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for the Psychotherapist**

**By Jerry M. Lewis**

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## **Overview: Clinical and Physiological Comparison of Meditation with Other Self-Control Strategies**

BY DEANE H. SHAPIRO, JR., PH.D.



## Overview: Clinical and Physiological Comparison of Meditation with Other Self-Control Strategies

BY DEANE H. SHAPIRO, JR., PH.D.

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*In 1977 the American Psychiatric Association called for a critical examination of the clinical effectiveness of meditation. The author provides a review of the literature bearing on clinical and physiological comparisons of meditation with other self-control strategies. He begins by providing a definition of meditation and then cites the literature comparing meditation with such self-regulation strategies as biofeedback, hypnosis, and progressive relaxation. He pays particular attention to the "uniqueness" of meditation as a clinical intervention strategy as well as the adverse effects of meditation. Finally, he offers suggestions and guidelines for future research.*

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To my knowledge, there have been four major reviews of the meditation literature. Woolfolk (1) and Davidson (2) reviewed the physiological effects of meditation, and Smith (3) and Giber and I (4) reviewed the psychotherapeutic and clinical effects. All four of these reviews are substantial and provide a thorough discussion of the literature available at the time they were written. However, in the past few years there has been a dramatic increase in the empirical literature. This new literature is methodologically more sophisticated and goes beyond comparing the effects of meditation with baseline observations or comparing a group trained in meditation with a control group. Instead, the newer studies compare meditation with other self-regulation strategies such as biofeedback, hypnosis, and progressive relaxation. These more recent studies are in keeping with the following recommendation of the American Psychiatric Association (5):

The Association strongly recommends that research be undertaken in the form of well-controlled studies to evaluate the specific usefulness, indications, contraindications, and dangers of meditative techniques. The research should compare the various forms of meditation with one another and with psychotherapeutic and psychopharmacologic modalities.

In a previous paper (4) Giber and I reviewed the literature to determine whether meditation might be a clinically effective strategy for certain clinical problems, such as stress and tension management, the addictions, and hypertension. We reviewed "first-round studies," which generally consisted of anecdotal single case studies or a comparison between a meditation group and a control group rather than between groups given different self-regulation strategies. The more sophisticated question that clinicians and psychotherapists now need to ask is not just whether a technique "works" but when that technique is the treatment of choice for which particular patient with what type of clinical problem.

In order to help clinicians make that determination, and following the recommendation of APA's position statement, in this paper I review the literature comparing meditation physiologically and clinically with other self-regulation strategies. I then comment on the adverse effects of meditation so that clinicians might be sensitive to indications and contraindications. Finally, I offer guidelines and suggestions for future research.

### MEDITATION: TOWARD A WORKING DEFINITION

One of the problems in studying meditation is the lack of a clear definition. Because of its effects, some have tried to define it as a relaxation technique (6). This raises problems similar to those encountered in the literature on relaxation (7), in which a relaxation technique is defined as one producing certain effects—decreased skeletal muscular tension and decreased sympathetic arousal, for example. However, defining the independent variable by its dependent variable—its effects—is tautological and unsatisfactory as a complete definition.

Another problem with defining meditation is that there are so many different types of meditation techniques. Some involve sitting quietly and produce a state of quiescence and restfulness (8). Some involve sitting quietly and produce a state of excitement and arousal (9, 10). Some, such as the Sufi whirling dervish, tai chi, hatha yoga, and Isiguro Zen, involve physical movement to a greater or lesser degree (11, 12). Sometimes these "movement meditations" result in a state of excitement, sometimes a state of relaxation (2, 13).

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Accordingly, depending on the type of meditation, the body may be active and moving or relatively motionless and passive. Attention may be actively focused on one object of concentration to the exclusion of the other objects (14). Attention may be focused on one object, but as other objects, thoughts, or feelings occur, they too may be noticed and then attention returned to the original focal object (Vipassana and transcendental meditation, for example). Attention may not be focused exclusively on any particular object (Zen's shikan-taza, for example) (15, 16). However, there seem to be three broad general groupings of attentional strategies in meditation: a focus on the field (mindfulness meditation), a focus on a specific object within the field (concentrative meditation), and a shifting back and forth between the two. This fits in nicely with brain attentional mechanisms, which Pribram (17) described as similar to a camera and of two types. The first type is a focus similar to a wide-angle lens—a broad, sweeping awareness taking in the entire field (mindfulness meditation). The second type is a focus similar to a zoom lens—a specific focusing on a restricted segment of the field (concentrative meditation).

