Shaping Up Your Mind

Researchers are putting physical training through its paces as a potential technique to ease stress responses and symptoms of mild depression

By BRUCE BOWER

Regular exercise can do wonders for the body, but does it firm up the mind as well? Is a physically fit person, for instance, better able to deal with stress at work and at home? Will a program of supervised running and calisthenics help to ease the mild depression that might send some people to a psychotherapist?

On the heels of the recent "fitness boom," some physicians and psychologists have proposed that the answer to these questions is a resounding "yes," but researchers are just beginning to understand the effects of exercise on mental life.

"A lot of claims for the psychological benefits of exercise have to be tempered," says psychologist David Sinyor of Concordia University in Montreal. "This area is ready for some serious research."

Despite the conflicting results of a number of studies thus far, there is evidence that physically fit individuals have an advantage in dealing with stressful real-life events. An example is a report by University of Kansas at Lawrence psychologists David L. Roth and David S. Holmes in the March/April 1985 PSYCHOSOMATIC MEDICINE. They found that when confronted with a high proportion of life changes such as divorce, death of a loved one and switching jobs in the previous year, physically fit subjects reported fewer health problems and symptoms of depression than less fit counterparts. However, in another study of "high life-stress subjects," Roth and Holmes observed that once stressful changes have already occurred, supervised fitness training is not particularly effective at reducing physical illness. The strength of fitness, says Holmes, lies in its ability to prevent, not treat, symptoms occurring after major life changes.

Yet the findings are far from conclusive, cautions Sinyor. Several experiments have found that heart rates of physically fit persons — in most cases, runners — do not differ from those of nonexercisers during stressful laboratory tasks, although the exercisers return to their resting heart rates more quickly after completing a task. A few other studies, however, have found that exercisers' heart rates respond more slowly while they perform similar laboratory tasks.

In addition, Sinyor says, people who gravitate toward physical training may do so because of personality characteristics that already protect against stress, a factor unaccounted for in prior studies. Also, learning any skill, from rug weaving to relaxation techniques, may increase self-confidence and coping abilities in the same way as a physical conditioning regimen.

With these caveats in mind, Sinyor and his co-workers randomly assigned 38 healthy males in their 20s to either aerobic (calisthenics and jogging), weight-lifting or no-exercise groups. Both exercise groups met three to four times per week over 10 weeks in one-hour sessions. Before and after the course of training, the researchers measured each subject's aerobic fitness (oxygen uptake while walking on a treadmill), administered tests on anxiety, depression, self-esteem and daily hassles, and measured heart rate and self reports of arousal in response to stressful laboratory tasks.

"Potent" laboratory stressors were used, says Sinyor. These included a task in which the word "red," for instance, was flashed on a screen but appeared in green letters. The subject had to report the color in which the word was printed while a conflicting color name was presented through headphones. A new color-word appeared every second.

Upon completion of aerobic and weight-training courses, no improvement in heart rate or self-reported arousal to laboratory stress was found for the exercise groups or their armchair counterparts, report the researchers in the May/June PSYCHOSOMATIC MEDICINE. Aerobic trainers, though, did return faster to their resting heart rates once a stressful task was over.

A longer training program may be needed to dampen stress responses, says Sinyor. In addition, psychological shifts associated with fitness improvement may lag behind physiological changes. But for now, he contends, it is not known if, or at what point, physical conditioning creates a psychological buffer against stress.

Holmes, however, says the Canadian researchers may have found no fitness effects because the tasks they assigned were too stressful. If all subjects reached a maximum or "ceiling" level of arousal in the laboratory, training-related differences would not have shown up.

In a study set to appear in PSYCHOSOMATIC MEDICINE later this year, Holmes and colleague Beth M. McGilley find substantially lower heart rate responses to a less "potent" stressor among relatively out-of-shape subjects participating in a 13-week aerobic training program compared to no-exercise controls. The laboratory task involved reading six series of five numbers and, after looking at each series, repeating it backwards from memory. Subjective reports of stress during this assignment remained the same, however, for training and no-exercise groups.

In a further experiment, Holmes assigned 49 college students reporting high levels of stressful life events in the previous year to aerobic training, relaxation training or no training. After 11 weeks, the aerobic training group showed a markedly lower heart rate response during the same memory test than the other two groups. Curiously, subjects rated relaxation training as having a more calming influence on their lives than exercise. This indicates, says Holmes, that heartfelt testimonials to a particular type of training do not necessarily translate into beneficial physiological responses to stress.

"It appears that fitness may be a valuable prophylactic for dealing with stress," holds Holmes.

There are also a few reports, he notes, that aerobic training elevates the mood of people with mild cases of depression. But controlled, long-term studies of depressed individuals prescribed exercise programs have not yet been carried out. For that matter, long-term studies of heart rate and subjective responses to stress among exercisers and controls have not been conducted either.

Another limitation to research on stress and mood reactions to exercise is that most of it has been performed in the laboratory, not the field. "There are no good data on how well lab stress generalizes to the outside world," says Holmes. So far, he adds, physiological measures other than heart rate, such as blood pressure, have not been affected by brief aerobic training.

"We're seeing the first wave of serious work in this area," says Holmes, who has been granted a year's leave from the University of Kansas to obtain training as an exercise physiologist. "Psychologists studying exercise and stress," he says, "often treat people as black boxes" — where a treatment goes in and appropriate responses either do or do not come out — "but it's important to know what's being changed inside the box." □