, 2014).

The justification for examining the relationship between anxiety levels and exercise stems from numerous theoretical perspectives and experiential outcomes. Biopsychosocial models of anxiety suggest that anxiety disorders arise from a multipart interaction of social factors, biological, and psychological. From a biological side, exercise has been revealed to moderate neurotransmitter structures concerned in regulation of anxiety, such as norepinephrine, endorphins, and serotonin. Mentally, exercise can act as a meditation and distraction from negative thoughts, enhance self-efficacy and self-esteem, and control over one's atmosphere and deliver a sense of mastery. Generally, contribution in group-based exercise courses can stand-in connectedness and social support, which are protecting elements to regulate anxiety (Rebar et al., 2015).

In spite of the preliminary evidence and theoretical rationale that supports the possible profits of exercise for anxiety, a number of questions persist unanswered. For instance, what kinds and intensities of physical training for decreasing anxiety symptoms are most operative? Are there subgroups or specific populations that may stem bigger benefits from physical training interferences? What are the causal mechanisms through which workout employs its effects on

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anxiety? Talking about these questions is vital for updating evidence-based interferences and public health initiatives meant at decreasing the load of anxiety illnesses.

Biopsychosocial Models of Anxiety

Anxiety disorders remain multifaceted conditions swayed by a mixture of social factors, biological, and psychological, as planned by biopsychosocial models (Barlow, 2000). These models suggest that anxiety starts from the interface of hereditary predispositions, environmental stressors, neurobiological processes, and cognitive susceptibilities (Barlow, 2000; Craske & Waters, 2005). Considering the interplay between these elements is essential for designing effective interventions and comprehensively addressing anxiety symptoms.

Biological Factors: Biological factors show a significant role in the causes of anxiety illnesses, with genomic dispositions contributing to susceptibility (Hettema et al., 2001). Family studies and Twin have constantly confirmed heritability estimates for anxiety illnesses, indicating a substantial inherited component (Hettema et al., 2001; Smoller et al., 2008). Neurobiological study has concerned dysregulation of neurotransmitter systems, including norepinephrine, gamma-aminobutyric acid (GABA), and serotonin, in the pathophysiology of anxiety (Nutt, 2002). Changes in brain sections such as the prefrontal cortex, amygdala, and hippocampus have also been related with heightened anxiety answers (Etkin & Wager, 2007).

Psychological Factors: Psychological issues contribute to the exacerbation and maintenance of anxiety indications through dysfunctional coping strategies and maladaptive cognitive processes. Cognitive models of anxiety highlight the role of negative cognitive biases, such as selective attention to threat, overgeneralization, and catastrophizing, in amplifying anxious replies. Persons with anxiety complaints may display avoidance behaviors, excessive worry about future events, and distorted perceptions of threat aimed at reducing distress. Moreover, character traits such as behavioral inhibition and neuroticism have been recognized as danger factors for the expansion of anxiety illnesses (Mineka & Zinbarg, 2006).

Social Factors: Social factors include socioeconomic disparities, cultural influences, environmental stressors, and interpersonal relationships that contribute to the maintenance and beginning of anxiety disorders (Alonso et al., 2004). Adverse childhood involvements, including neglect, trauma, and attachment disruptions, increase the risk of rising anxiety illnesses later in lifespan (McLaughlin et al., 2010). Social support, in contrast, serves as a defensive factor against anxiety by providing emotional reassurance and shielding the impact

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of stressors (Thoits, 2011). Cultural norms and societal prospects concerning gender achievement, roles, and social relations also power the appearance and understanding of anxiety symptoms (Kirmayer et al., 2015).

In summary, biopsychosocial models offer a complete framework for interpreting the complicated nature of anxiety illnesses. By considering the interplay of biological, psychological, and social factors, clinicians and researchers can develop holistic approaches to assessment, treatment, and prevention that address the complex needs of individuals with anxiety.

The Role of Exercise in Anxiety Regulation

Exercise has emerged as a hopeful non-pharmacological intervention for indorsing emotional well-being and improving symptoms of anxiety. Studies suggest that engaging in steady physical activity can have a positive influence on numerous aspects of anxiety regulation, including emotional reactivity, cognitive assessments, and physiological arousal (Asmundson et al., 2013; Salmon, 2001).

