Empirical evidence has shown a positive relationship between physical training and selected mental health variables. In nonclinical studies the most significant effects of physical exercise have been on self-concept and body image. Two affective variables, depression and anxiety, also seem to be influenced by physical activity but to a lesser degree in this population than with clinical populations. Certain clinical populations appear to benefit cognitively and socially from exercise even though the activity may not be aerobically stressful. Theories that attempt to explain the relationship between fitness and mental health are discussed.

Much has been written on the subject of psychosomatic illness as it refers to the impact of the mind on physiological or somatic functions. Allergies, hypertension, ulcers, asthma, digestive problems, and even some forms of cancer have been shown to be strongly influenced by an individual’s mental state. A variety of treatment regimes for psychological disorders now reflect this point of view. Biofeedback, relaxation, and guided imagery, for example, are designed to restore the mental balance needed to diminish physical disorders that seem to be closely associated with mental dissonance.

Although much of the literature has stressed the influence of the psyche over the soma, there has been a growing interest to consider an alternative view of the relationship of these bodily changes to mental attitude. In effect this transposition suggests that physical activity, which stresses somatic functions, produces a sense of psychological well-being and a positive psychological response. Recently Americans have shown a renewed interest in physical fitness and health. There is a growing desire to prevent illness and disease by emphasizing life styles that promote wellness. Individuals have become more conscious of nutrition, stress management, substance abuse, leisure activities, and physical fitness (Ardell, 1977; Bloomfield & Kory, 1978; Whitmer, 1982). This trend has had a positive effect on stimulating research in fitness and health related areas. Instead of focusing on the mind as the preeminent and dominant force in the human organism, theorists have begun to suggest that the body may hold an equally significant relationship over the mind.

A particular focus of this review is the effect physical fitness may have on the psychological health of the individual. The media has frequently reported that extremely
beneficial psychological outcomes can be linked with physical activity. If these reports are true, they have significant implications for helping professionals who are involved in habilitation and rehabilitation of clients who suffer from physiological and/or psychological disturbances. Many more activity therapy programs, for example, would need to place an increased emphasis on acute physical activities and exercise as a therapeutic modality.

Theoretical Frameworks

In attempting to explain how the body affects the mind, researchers have postulated several different theories. Some claim physical exercise provides a distraction or diversion from anxiety provoking cognitions (Morgan, 1979a; Selye, 1976). Others speculate that exercise is a form of meditation which precipitates an altered state of consciousness (Buffone, 1980; Solomon & Bumpus, 1978). Stein and Belluzzi (1978) suggest that vigorous physical activity causes the brain and pituitary gland to synthesize morphine-like chemicals, resulting in a sense of euphoric well-being. A few runners actually have experienced a “negative addiction” (Morgan, 1979b) which causes them to be dependent on the psychological “high” they receive from extended periods of jogging. As is frequently the case with substance abusers, these individuals find they need to increase their exercise in order to maintain their feelings of elation. Thus, there appears to be some biochemical change triggered by vigorous physical activity, but it has not yet been isolated.

Ismail and Trachtman (1973) utilize the locus of control theory, stating that physical training gives people a sense of mastery or control over themselves and their environment. Gaining control becomes associated with a sense of well-being, which enhances the self-concept, reduces anxiety, and has a positive effect on other personality variables.

More recently, Schwartz, Davidson, and Goleman (1978) speculated that accepted principles of psychobiological specificity might explain their results on anxiety. They suggest that separate systems of the brain and nervous system carry cognitive and somatic anxiety, and each of these respective systems has a finite amount of channel space. If unwanted information dominates the space, anxiety will inevitably result. They suggest further that if information of a neutral nature is introduced, it has a cleansing effect on the system since it competes with the existing unwanted information for channel space, resulting in the attenuation of existing behavior associated with anxiety. For example, if a neutral experience such as vigorous physical activity were introduced into the system carrying somatic anxiety, it could produce a cleansing effect resulting in less anxious behavior. Thus, Schwartz and his colleagues propose that instead of psychological stimuli producing general arousal of the organism, the process is one in which specific underlying systems are involved.

