Exercise-related Mental Health Problems and Solutions during the COVID-19 Pandemic

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Introduction

Most people will find it challenging to maintain their mental health during the COVID-19 pandemic. People with a history of mental illness, including anxiety disorders, mood disorders, posttraumatic stress disorder (PTSD), and related disorders are now forced to navigate the fear and trauma of living through a pandemic, often in isolation. Even individuals with no history of anxiety, depression, or PTSD may experience a level of stress during the pandemic that makes it difficult to maintain their mental health. Exercise is a control mechanism for many living with mental illness and a protective factor in the lives of those without mental illness. Mental health and physical health are closely intertwined when it comes to exercise. However, exercise routines are heavily disrupted by this pandemic. Our focus is to highlight how the disruption in individual exercise programs requires distinctive solutions to protect and enhance mental health during the COVID-19 pandemic using a case-based approach.

Fictional Case Summaries

Exercise for mood enhancement: Ms. O is a 45-year-old woman with a history of anxiety and depression. Her last major depressive episode was in her mid-30s that improved with a combination of selective serotonin reuptake inhibitor medication and psychotherapy. She has maintained a stable mood and controlled her anxiety for several years with lifestyle improvements, including healthy eating and a regular routine of home-based cardiovascular exercise and supervised resistance training. She is concerned that the disruption of her new lifestyle routines during the pandemic will overwhelm her with anxiety.

Exercise for physical health: Mr. B is a 61-year-old man with a history of hypertension and hyperlipidemia, and a family history of Alzheimer's disease. His blood pressure is well controlled with chlorthalidone and a Dietary Approaches to Stop Hypertension (DASH) diet. He recently started an individualized, instructed exercise program he got from a personal trainer at the local gym. His primary motivation for starting his exercise program was to preserve his cognitive function, based on a family history of Alzheimer's disease.

Training for competition: Ms. S is a healthy 21-year-old elite female collegiate track and cross-country runner. The National Collegiate Athletic Association canceled spring sports, leaving her with no track season and only hope that cross-country competition will be allowed in the fall. She is worried that she will not have enough time to adequately train for the season as all the area athletic facilities are closed at least 2 months. She knows her strength training routine gives her a competitive edge that she will lose if she cannot follow her facility-based off-season strengthening program.

Exercise for social connection: Mr. H is a 32-year-old man with a history of PTSD. He is a construction worker and witnessed the death of a coworker and personal friend while on duty. He and his work friends connect while working out at the same gym. This social connection has helped him cope with his friend's death. He is worried about losing the connection to his friends outside of work with the gym and other social hangout spots closed due to social distancing orders.

Discussion

Exercise as mood enhancement: Ms. O illustrates a common benefit of exercise for people with and without mental illness. The effect of exercise on mood has been studied from several perspectives: active compared with sedentary, exercise compared with antidepressants, and exercise combined with antidepressants compared with antidepressants alone. In a 16-wk study published in 2007, participants were randomized to one of four cohorts: supervised exercise program, home-based exercise program, medication (sertraline), or placebo. All groups showed similar rates of remission of 45% for supervised exercise and 47% for medication. However, these improvements were not statistically significant compared with the placebo group (1). Exercise may improve depression symptoms with similar efficacy to an antidepressant medication, but this effect is likely mild.

Exercise has significant effects on certain aspects of anxiety. A 2015 study on anxiety state after aerobic and resistance training showed significant decrease in anxiety sensitivity — overreacting

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1537-890X/1906/194–195
Current Sports Medicine Reports

to sensations that accompany anxiety — with both forms of training. Other markers of anxiety, such as severity of anxiety after a 35% CO_2 breathing challenge test and intolerance of uncertainty, were either reduced only by aerobic exercise or not reduced by either form of exercise (2). These two studies support that people like Ms. O could be adversely affected by the altered exercise conditions of the pandemic. Exercising at home would likely have a similar effect on her depression control as her supervised exercise plan; however, she would lose the social aspects of her supervised program. If she were to add resistance training to her home program, she also may improve the control of her anxiety. Increasing the volume of her aerobic exercise or devoting the additional time to other mood-enhancing activities would likely achieve a similar effect.