Using attentional mechanisms as the basis for the definition, therefore, we may state that *meditation refers to a family of techniques which have in common a conscious attempt to focus attention in a nonanalytical way and an attempt not to dwell on discursive, ruminating thought.*

There are several important factors in this definition. First, the word "conscious" is used. Meditation involves intention: the intention to focus attention either on a particular object in the field or on whatever arises. Second, the definition is noncultic. It does not depend on any religious framework or orientation to understand it. I do not mean to imply that meditation does not or cannot occur within a religious framework. However, what meditation is and the framework within which it is practiced, although they are interactive, are two separate issues and need to be viewed as such. Therefore, although there may be overlap in terms of the concentration on a particular object or repetition of a sound or phrase, we should not a priori equate meditation with prayer. This is particularly true when the intent of the prayer has a goal-directed focus outside oneself (e.g., asking a higher power to absolve one of one's sins).

Third, the word "attempt" is used throughout. This allows us to deal with the process of meditation. Because meditation is an effort to focus attention, it also involves how we respond when our attention wanders, or how we respond when a thought arises. There is a continuum of instructions from very strong to very mild in terms of how to deal with thoughts (18). For example, Benson (6) instructed students to ignore thoughts, Deikman (19) said to exclude them, and a 5th-century Buddhist treatise said, "With teeth

clenched and tongue pressed against the gums, . . . by means of sheer mental effort hold back, crush and burn out the thought" (20). The Vipassana tradition instructs one to merely notice and label the thought (thinking thinking) and Zen to merely notice, observe with equanimity, and, when weary of watching, let go (21).

Fourth, there is an important "metamessage" implicit in the definition: namely, the *content* of thoughts is not so important. They should be allowed to come and go. Consciousness, or awareness of the *process* of thoughts coming and going, is more important. The context—conscious attention—is the most important variable. Although cognitions and images may arise, they are not the end goal of meditation. Thus, although there may be overlap in content, we should not a priori equate meditation with techniques of guided imagery (22), daydreaming (23), covert self-instructional training (24), hetero-hypnosis (25), self-hypnosis (26), or other cognitive strategies (27).

By describing meditation techniques precisely and by having experimenters report accurately all procedures used, meditation techniques are described behaviorally and may be compared both clinically and physiologically with other cognition-focusing, relaxation, and self-regulation strategies.

#### PHYSIOLOGICAL COMPARISONS

There was initial enthusiasm that meditation might be a unique self-regulation strategy (28). This position was based on certain first-round clinical studies and physiological findings. However, Benson (6, 29) argued that the physiological response pattern found in meditation was not unique to meditation per se but common to any passive relaxation strategy. This view has been supported and replicated by a number of studies that suggest no physiological differences between meditation and other self-regulation strategies and, often, no differences between meditation and "just sitting."

For example, early first-round studies suggested that skin resistance significantly increased within subjects (8, 30) and in a transcendental meditation group compared with a control group (31). Recent studies (32–37), however, showed no significant differences in galvanic skin response between meditation and other self-regulation strategies, including self-hypnosis, progressive relaxation, and other modes of instructional relaxation. Further, the studies cited also showed no difference between meditation and other self-regulation strategies in heart rate or respiration rate.

Morse and associates (32), in a rather complex study, noted that neither respiration rate, pulse rate, nor systolic and diastolic blood pressure differentiated experimental conditions. These authors noted that the physiological responses to transcendental meditation



and simple word meditation were similar and concluded that "relaxation, meditation, and relaxation hypnosis yield similar physiological responses suggestive of deep relaxation." Other studies found no difference in effect on respiratory rate between meditation and progressive relaxation (unpublished data of Pagano and associates) or between meditation and listening to music (38). Fenwick and associates (38) noted that subjects who were tense to begin with showed greater relaxation in response to both meditation and listening to music than subjects who were not and suggested that Wallace and associates' findings of increased skin resistance in meditators (8) may have been due to high initial levels of metabolism and tension.