However, all of the above explanations have been criticized by Folkins and Sime (1981) as being simplistic and mechanistic. They endorse what they claim is a more theoretically valid framework proposed by Lazarus (1975) for understanding the cause and effect relationship between fitness and psychological health. Fitness training enhances the person’s ability to adapt to and cope with the environment, according to Lazarus. Coping behavior precedes emotion and helps regulate its form and intensity. Physical fitness training therefore can be considered one of many self-regulating procedures used to reduce psychic and somatic conflict. Increases in physical fitness reduce excitation to emotion-provoking
stimuli by slowing autonomic responses (e.g., heart rate, blood pressure), thus decreasing somatic turmoil. This position is supported by Zillmann, Johnson, and Day (1974) in their study of the attribution of arousal and the proficiency of recovery of physically fit and unfit male subjects. Physically fit subjects were less provoked to aggression than were unfit subjects, which seems to indicate that persons of superior fitness are more able to cope with stimuli that have the potential of provoking aggression. Michael (1957) also suggests that exercise provides the means of strengthening the adaptive mechanism of the body. Lazarus’ approach appears to be more comprehensive and thus more useful to us as we begin to assess how physical activity affects psychological behaviors and feelings.

**Definition of Parameters**

Since the focus of this review is on physical fitness and mental health, it is necessary to define these rather broad terms so as to delimit the review only to those research studies that contribute significantly to this body of knowledge. Physical fitness is defined in terms of cardiovascular efficiency since this has become the best indicator of level of fitness. Thus, acceptable research studies must be based on aerobic fitness programs of adequate duration and intensity to provide a clinically significant fitness training effect. In practical terms, adequate intensity refers to elevation of the heart rate to approximately 70% of capacity for a minimum of 15-20 minutes (Cooper, 1978). The most effective activities to achieve this training condition are jogging, swimming, cycling, skating, handball/squash, and cross-country skiing (Ardell, 1980). The mental health parameters include physical fitness effects on cognition or thought processes; perception; work, sleep, and social behaviors; affect or sense of well-being; and personality variables such as self-concept, body image, and aggression. Each of these variables can be measured on standardized tests and can be rated according to the degree or level of health or wellness.

Clinical studies will be dealt with separately, since sufficient research has been done with psychiatric and mentally retarded clients to draw tentative conclusions about the impact of physical fitness training on these individuals.

A final delimitation of the review of the literature involves the nature of the research design. Many studies reported in the literature have used a one-group posttest-only design, the posttest-only design with nonequivalent groups, or the one-group pretest-posttest design. These types of studies have been classified by Cook and Campbell (1979) as generally uninterpretable because they fail to rule out a number of alternative interpretations. The obvious deficiency of the one-group posttest-only design is the lack of any pretest or control group. The glaring flaw in the posttest-only design with nonequivalent groups is the lack of pretests. Any differences could be simply due to selection. That is, the groups were different to begin with. The one-group pretest-posttest design possesses a great number of potential threats to internal validity. These include history, statistical regression, maturation, and instrumentation. Obviously, scientific conclusions can rarely be inferred from such designs. Therefore, this review will primarily focus on experimental and quasi-experimental research studies.

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1Physical exercise, physical activity, and physical training are used interchangeably in this article to denote a level of cardiovascular function that provides a clinically significant aerobic training effect.
Effects of Fitness Training—Nonclinical Studies

Many studies have used basically healthy subjects to determine the outcome of physical fitness training. This section will be limited to those research studies.

Mental Functioning and Cognition

Is the capacity to learn or function cognitively affected in any way by an individual’s level of physical fitness? So far, few studies have shown equivocal support for this thesis. O’Connor (1969) studied the effect of fitness and motor development activities on the academic success of first graders, but found no significant differences between experimental and nonparticipating control groups. However, the study failed to develop a sufficient aerobic fitness level to adequately measure this variable. Young (1979), on the other hand, reported favorable cognitive improvement as measured by the Wechsler Adult Intelligence Scale in adult males following fitness training, but his preexperimental design tends to limit the power of his reported results. Other studies (Gutin & DiGennaro, 1968; Weingarten, 1973) also indicate improved cognitive performance following physical activity. However, only Weingarten’s study demonstrated sufficient cardiovascular exercise levels and yet his study fails to meet criterion for an experimental design. Even considering some of the limitations in research design, these studies support the notion that for some adults improved mental functioning results from vigorous physical activity.