Physiological changes: Exercise tempts changes in the autonomic nervous system, leading to rises in parasympathetic nervous system action and decreases in sympathetic nervous system action, resulting in a state of physiological relaxation (Dinas et al., 2011; Smith, 2013). Aerobic exercise, specifically, has been shown to raise levels of other neurotransmitters, such as dopamine and serotonin and endorphins, which are related with stress decreasing and mood enhancement (Dinas et al., 2011; Warburton et al., 2006). Also, steady exercise can recover cardiovascular fitness, which may buffer the body's physiological response to enhance pliability to anxiety-aggravating conditions and stressors (Salmon, 2001).

Cognitive changes: Exercise exerts cognitive profits that may contribute to anxiety regulation by executive working, improving cognitive functioning, such as attentional control, and cognitive flexibility (Basso & Suzuki, 2017; Chang et al., 2012). Contribution in physical activity needs attention and mental engagement, diverting attention away from worries characteristic of anxiety and invasive thoughts (Craft & Perna, 2004). Furthermore, exercise has been revealed to indorse neurogenesis and neuroplasticity in brain sections involved in emotion regulation, such as the hippocampus and prefrontal cortex, which may modulate anxiety-related cognitive processes (Dishman et al., 2006; van Praag, 2009).

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Emotional changes: Consistent engagement in physical activities has been related with enhancements in mood, self-esteem, and self-efficacy, which are key determinants of emotional well-being and resilience to stress. Exercise provides opportunities for mastery experiences and achievement, fostering a sense of accomplishment and empowerment that can counteract feelings of helplessness and anxiety. Additionally, social aspects of exercise, such as group-based activities or team sports, can enhance social support and connectedness, which are protective factors against anxiety and depression (Rebar et al., 2015; Thoits, 2011).

In summary, exercise plays a multifaceted role in anxiety regulation, exerting physiological, cognitive, and emotional effects that contribute to overall well-being. By incorporating regular physical activity into daily routines, individuals may experience reductions in anxiety symptoms and enhanced coping abilities, thereby improving their quality of life and mental health outcomes.

The Impact of Exercise on Anxiety

Exercise has emerged as a promising intervention for reducing anxiety symptoms and promoting mental well-being. Research investigating the effects of exercise on anxiety levels has yielded valuable insights into the mechanisms through which physical activity influences psychological outcomes. This section provides an overview of the impact of exercise on anxiety, drawing upon empirical evidence from experimental and observational studies.

Acute Effects of Exercise: Acute bouts of exercise have been shown to produce immediate reductions in state anxiety, leading to improvements in mood and affection. Meta-analytic reviews have consistently demonstrated moderate to large effect sizes for the anxiolytic effects of acute exercise, with improvements observed across various populations and exercise modalities (Herring et al., 2010; Stonerock et al., 2015). The transient reduction in anxiety following exercise is thought to be mediated by changes in neurotransmitter activity, including increased release of endorphins and other neuropeptides, as well as alterations in brain-derived neurotrophic factor (BDNF) levels (Dinas et al., 2011; Strickland et al., 2002).

Chronic Effects of Exercise: Long-term commitment in regular exercise has been linked to sustained declines in anxiety sensitivity and trait anxiety, leading to improved resilience to stressors and reduced vulnerability to anxiety illnesses (Rebar et al., 2015; Stubbs et al., 2017). Prospective cohort studies have documented dose-response relations between anxiety and physical activity levels outcomes, with greater intensities and volumes of exercise discussing larger protective effects against anxiety symptoms (Stonerock et al., 2015;

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Teychenne et al., 2008). The chronic anxiolytic effects of exercise are thought to be mediated by neuroplastic changes in the brain, including increased hippocampal neurogenesis, upregulation of serotonin receptors, and normalization of hypothalamic-pituitary-adrenal (HPA) axis activity (Dishman et al., 2006; van Praag, 2009).

CONCLUSION

In summary, resistance exercise deals with both chronic and acute anxiolytic effects, creating a valued intervention for decreasing anxiety signs and improving psychological well-being. Considerate the mechanisms underlying the relationship between anxiety and resistance exercise, in addition to the ideal parameters for anxiety lessening, is important for capitalize the therapeutic possible of resistance exercise in non-clinical and clinical populations.

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