Glueck and Stroebel (39) also suggested that meditation might be characterized by a unique EEG pattern—the synchronization of slow alpha. However, Travis and associates (37) noted that a striking effect was the *lack* of alpha EEG during transcendental meditation, and Morse and associates (32) noted that when synchronization of slow alpha occurred it was not unique to transcendental meditation but was found in all the relaxation conditions they studied.

A similar lack of metabolic uniqueness has been found by other investigators. Michaels and associates (40) attempted to differentiate meditators from resting control subjects biochemically. Because stress increases blood catecholamines, the experimenters looked at plasma epinephrine and norepinephrine as well as plasma lactate. Twelve experienced meditators (more than 12 months' experience) were compared with control subjects matched for sex and age who rested instead of meditating. There were no significant fluctuations of plasma epinephrine during meditation. No significant differences were observed between control subjects and meditators. The same held true for plasma lactic acid concentration. These findings failed to replicate Wallace's earlier findings on transcendental meditation (30).

More recent studies further call into question the uniqueness of meditation's effects. In 1976, Goleman and Schwartz (41) showed increased responsiveness of meditators to an upcoming stressful event on a film and a quicker recovery time in comparison with a relaxing control group. However, from a cognitive standpoint, in terms of number of poststress intrusive thoughts, significant differences between meditators and control subjects have not been detected (42). Further, theories suggesting that transcendental meditation is unrelated to sleep have recently been called into question by Pagano and Frumkin (43) and Younger and associates (44), who noted that at least beginning meditators may spend an appreciable part of their time in sleep stages two, three, and four.

Thus it appears that the original belief that we would be able to discriminate meditation as a unique physiological state has not been confirmed—on either an autonomic or a metabolic level or in terms of EEG

pattern. Although it seems clear that meditation can bring about a generalized reduction in many physiological systems, thereby creating a state of relaxation (2, 4), it is not yet clear from the available data that this state is differentiated from the effects of other relaxation techniques, whether they be hypnosis (33) or deep muscle relaxation (32, 34, 35, 37). Most studies have found that the constellation of changes is significantly different between meditation groups and placebo control groups but not between meditation and other self-regulation treatments.

In fairness, it should be noted that although the results thus far seem quite convincing that there is no physiological difference between the effects of meditation and other self-regulation strategies, they are not unequivocal. For example, Elson and associates (45) compared a "wakefully relaxed" group and a group of AnandaMarga meditators. They noted that the meditators experienced an increase in basal skin resistance and a decrease in respiratory rate, changes which were not observed in the control subjects. Further, 6 of the 11 control subjects fell asleep, but none of the meditators fell asleep. The alpha and theta EEG activity of the meditators remained in a relatively stable state. In addition, Jevning and O'Halloran (46) suggested that there might be changes in blood flow that are unique to meditation.

Some authors would disagree with the way in which I have interpreted the literature. For example, Jevning and O'Halloran (46) stated that additional unique physiological response patterns will be found in meditators and that current findings do not reflect this simply because we do not have physiological measures sensitive enough to ferret out the unique aspects of meditation compared with other self-regulation strategies. They also noted that one must be careful in generalizing from beginning meditators, who may in fact fall asleep and whose physiological changes may not be different from individuals practicing other self-regulation strategies. There is no assurance, they correctly noted, that beginning practitioners will have anything like the dramatic physiological changes of advanced meditators who have spent decades perfecting their practice. However, they also pointed out that in order to determine if meditation is truly unique, these advanced practitioners would have to be compared with advanced practitioners of other self-regulation strategies.

#### CLINICAL COMPARISONS

Findings of meditation's nonuniqueness are also being reported on a clinical level. Meditation appears to be equally but no more effective than other self-regulation strategies for such problems as anxiety (36, 47-52), anxiety in alcoholics (53), alcohol consumption (54), insomnia (55), and borderline hypertension (56).