Behavior

The majority of studies that have sought to develop a link between physical activity and behavioral changes have been related to work behavior. The marketplace is fast becoming an advocate for fitness programs that have been shown to reduce absenteeism, reduce errors, improve productivity, and increase employee attitudes and morale (Donoghue, 1977). The effect of acute exercise training on improved sleep is reported by Folkins, Lynch, and Gardner (1972). Although their male counterparts in the study indicated no change in sleep patterns, the female junior college students reported significant improvement in sleep patterns as well as in life adjustment and self-confidence, and less depression and anxiety. The researchers attributed these differences to the lower initial level of fitness reported by the female subjects. In a related study, Baekeland and Lasky (1966) found that 10 college athletes had more deep sleep (delta sleep) on days when they exercised as compared to no-exercise days. Baekland (1970) showed in a later study that the effects of exercise deprivation for persons accustomed to regular exercise was increased wakefulness, first rapid eye movement (REM) latencies, and REM sleep. He suggested that physical activity allows greater benefit from sleep, which may explain why many regular exercisers report that they feel better and are more alert during the day.

Affect and Quality of Life

Today there is a growing interest in improving the quality of life through health maintenance organizations, wellness centers, and a variety of related programs that seek to promote health and well-being. Much of the attention has centered on the effects of stress on the human organism. Although Hans Selye (1956), an early pioneer in stress research, theorizes that some stress is healthy and necessary for normal function, many people in our fast-
paced western culture are overstressed, which then becomes a source of psychological and physiological disturbance. Approaches to this problem vary widely but generally advocate controlling or reducing the stressors in life or developing more effective coping mechanisms to combat negative or unhealthy stress.

The literature is unequivocal in its endorsement of physical fitness as an effective medium for stress management. Zillmann et al. (1974), using excitation-transfer theory (which deals with the influence of emotional arousal on subsequent emotional experiences) as their conceptual model, demonstrated that high levels of fitness were strongly correlated with ability to cope with provocation or stress. Similar findings are reported by Wilson, Morley, and Bird (1980), who compared mood states between joggers and nonexercisers. Joggers reported significantly less depression, less anger, less confusion, and more vigor than nonexercisers as measured by the profile of mood states adjective check list—previous week form. This evidence supports Michael's (1957) speculation that high fitness strengthens the stress adaptation mechanism, thus providing a degree of protection against emotional stress.

Equally important is the role of physical activity as a coping strategy for reducing somatic anxiety. Here it is important to differentiate between cognitively and somatic-based anxiety since more recent studies seem to indicate a multidimensional nature of anxiety. Schwartz et al. (1978), who developed instruments to measure cognitive and somatic anxiety, found that vigorous physical activity decreased somatic anxiety but had less effect on psychic or cognitive anxiety whereas relaxation techniques decreased cognitive anxiety but had less effect on somatic anxiety. These findings may suggest why Bahrke and Morgan (1978) and Bahrke (1979) report a significant reduction in anxiety with three independent groups of anxious subjects following physical activity, meditation, and a quiet rest session, respectively. Play has also been shown to be an effective medium or coping mechanism for the reduction of cognitively based anxiety (Barnett & Storm, 1981). Finally, Heywood (1978) demonstrated that a physically active or passive activity can reduce tension and anxiety if the activity is perceived by the participants as recreative.

Thus, in assessing the effects of physical exercise on anxiety reduction, care must be taken to avoid defining anxiety in generic or global terms. Also, because most anxiety questionnaires that are used to measure the treatment effect fail to differentiate between cognitive and somatic anxiety, the results of these studies may be unreliable. In summary then, it must be recognized that each person has various coping strategies with which to combat stress. One such resource is vigorous physical activity, which seems to be most effective in reducing somatic or behaviorally related anxiety.

One other observation should be made about the effect of physical training on tension reduction. Several studies (Cantor, Zillmann & Day, 1978; de Vries, 1968; Folkins et al., 1972) show a greater positive response for those subjects who are less fit initially. Such a finding follows logically from the analysis of the research. Research has shown that high fitness is correlated with reduced excitation or reaction to stressful situations (Zillmann et al., 1974). Thus, individuals with low fitness levels have the most to gain from physical training and should experience the greatest reduction in levels of anxiety.

