



# THE ROLE OF EXERCISE IN ANXIETY AND DEPRESSION: BACKGROUND AND PRACTICAL CONSIDERATIONS

GARY STEBBING, PGDIP, CSCS

## INTRODUCTION

From a clinical medical perspective, physical activity and exercise are now a cornerstone of disease prevention and also part of the treatment repertoire in many chronic diseases (16). The health promoting aspects of exercise have often been seen primarily from a physiological perspective; however, accumulating evidence suggests that physical activity is also associated with psychological health (14,19). More specifically, it has been proposed that physical activity and exercise might have an important role to play in managing mild-to-moderate mental health conditions, particularly depression and anxiety (15). In addition, physical “inactivity” has also been associated with increased risk of developing anxiety or depression (20).

## DEPRESSION

Depression is recognized as a worldwide public health burden; 2015 statistics from the World Health Organization (WHO) estimate 300 million people suffer from depression worldwide, with depression ranked the number one contributor to global disability (22). Treatment protocols for depression primarily focus on pharmacological interventions and/or psychological therapies; however, based on prevalence figures, and the associated costs of mental health disorders, exercise can now be considered as a viable allied or alternative therapeutic strategy within the mental health treatment process (16).

If left untreated, depression tends to become chronic and may lead to increasing disability. Additionally, evidence suggests it is often co-morbid with other major chronic diseases and that this might have a negative effect on overall health outcomes (13). Despite this evidence, depression in this group can often go unnoticed and untreated. Therefore, professionals should be mindful of the increased risk of depression and anxiety when working with people who have chronic disease (13).

## ANXIETY

Anxiety and related disorders also present a major health challenge, with the WHO estimating that there are 264 million sufferers worldwide (22). Anxiety disorders include phobias, panic disorder, generalized anxiety disorder, obsessive compulsive

disorder, and post-traumatic stress disorder (16). Additionally, anxiety may also be a symptom in other physical and mental conditions (16). Anxiety disorders can present with a complex range of behavioral, cognitive, and physical symptoms, and common treatment approaches involve medications and psychological therapeutic approaches (8).

An early review of literature by Plante and Rodin supported the role of exercise in improving mood and well-being; reducing anxiety, depression, and stress; and improving self-concept, self-esteem, and self-assurance (17). Further evidence has supported physical activity in treating mild-to-moderate depression, anxiety, and panic disorder (2,15). A meta-analysis of reviews in older populations reported improvements in self-efficacy and anxiety with increased physical activity (14). Evidence also suggests improvement in perceived function and social benefits in older people, and possible benefits in anxiety and depression in younger populations (6,9). A recent systematic review also suggests that physical activity can have a positive overall effect on depression (3).

Despite this growing body of evidence for a positive relationship between physical activity and mental health outcomes, much still remains to be clarified. In particular, two articles have highlighted significant methodological problems, and one of the biggest challenges in considering the evidence base for the effect of exercise is the experimental method employed (18,19). This has varied widely (e.g., exercise versus placebo, exercise versus medication, exercise versus no other intervention, and exercise versus psychological therapies). Recently the effect of research publication bias, where experimental outcomes may affect publishing decisions, has also been questioned (18). The general understanding of the specific role of exercise and how to research its effects are therefore still being developed.

In an attempt to understand the effects of exercise, an array of physiological, psychological, and biochemical mechanisms have been proposed. These include the impact of endorphins, increases in mitochondria, activation and signaling of mammalian target of rapamycin, and effects on neurotransmitters and the

hypothalamic-pituitary-adrenal axis (11). A relationship between inflammatory responses and depression has been explored, suggesting the anti-inflammatory effects of exercise may also have a positive effect on mood state (4). There is evidence of increases in brain-derived neurotrophic factor during physical activity and related possible links to growth of the hippocampus in the brain, as well as adaptations in other regions of the brain (12,16). Psychological mechanisms related to self-esteem and self-efficacy theory, the distraction hypothesis, mastery hypothesis, and social interaction hypothesis have also been postulated (11,15). Furthermore, Western culture positions exercise as a positive health behavior, so introducing or increasing activity levels is likely to generate positive feedback socially and environmentally (16). Overall, there is general agreement that it is highly likely that exercise-related improvements are a complex interaction of both psychological and neurobiological mechanisms acting in very dynamic ways (19). Understanding the dose-response relationship and the neurobiological mechanisms behind observed benefits are the likely objectives of future research.

Another recent insight supports the importance of non-exercise physical activity (NEPA) in health and wellness of older adults (5). High reported levels of NEPA were linked to improved health status across a range of markers, including waist circumference, high-density lipoprotein cholesterol, and triglycerides (5). The researchers concluded that “a generally active daily life was, regardless of exercising regularly or not, associated with cardiovascular health and longevity in older adults,” (5). Increasing NEPA may therefore have a possible benefit to other groups, including depression and anxiety as an adjunct to structured exercise.

A range of psychotherapeutic and pharmacological methods are available for the treatment of various mental health conditions. With its developing evidence base, and the wider healthcare issues related to cost, exercise is now being considered within the mental health treatment package. However, promotion of physical activity and exercise is a major challenge with the current environment and lifestyle patterns reducing activity at every turn (10). Optimization of any exercise intervention is likely to need a multi-disciplinary approach involving both scientists and practitioners in psychology, sports medicine, and healthcare (19). Supervised exercise interventions have been associated with the greatest improvements; therefore, personal trainers have a key role to play alongside clinical psychologists and psychiatrists in promoting physical activity and delivering exercise to support the management of these mental health disorders (18).