The self-regulation strategies compared with meditation included progressive relaxation (36, 45, 48, 54, 55), Benson's relaxation response (47, 54), a pseudo-meditation treatment (49), antimediation treatments (36, 49, 50), self-administered systematic desensitization (51), and cardiovascular and neuromuscular biofeedback (56, 57).

Two studies involving clinical comparison of self-regulation techniques seem representative (51, 54). First, Marlatt and associates (54) described a nicely designed study of heavy social drinkers during a 2-week pretreatment baseline phase, a 6-week treatment phase, and a 7-week follow-up. There were four groups: a meditation group (using Benson's method) (6), a progressive relaxation group, a group practicing bibliotherapy (called an "attention placebo"), and a no-treatment control group that was monitored and took all the tests. This study is one of the first in which there was a specific, clearly spelled-out theoretical rationale between the independent variables (relaxation procedures) and the dependent variable (decrease in alcohol consumption). Results suggested that relaxation training, whether it was meditation, progressive relaxation, or "attention placebo," had a significant effect on the consumption of ethanol compared with no treatment. However, there were no significant differences between the three different relaxation training groups.

Second, Kirsch and Henry (51) assigned 38 "highly motivated" subjects who had a great deal of anxiety about public speaking to four groups: 1) a desensitization-relaxation group, which was given instructions for relaxation training, hierarchy construction, and imagery-relaxation pairing, 2) a desensitization-meditation group, which was identical to the first group except that instructions in meditation similar to Benson's (6) replaced instructions in relaxation training, 3) a meditation-only group, which was given instructions in meditation and in relaxation training but not in hierarchy construction or imagery-relaxation pairing, and 4) a no-treatment group. The treatment phase lasted 3 weeks, and pre- and posttreatment assessments of pulse rate and performance anxiety were made. Results showed that improvement occurred in all three treatment groups according to self-report and behavioral measures and that this improvement was significantly greater than improvement in the no-treatment control group. However, there were no significant differences in improvement between the three treatment groups.

The data from these clinical studies seem to indicate that meditation is no more effective than other self-regulation strategies on a wide variety of clinically relevant variables. It should be noted, however, that my interpretation of the data is not without its critics. The critics point to the studies of Vahia and associates (58, 59) and Glueck and Stroebel (39), which found that meditation was more effective than pseudo-yoga

(58, 59) and biofeedback (39). However, I believe it could be argued that therapists' belief in the efficacy of the treatment (3) may have been a critical confounding factor in the studies of Vahia and associates. Further, the fact that Glueck and Stroebel's study was conducted at the Institute for Living, where a great deal of research on transcendental meditation was being conducted, could have caused strong demand characteristics, possibly accounting for subjects' continuing to adhere to the transcendental meditation program while dropping out of the biofeedback treatment group.

#### ADVERSE EFFECTS AND CONTRAINDICATIONS

Carrington and Ephron (60) as well as Stroebel and Glueck (61) pointed out the importance of the therapist's availability to psychiatric patients to aid with any material that comes into the patient's awareness. Therefore, Carrington (18) noted that meditation should not be prescribed for borderline psychotic or psychotic patients unless their practice of it can be supervised by a psychotherapist familiar with meditation. In this regard, almost all meditation researchers and those who use it in their clinical practice caution that the therapist should provide careful instruction, training, and follow-up observation. This is especially true as we become more sensitive to unpleasant and adverse experiences patients sometimes have during meditation (62-68). These feelings may include occasional dizziness, feelings of dissociation, and other adverse feelings produced by the release of images, thoughts, and other material that they had not been sensitive to. In addition to anecdotal reports, to my knowledge there have been three case reports in the literature suggesting that meditation has negative effects (63, 67, 68). There is also one study with a large number of subjects (64) that discussed potential adverse effects of meditation.

Otis (64) reanalyzed data he had collected previously and examined particular subjects who had reported a considerable increase (51% or over) of negative feelings. He found that the longer an individual meditated, the more likely it was that adverse effects would occur. These adverse effects included increased anxiety, boredom, confusion, depression, restlessness, and withdrawal. Otis also noted that teacher trainees who were long-term meditators reported more adverse effects than long-term meditators who had not made a commitment to become teachers. Although there are many ways to analyze these data, it seems that there is a subgroup of people for whom meditation will have negative effects.