Another affective variable, depression, has frequently been cited as responsive to physical training. Most studies have focused on clinical populations, however. For purposes of consistency those studies are reviewed later in this paper.

Personality Adjustment

Any researchers have attempted to correlate general personality factors with physical less (Buccola & Stone, 1975; Ismail & Young, 1973, 1977; Tillman, 1965; Young &
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Ismail, 1976). The primary instrument used to assess change in personality variables has been Cattell’s Sixteen Personality Factor Questionnaire (16 PF) (Cattell, Eber, & Tat-suoka, 1970). Unfortunately, as noted by Folkins and Sime (1981), this instrument is not sufficiently sensitive to evaluate short-term effects of the physical training intervention. Therefore, the findings in these studies have been inconclusive. Also, many subjects in the research of Ismail and his colleagues were already physically fit when they began the study and, as previously noted, this would substantially alter the results. Given these research design problems, there is little evidence to support or refute claims of significant general personality changes resulting from physical training.

In contrast, research that has focused on univariate personality factors such as self-concept, body image, locus of control, or life adjustment has proven more promising. Body image and self-concept are the most frequent variables studied and have generally been found to be positively affected by physical training. Body image refers to the conscious concept of different parts and processes of the body in terms of their potency, whereas self-concept describes the self in terms of characteristics such as relationships with others, movement, grooming, expressiveness, and achievement (Layman, 1974).

In a particularly well designed experimental study, Hilyer and Mitchell (1979) demonstrated that college students with a low self-concept increased their fitness levels while making similar gains in self-concept. The experiment included a running group, a running group who also received counseling to reinforce the progress made in fitness training, and a control group who met regularly with the instructors but did not run or receive counseling over the 10-week program. Based on the Tennessee Self-Concept Scale (TSCS) (Fitts, 1965), the control group improved their scores slightly on the posttest while the running and counseling groups improved significantly, more than doubling the scores of the control group. The authors suggest that these results indicate an inherent value in a systematic program of physical fitness due in part to a generalized increase in efficiency of physical function. The act of running, of systematically increasing distances and decreasing times, engenders in the student a sense of mastery—an increased sense of control over self and the environment. They add that counseling helped students overcome difficulties and resistance to running while also helping them clarify their values and reinforcing the benefits of exercise (Hilyer & Mitchell, 1979, p. 434).

Other studies have described similar positive results (Collingwood, 1972; Martinek, Cheffers, & Zaichkowsky, 1978; McGowan, Jarman, & Pederson, 1974). Although these results are impressive, some studies have shown significant changes in self-concept without improved levels of fitness (Heaps, 1978; Leonardson, 1977). It appears then that the self-concept may be strongly influenced by a perception of improved fitness rather than actual changes in fitness. Thus, the combination of fitness training and counseling (Hilyer & Mitchell, 1979) would seem to reinforce this effect and might explain its apparent success. This finding is supported by Jasnoski, Holmes, Solomon, and Aguiar (1981), who found that personal changes (confidence, frustration, tolerance, etc.) were not related to changes in fitness but appeared to be related to variables such as group participation and expectancies. So, although it can be said that self-concept has been shown to be positively correlated with increased levels of fitness, the direct relationship between these two variables is still in question.

Effects of Fitness Training—Clinical Studies

To this point the majority of the studies reviewed have used subjects who were conside
Clinically healthy. Physical exercise or therapeutic activity, as it is sometimes called, has been used for centuries as a medium for restoring health to those who were physically and/or psychologically ill. More recently, physical fitness training as a treatment modality has been popularized by both clinicians and advocates for fitness, who claim, for example, "running should be viewed as a wonder drug analogous to penicillin, morphine, and the tricycles. It has profound potential in preventing mental and physical disease and in rehabilitation after various illnesses have occurred" (Morgan, 1979b, p. 58). This section reviews research that evaluates claims such as these as they apply to subjects who have problems in mental health.