Exercise for physical health: Mr. B demonstrates the many benefits of exercise that contribute directly to stable mental health. A 2016 narrative review on the relationship between physical activity and mental health partially attributes improved self-esteem to better physical fitness (3). The author of the same review also references a study that measured cognitive function in adults who exercise using tasks involving complex executive functioning and demonstrated a 45% reduction in relative risk for Alzheimer's disease (4). While physical activity directly improved Ms. O's mood, her improved physical fitness also may have enhanced her mental health through the indirect effect on her self-esteem.

Mr. B could potentially benefit from other activities that enhance his self-esteem while he is unable to visit his local gym. A systematic review of the psychosocial benefits of cooking interventions found two studies that demonstrate significant improvement in self-confidence and self-esteem after participating in cooking classes. Notably, the cooking classes in the two studies were completed under different circumstances. The first was for a mental health inpatient program and the second was for reducing obesity rates (5). Mr. B could focus on other aspects of his physical health, such as healthy eating and cooking activities, which could maintain high self-esteem and preserve his motivation for physical and mental fitness.

Exercise for training in an elite athlete like Ms. S shows that mental health in competitive athletes can vary based on access to both training and competition and by the competitive level of an athlete. Mental health in athletes also can vary in individual compared with team sports. In a study of child and adolescent athletes, individual sport athletes reported anxiety and depression at a rate of 13%, while team sport athletes reported a significantly lower rate of 7%. Additionally, individual sport athletes were more goal-oriented compared with team sport athletes (30% vs 21%) where a greater percentage played "for fun." This result cannot be extrapolated to adult athletes (6). However, it touches on the mental health dynamics of individual versus team sports and suggests that competitive individual sport athletes like Ms. S may not experience the same mental health benefits of exercise as noncompetitive athletes or competitive team sport athletes.

Ms. S also demonstrates lack of control as a source of anxiety. This is consistent with the biologically motivated necessity for perception of control. This drive to modify behavior to feel in control is mediated through connections between neurons in the brain called the corticostriatal network (7). In this time of perceived lack of control, a strategy for anxiety mitigation in elite competitive athletes is the same solution as everyone else, find a way to take back control. Instead of focusing on the disappointment of the inability to train with weights, Ms. S could maintain her strength with incline runs or exercises against alternative forms of resistance. Similarly, she could set new goals and use this time to focus on overall improvement in athletic performance, including injury reduction and optimizing nutrition and sleep.

While Mr. H's use of exercise for social connection is fairly specific, his solution is widely applicable. The use of exercise as a source of social connection is heavily impacted by the pandemic because of physical distancing and closure of social gathering spots, including fitness centers and gyms. As stated in a 2005 literature review, "the social relationships commonly inherent in physical activity, as well as the mutual support that occurs among individuals involved in exercise, play an important role in the effects of exercise on mental health" (8). It will be essential to maintain social relationships during this pandemic by finding new ways to communicate with friends. Connecting can include virtual activities or in-person activities following physical distancing guidelines. For example, Mr. H and his friends could do a virtual push-up challenge or jog together while maintaining physical distance.

Conclusions

Before individuals effectively change their behavior around the exercise-related benefits of mental health, they must recognize the scope of this pandemic. The acute danger of COVID-19 is greater than the potential risk of losing some benefits of exercise for a short period. Additionally, a short-term disruption in normal exercise routines is unlikely to have catastrophic effects on mood, long-term physical health, athletic goals, and social relationships. However, it is important to recognize the potential exercise-related solutions to these specific problems if the disruption in exercise routines becomes a burden on mental health.

The authors declare no conflict of interest and do not have any financial disclosures.

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