

A New Twist on Mental Health: Treating Depression with a Prescription to Exercise

By Deborah O. Norris, Ph.D.

Exercise may be more effective than prescription drugs in treating and controlling depression. While most health scientists agree that exercise has a positive effect on physical well-being, a new body of research is beginning to show that exercise is similarly beneficial for mental well-being. Research shows that properly prescribed exercise can positively enhance self image, elevate mood, improve the ability to cope with stress, increase energy and increase one's feelings of well-being overall. Prescribing exercise as a therapy for treating depression is a growing area of research interest and potential.

Over 19 million people in the United States are reportedly diagnosed with depression. Many others suffer without diagnosis. The signs and symptoms of depression include loss of energy, motivation, hope and zest for life and an overall feeling of worthlessness. Prescription medication and psychotherapy are the most common forms of treatment for depression within the US. Annually, over \$53 billion is spent in treating depression with prescription medications such as tricyclics, monoamine oxidase inhibitors or serotonin reuptake inhibitors (SSRI). Effects are usually not seen before six weeks of drug therapy and may be dependent upon continuing medication. Psychotherapy is another viable, yet costly, treatment option for dealing with the debilitating effects of depression, usually administered in one of several forms including psychodynamic or cognitive-behavioral, individual or group. Psychotherapy can also be a lengthy and time-consuming process.

Reports on the effectiveness of exercise therapy on psychological well-being are extensive and show promising results, requiring considerably less cost and time commitment than either drug or psychotherapy. An analysis of 64 studies evaluating the effects of exercise on mental health showed that exercise relieved depression, improved self-esteem and enhanced work behavior. Similarly, studies comparing psychotherapy with exercise therapy find, in general, that regular exercise is as effective as psychotherapy in treating depression. Dr. J. Greist and colleagues compared three treatment groups of people with moderate depression. The interventions included time-limited psychotherapy, long-term psychotherapy and jogging three times a week for 45 to 60 minutes with a trainer. After 12 weeks, Dr. Greist found that 75% of the people in each group had symptom relief. After a year of exercising, however, those patients who continued to jog had continued relief, whereas those in psychotherapy alone had relapsed and returned to treatment.

Physiology of Exercise

Exercise is related psychologically to a positive decision to enhance one's health and to an increased sense of mastery. Physiologically, it is related to neurochemical changes, which are associated with relief from depressive symptoms. Endurance exercises, such as running, walking or cycling, cause the release of endogenous opioid peptides called endorphins and their precursors, the lipotropins. Endorphins and lipotropins are linked with the body's energy balance and lipolysis, which are in turn related to feelings of positive mood and enhanced immune function. Research has also established that running affects the balance of biogenic amine neurotransmitters in the brain, such as serotonin. Exercise affects serotonin levels in two ways. Lipolysis-elicited release of free fatty acids in the blood increases the concentration of circulating tryptophan, a precursor of serotonin. Therefore, more tryptophan enters into the brain. Exercise also promotes enzymatic feedback mechanisms that allow tryptophan to be converted to serotonin, where its actions in the brain elevate mood in the same way as SSRI medications, but without the adverse side effects. Pre-treatment with supplemental tryptophan can further amplify exercise-induced serotonin release by up to 100%.

In the 1990s, the Surgeon General's report on physical activity and health catalyzed a new wave of research on the mental health benefits of exercise. A review of this research shows that lifestyle changes involving exercise and diet are effective for managing symptoms associated with depression. For example, Dr. Andrew Weil recommends 30 minutes of aerobic exercise at least five times per week for calming the nervous system. Dr. Weil also recommends the use of supplements such as dl-phenylalanine, 500mg vitamin C and 100mg vitamin B6 for treating depression. Most studies find that intense activity that keeps the heart rate elevated for at least 30 minutes per day, at least three to five days per week, are effective in treating depression. Some evidence also shows that strength training can play a role in treating clinical depression.

Exercise Versus Prescription Drugs

The first large scale studies to empirically examine the relative benefits of exercise and prescription drug therapy in treating depression were conducted by James Blumenthal and colleagues at Duke University Medical Center. This experiment evaluated 156 patients diagnosed with major depressive disorder. Depression was assessed by clinical interview using the Diagnostic Interview Schedule and the Hamilton Rating Scale for Depression as well as through self report using the Beck Depression Inventory. Patients were assigned to one of three treatment groups for a period of four months; one group was given the SSRI anti-depressant medication Sertraline, one group was prescribed exercise and a third group was prescribed both exercise and Sertraline. The exercise prescription consisted of maintaining 70% to 80% of the maximum heart rate. Patients were prescribed 30 minutes of exercise per day, plus a 10-minute warmup and five-minute cool down, three times a week.