Depression

Depression is one of the most common causes of psychological dysfunction in our society today. Many theories have been developed to explain this phenomenon and various treatments have been used to modify or counteract its effects. Recently, several studies have suggested that physical training or running is an acceptable alternative somatic treatment for minor or moderate depression (Conroy, Smith, & Felthous, 1982; Griest, Klein, Eischen, Fari, Gurman, & Morgan, 1979; Homeier, 1981). Clinically depressed outpatients were used as subjects in each study except in the one by Conroy, Smith, and Felthous (1982), who used 17 subjects classified as having personality and psychotic disorders and who were hospitalized at the C.F. Menninger Hospital. The Menninger study was the most comprehensive, with eight different physiological, behavioral, and psychological measures taken before, during, and after the 6-week program. The only significant unequivocal finding was the improvement in the affective or depression measures. The authors speculated other benefits may have been significant had the training been more rigorous and sustained beyond 6 weeks. Other outpatient studies show similar results, although Homeier (1981) found jogging treatment to be less effective than cognitive therapy in reducing comprehensive effects of depression. Griest et al. (1979), using a similar research design, found a systematic supervised running program to be at least as effective as psychotherapy in reducing depression scale scores. Such discrepancies in comparisons with psychotherapy and counseling modalities are not uncommon since consistent effects of psychotherapeutic interventions are difficult to predict.

In spite of differences among various aspects of the studies, all have endorsed vigorous physical activity as an effective way to reduce symptoms of depression. Just how and why this change occurs is more difficult to answer. Griest and his colleagues (1979) suggest that, "individuals who become independent runners develop a sense of success and mastery of what they correctly perceive as a difficult skill" (p. 48). If this change is considered in relation to Seligman's (1972) "learned helplessness" hypothesis, which describes a general characteristic of reactive depression, one can readily see how running or physical training may be useful in counteracting self-depreciating feelings. Another hypothesis suggests the nature of acute physical activity forces more authentic self-assessment, which facilitates the healing process (Anderson, 1979). Physiological factors also seem to be closely related to depression and changes in body chemistry as a result of exercise. Norepinephrine, a chemical substance produced by the brain, has been shown to be lower in depressed subjects than in a nondepressed control group (Schildknant, 1965). Physical exercise increases the production of norepinephrine as much as four and one-half times the preexercise value (Howley, 1976), a result similar to that of using amphetamines. It is this same phenomenon which has been reported to cause "negative addiction" in some persons who found themselves addicted to their exercise "fix" (Morgan,
Thus, some have concluded the body has natural antidepressants that are activated by vigorous physical activity.

Although the previously cited studies appear to be well designed and provide solid empirical support for the positive effects of physical fitness training on depressive illness, more research is needed to substantiate these findings and determine why these observed changes occur.

Anxiety

A second debilitating affective psychological state is anxiety. Although most individuals experience some level of anxiety daily, others may experience disproportionate amounts when viewed within the context of a specific situation. The level of anxiety may be more intense and may be sustained for a longer period of time than is warranted by the object of the anxiety. As has been noted earlier, anxiety has generally been viewed as a global internal state which has been a major cause of psychosomatic illness. However, the research presented by Borkovec (1976), Schalling, Cronholm, and Asberg (1975), Schwartz, Davidson, and Goleman (1978), and others suggests a multidimensional nature of anxiety is a more accurate description of this mood state. As with nonclinical subjects, most of the anxiety research on clinical subjects has used unidimensional anxiety scales such as the Spielberger, Gorsuch, and Lushene (1970) State-Trait Anxiety Inventory (STAI) to determine treatment effect. Nevertheless, physical fitness training has been found to reduce global anxiety under certain conditions (Driscoll, 1976; Morgan, 1979a, Reiter, 1981).

As treatment methods for psychosomatic related illness caused by anxiety are assessed, it is imperative to understand the nature of the effects of a given treatment. Lion (1978), for example, considered the cognitive and somatic aspects of anxiety in his study but determined the running program decreased both cognitive and somatic anxiety responses. This is not surprising since he used the STAI as his primary measure of anxiety. Schwartz and his colleagues (1978), however, clearly differentiate between these responses using more precise measurement scales. Their findings show that significant decreases in somatic anxiety are highly correlated with physical activity, while decreases in cognitive anxiety are correlated with meditation and similar relaxation interventions. Using an instrument such as the Cognitive-Somatic Anxiety Questionnaire (Schwartz et al., 1978) would seem to provide the researcher with more valid results and have greater implications for the application of these findings.