### CONSIDERATIONS IN PROGRAM DESIGN FOR DEPRESSION AND ANXIETY

Naturally with the array of possible benefits that exercise might present, interest has moved to the most effective program design for achieving maximum impact (20). A specific exercise prescription identifying key programming variables (e.g., frequency, intensity, type, duration, exercise selection) has so far proved to be elusive. To date, most researchers have used cardiovascular conditioning via aerobic activity, such as walking, as the exercise approach (11,16). The possible superiority of a resistance training or concurrent type approach to exercise sessions has also been highlighted (3). The importance of factors

such as environment (exercising indoors versus outdoors), social contact (group versus solo exercise), and supervised versus unsupervised activity require further assessment (16).

Below are a list of some important considerations for personal trainers in program design for clients with depression and anxiety:

- Applying the principle of individualization is essential in exercise programming, management of recovery, and overall training tolerance for this group. Exercise must be designed in consideration of both condition and client.
- Training must carefully consider the responses to exercise of the individual in relation to interactions with pharmacological regimes in place.
- Building from low-intensity primarily aerobic activity of relative short duration is probably prudent in most cases.
- Gradual increases in intensity and duration as tolerated and the careful introduction of supervised resistance training to establish a concurrent programming approach over time.
- The possible benefits of higher-intensity training are yet to be established but remain an option based on client capability and tolerance.
- Increasing daily levels of non-exercise physical activity may also be encouraged as an adjunct to an exercise program.

### FURTHER CONSIDERATIONS IN THE ROLE OF THE PERSONAL TRAINER

- The personal trainer can assist in understanding and applying research into psychophysiological processes to maximize practice and fitness programs. It is important that personal trainers are aware of current and developing evidence in the psychobiology of exercise, as well as how it impacts their programming choices. For example, the effect of exercise on stress hormones; the relationship between exercise, stress, and immunity; and the effect of exercise on sleep patterns.
- Although personal trainers should be aware of the physiological responses to exercise, they may not be aware of how this stress response may differ in certain populations. For example, a patient with generalized anxiety disorder might find the exercise situation or environment more threatening, and thus, their physiological responses might be very different.
- As the literature in the field develops, personal trainers will need to understand and be updated on the key modalities, intensity levels, and frequencies that appear to be most effective for mental health disorders. It is the role of the personal trainer to stay current and provide updates of this nature to the client.
- Personal trainers must focus on enhancing their interpersonal and communication skills so they can be more effective with the various mental health disorder populations. It is likely that many personal trainers will lack specific knowledge of symptoms, presentations, and treatment approaches for many mental health disorders. For example, a patient may be undergoing cognitive behavioral therapy; the actions and behaviors of the personal trainer need to be aligned to support this type of therapeutic

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input. The interpersonal skills that might be effective with apparently healthy populations will therefore need to be developed.

- The personal trainer might also work with health promotion staffs and clinical teams to increase exercise motivation and adherence in mental health patients. Adherence is a problem in exercise interventions; understanding best practice in client management can enable the personal trainer to select strategies to assist the patient in adhering to the exercise program (2). This might involve helping individuals set appropriate goals and objectives for themselves and also dealing with resistance and ambivalence to the process of changing exercise behavior.
- Motivational interviewing is an approach proposed for use in changing health behavior, which has potential within exercise settings (7). An example of this would be helping personal trainers understand the principles of motivational interviewing, then supporting clients as they apply the principles, and finally, helping them explore solutions to the challenges that brings.
- The personal trainer can be a resource in facilitating an optimal “motivational climate” for the clients. This might include simple ideas on manipulating the environment or creating reinforcement approaches, such as developing optimal feedback and reward strategies for participants, initiating pre-exercise goal reviews, and the use of techniques such as the decisional balance sheet to help those struggling with change (21).
- Lastly, the personal trainer can help with optimizing the psychosocial benefits patients can gain from their exercise. The benefits of physical exercise do not just lie in improved fitness; the role of a patient’s subjective experience and its relation to health outcomes is not always reducible to the laws of physiology, and is not just a mechanical process (1). The personal trainer can work with patients on attitudes toward exercise, help them to feel more empowered, build self-efficacy, and provide support and encouragement. This involves a greater emphasis on a coaching approach, where the patient has an active role in their success rather than being “treated” with exercise, as can sometimes be the approach of a traditional exercise intervention.

## CONCLUSION

Despite methodological challenges in research design, evidence suggests a positive relationship between physical activity, exercise, and mental health. Exercise as a treatment modality is now being considered alongside psychotherapeutic and pharmacological approaches, and the role of specifically trained exercise specialists and personal trainers is an important component of the multi-disciplinary team. Precise exercise prescription remains challenging, and an emphasis should be placed on individualization in the program design and implementation. Skills grounded in exercise psychology and wellness coaching can play an important role in successful exercise interventions.

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### ABOUT THE AUTHOR

*Gary Stebbing is a specialist in physical training and mental skills preparation. He studied sport and exercise science at the undergraduate level and sport and performance psychology at the postgraduate level. He has been a Certified Strength and Conditioning Specialist® (CSCS®) since 2002. He has published and lectured in fitness training and coaching in the United Kingdom, United States of America, and Australia, and is a visiting lecturer on the postgraduate physiotherapy program at University College London.*

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