After four months of treatment, patients in all three groups exhibited significant improvement. However, six months after therapy was concluded, subjects who had been assigned to the exercise group had significantly lower relapse rates ($p = .01$) than subjects in the medication group. Ninety-two percent of the patients who had been treated with exercise alone were free of clinical signs of depression, whereas of those who had received medication alone, only 62% were still symptom-free. Interestingly, of the individuals who received both a prescription for exercise and medication, only 69% were free of symptoms of depression at the 10-month follow up. These results indicate that among individuals with Major Depressive Disorder, exercise therapy is feasible and is associated with significant therapeutic benefit, especially in cases where exercise is continued over time. Furthermore, these results show that treatment with medication can interfere with the long-term potential benefits of exercise therapy in the treatment of depression.

Standard of Care

There are many potential benefits to implementing exercise therapy as part of the protocol in the standard of care for treating depression. Properly prescribed exercise has proven to be four to five times more cost effective than traditional treatments for depression. Large-scale experiments using valid, randomized subject design have now shown that exercise is a more effective method of treating major depression than medication and is also effective in conjunction with psychotherapy. Furthermore, properly prescribed exercise is not associated with the adverse side effects sometimes reported for prescription medication, such as headaches, lethargy, sexual dysfunction, seizure and panic attacks. In addition, treating depression with exercise may prove effective in warding against other potential associated illnesses.

Exercise is frequently noted as an effective treatment for physical complications such as heart disease, stroke, obesity, diabetes, hypertension, cancer, osteoporosis and other debilitating medical conditions, which are also associated with depression. Finally, exercise can also reinforce other positive life changes, such as eating habits, weight control, smoking cessation and creative thinking. As the mental health field becomes familiar with these benefits of exercise, exercise prescription may become part of the standard of care in treating depression.

Treating Depression in the Elderly

A recent report by the National Institute of Mental Health assessing mental health in the elderly noted that depression is extremely widespread and has become a serious public health concern. Surveys show that more than 15% of the elderly population experiences depression at some point, while an additional 25% of elderly individuals have periods of persistent sadness that last two weeks or longer. Overall, the elderly are more apt to experience depression because they tend to experience more loss and no longer get as many benefits from feelings of self esteem that coincide with working and being more active. It can be difficult to treat the elderly for depression with medication and counseling, because many deny that they need such treatment. However, promoting lifestyle changes such as exercise has also proven to be effective in treating the elderly. Furthermore, these studies show that older patients can be motivated to participate in exercise programs, and can reap the therapeutic benefits of their participation. Therefore, whenever possible, it is important to consider exercise as part of the therapeutic protocol, even in treating the elderly.

Future Research

There are many areas for further research in the field of clinical exercise prescription for the treatment of depression. Further research should explore the motivational factors that can lead to participation in an exercise program and ultimately lead to the benefits gained from continually exercising. Researchers from Duke University plan to continue their research in order to grasp the more subtle factors that may explain the positive effects of exercise with regards to one's psyche and overall well-being. Over the next five years, they plan to enroll 216 volunteers, half of whom would randomly be assigned to take Sertraline, and the other half assigned to exercise. This study will test, like it did previously, the results of exercising versus taking medication with regards to the rate of relapse of depressive symptoms. However, unlike the previous study, this time exercise patients will be further split into two groups. Half will do their exercising at home, while half will exercise in a group at the Duke Center for Living. Researchers hope to discover if supportive atmospheres/ social contact during exercise also help to reduce the rate of relapse.

There is also a gap in the research that explicitly defines the mechanisms by which exercise is able to raise serotonin levels without the adverse side effects associated with serotonin stimulating medications, and the mechanism by which these medications adversely affect obtaining the benefits from exercise. Future research should continue to evaluate the physiology of the exercise response that is associated with improvement from depressive measures and should continue to evaluate the many variables associated with exercise, which may affect recovery.

Though exercise has proven, through rigorous controlled clinical trials, to be a valid therapeutic approach for the treatment of depression, it is still not indicated as a standard treatment protocol for mental health professionals. The empirically valid research, which is now available on the therapeutic value of exercise in treating depression will hopefully allow more medical professionals to prescribe exercise therapy for depressed individuals of all ages. Clinical exercise prescription is best provided by clinical exercise specialists who have been trained in working with special needs populations and in the physiology and prescription of exercise. Hopefully, with continued research and interest in the therapeutic benefits of exercise, we will see growth in the practice of clinical exercise prescription and we will see better success in the treatment of depression.

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