In a physiological study, de Vries (1968) reported that acute physical activity had the same effect as tranquilizers for reducing tension in the neuromuscular system. He found that acute and chronic exercise reduced the resting muscle action potential (MAP)—a condition which is elevated in anxious and depressed patients (Martin, 1956; Whatmore & Ellis, 1959). He concluded that vigorous physical exercise appears to provide significant relief from hyperactive neuromuscular states.

Similarly, anxiety has been linked with excessive lactate in the blood stream due to an anaerobic (without oxygen) metabolism process. Aerobic activity has been shown to reduce lactate production (Clarke, 1975; Larson & Michelman, 1973) in a similar fashion to that of propranalol, a drug considered to be the treatment choice in anxiety states (Suzman, 1976). Just as the body is stimulated to produce natural antidepressant chemicals, it appears there is a natural physiological process for coping with anxiety.

Ledwidge (1980) proposes yet another rationale for the effect that physical activity has on anxiety. He suggests a graded exposure to the distress of exercise disen-
the individual to the somatic component of anxiety. Thus, the individual develops a sense for the symptoms of anxiety through a process of cognitive relabeling. That is, the subject is no longer frightened by lower levels of palpitations, fatigue, and a sense of futility. Alternatively, Davidson and Schwartz (1976) hypothesize that vigorous physical exercise demands total involvement of the somatic and cognitive systems. Exogenous impediments are thus replaced by different, apparently less anxiety-provoking stimuli. This, they suggest, accounts for the postexercise periods of minimal anxiety since the organism has been purged of tension-producing stimuli. As with previous speculations about the cause and effect relationship between mental health variables and physical fitness training, it is likely that many of the factors play some part in the training effect which has been shown to occur rather consistently under certain conditions.

Other Conditions

Although several studies have reported the effects of fitness training on psychotic, alcoholic, and socially deviant subjects (Clark, Wade, Massey, & Van Duke, 1975; Conroy et al., 1982; Dodson & Mullens, 1969; Powell, 1974), all either failed to provide adequate conditioning to produce a training effect or used improper research design techniques. These studies do indicate that significant physiological changes can occur in relatively short periods of training (2 to 3 weeks), but as previous findings have shown, only intense, sustained training seems to have the potential to modify psychological variables.

One problem with fitness studies in mental retardation has been the lack of achieving sufficient conditioning to adequately test hypotheses. Nonetheless, several studies with mentally retarded children have shown gains as a result of rather mild physical activity. Studies show physical development as a key factor related to improvements in body image (Chasey, Swartz, & Chasey, 1974), intellectual function, and social skills (Brown, 1977). However, a positive relationship between measurable improvement in physical fitness and performance on intelligence tests has been found for retarded boys. Oliver (1958) found that institutionalized educable mentally retarded boys who participated in a 10-week physical conditioning course made highly significant gains in physical qualities and abilities. The experimental group also outperformed a matched control group, who did not receive the conditioning course, on three of five tests of mental intelligence. Corder (1966) used Oliver's research as the basis for a more sophisticated experimental study done with noninstitutionalized educable mentally retarded boys. Corder's conditioning group made significant gains over the other subjects on all seven physical fitness tests administered. The conditioning group also made significant gains in mean IQ scores over the control group, although there was no significant difference between the conditioning group and boys assigned to an officials group. Corder speculated that a Hawthorne effect may have been operating with the officials group. The highly positive effects of conditioning programs, ranging from relatively moderate to those of a more vigorous nature, may be due to the typical sedentary lifestyle of many retarded individuals. Physical stimulation is obviously a very important aspect of development for all that appears to be even more critical for mentally retarded persons.

Conclusions and Implications

Several conclusions can be drawn from this review of the literature. First, the findings
that describe the relationship between physical fitness and mental health varia
equivocal. In spite of what some enthusiasts would claim, one cannot infer that exer-
se is a panacea for all psychological problems. However, there is sufficient s
for a limited endorsement of the value of physical exercise for individuals with i
health problems. Although much more research is needed to confirm tentative rest
previous studies, substantial data indicate that mild levels of depression and anxiet
pond favorably to regular vigorous physical activity.

After a critical analysis of the studies, it must also be concluded that mo
the studies were poorly designed. Nearly half were one-group preexperimental stu
which tend to have built-in selection bias and will statistically reflect a regression ef
on the posttest. Fortunately, several true experimental studies have confirmed certain asp
of these findings and provide a more valid perspective on the results. More studies
this type are needed to substantiate these findings if therapeutic programs are to be us
to treat anxiety, depression, or low self-concepts through vigorous physical activity. Ideall
experimental designs will be employed in future studies. Cook and Campbell (1979) pr
vide solutions to many problems encountered in conducting experimental studies in fiel
settings, including withholding treatment from control groups, attrition from experiments
and implementing unobtrusive treatment. In situations in which experimental designs are
not practical, Cook and Campbell offer quasi-experimental designs for nonequivalent control
groups, time-series studies, and passive observation. A second aspect of employing valid
research methodology is the nature of the treatment itself. In many studies the subjects
did not achieve an acceptable cardiovascular fitness level to adequately determine a treat-
ment effect. Future studies must include exercise of sufficient intensity and duration to
qualify for a true physical training experience.

A third factor that emerges from the literature is the need to individualize
physical training programs to meet the specific needs of the individuals involved, par-
ticularly in regard to the treatment of anxiety and depression. Using relaxation activities
to decrease cognitive anxiety and physical exercise to decrease somatic forms of anxiety
would seem more appropriate than arbitrarily placing all clients in one or the other treat-
ment. Similar considerations are likely for those who experience depression, although the
evidence is less clear as to what factors should be considered in the prescription process.
In addition to the client’s physical condition, probably the most significant element is the
level of the depression. Mildly depressed individuals appear to respond more favorably
to fitness training than those who are deeply depressed.

It can also be concluded that physically unfit persons show greater
improvement in psychological variables as a result of physical training than those who
are fit prior to training. Some may be tempted to suggest that only physically unfit in-
dividuals will receive measurable psychological benefits from physical exercise. This does
not appear to be a valid conclusion, based on the findings of Zillmann et al. (1974). Rather,
the type of assessments and processes used to determine treatment effect simply fail to
test for the effect of greater or lesser fitness. Such is the case with preexperimental design
studies which, as noted, are inadequate attempts to determine the true nature of the treat-
ment phenomenon. Well controlled studies that are sensitive to the level of fitness, and
are able to compare their corresponding influence on selected mental health variables,
are needed for a better understanding of this apparent inconsistency in the findings.

From the research findings one can also conclude that physical exercise can
have a direct effect on behavior change. Concerning retarded persons and geriatric clients,
the level of physical activity was not always as significant as the activity itself. That is,
although these special populations did not achieve aerobic conditioning, they demonstrated
significant change in mental health variables. Group participation and social acceptance appear to be important contributors to the personality changes in the individuals. Thus, group activity that emphasizes fitness objectives as well as social interaction is more likely to benefit these clients than singular or one-on-one forms of activity.

Facilitating mood changes and having a direct impact on client behaviors will place new responsibilities on the helping professionals who conduct physical activities. The most obvious need would be to become familiar with physical fitness training techniques. Since the training itself is designed to physically stress the body to 70% of maximum function, it is important to have an in-depth understanding of the physiological processes involved in exercise; one also should possess such skills as cardiopulmonary resuscitation (CPR) in the prevention or treatment of training-related injuries. Training programs in clinical settings are often complicated by the variety of medications used to treat physical and psychological disorders. Studies have shown that vigorous physical activity may heighten the client's sensitivity to pharmaceutical agents and cause overreactions. These factors and others suggest that clients who participate in physical activity should be closely supervised by qualified personnel including a physician. Stringent protocols should be developed that outline specific physical and psychological criteria for all participants, screening procedures, exercise prescriptions, graded exercise program descriptions, supervision, and emergency procedures. The point is, although physical fitness programs may be attractive additions to therapeutic activity programs in clinical settings, extreme care must be taken to protect the safety of the clients and to avoid compromising the legal liability of the professional staff involved.

Positive relationships have been clearly demonstrated between physical training and selected mental health variables. Both the provision of therapeutic activity in clinical settings and the promotion of physical activity and relaxation as essential elements for healthful living seem to be worthy functions of health care professionals. Given the qualifications outlined above, physical training should become an increasingly popular medium for preventing and treating various mental health maladies.

References


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