For example, certain individuals seem to be attracted to meditation for inappropriate reasons, seeing it as a powerful cognitive avoidance strategy. Some are attracted to the technique of concentrative meditation as a way of blocking out unpleasant areas of their



lives. Similarly, many individuals who lack basic social skills (i.e., those who are shy or withdrawn) may be attracted to meditation. For all of these individuals meditation may not be a useful therapeutic intervention (certainly not as a sole intervention strategy). Rather, it may be more appropriate for them to have some kind of social skill or assertiveness training, either in place of or in addition to meditation treatment (68).

Meditation may not be a useful therapeutic intervention for chronically depressed individuals, who may need to have their arousal level activated (this might also be the case for hypotensive adults and hyperactive children). Many therapists consider arousal one of the prime conditions facilitating therapeutic change (69); therefore, meditation would not be considered a treatment of choice if used as a strategy to calm or relax a person. In addition, it may not be a useful strategy for individuals with high somatic but low cognitive activity (7). Meditation may not be the treatment of choice for individuals whose locus of control is very external (47) or those with clinical problems such as migraine headaches or Raynaud's disease, which Stroebel and Glueck (61) noted might be better treated with temperature and EMG biofeedback to elicit vasodilation and muscle relaxation.

There are additional issues to be considered regarding negative effects. Is the individual meditating for too long a time, thereby impairing reality testing (63, 67)? Is the person spending too much time letting go of thoughts (not analyzing them) and therefore not gaining pinpointed cause-and-effect awareness? If so, then, even though an inappropriate affect may be reduced, has the person learned the antecedent conditions that caused the inappropriate maladaptive behaviors? Has he or she learned, in addition to skills of letting go of thoughts and goals, the skills of setting goals—existentially choosing who he or she wants to be and how he or she wants to act.

There is also the important issue of preparation. Negative effects may occur if the individual has not been given sufficient preparation for meditation. For example, a self-critical, perfectionistic, Western-goal-oriented individual who learns meditation will probably bring that same cognitive orientation to the task of meditation. He or she may, therefore, be highly critical (e.g., I am not doing it right); each thought may be seen as defeat, and an internal fight might ensue to stop "thoughts." As one patient said to me, "I became distracted by thoughts, then worried about being distracted; but I couldn't stop the flood of thoughts; I started crying; it was almost impossible for me to then return to breathing."

My hope in presenting this discussion of adverse effects is twofold. On the one hand I would like to insert a note of caution into the "hosannahs" with which many greet meditation. The transpersonal or spiritual perspective gives an answer elegant in its

simplicity for dealing with adverse effects: "Watch the process. Don't get caught up in it. Let it be a learning experience for yourself, a new awareness of your resistance and defenses. Keep the context." The answer to every dilemma becomes, "Adverse effects are only part of the path. Stay centered. It takes years of practice." Eastern philosophy, with a world view espousing acceptance, says that all things, good and bad, should be accepted with equanimity. Philosophically and theoretically, once a person can do that, life becomes free from suffering, as the Buddha noted in his Four Noble Truths. On the one hand I subscribe to this advice. On the other hand I find it too absolute; it strikes me as similar to the classic psychoanalytic dictum: insight causes cure. If you are not cured, by definition you need more insight. Similarly, if you are not keeping the context, practice keeping it more.

As clinicians, I feel we need to exercise extreme caution in using a technique like meditation; we need to be sensitive to some of the adverse effects that may occur with patients for whom we prescribe it. On the other hand, I believe meditation is an extremely powerful technique that can bring a great deal of good to many patients. I do not want it to be too readily dismissed by the scientific community just because the initial global claims of its effectiveness do not appear to be warranted. My hope is that we can develop a cautious approach to the use of meditation, neither overstating its worth nor arbitrarily dismissing it.

#### FUTURE DIRECTIONS

There are five different directions that I feel clinically oriented research could profitably pursue. First, I believe we need to look more carefully at the context of meditation. In particular, this would involve an understanding of individuals' expectations in learning meditation as well as some assessment of the demand characteristics of the teacher/training organization (70, 71). Most religious traditions have a series of preparations that must be made before an individual is thought to be ready to begin the spiritual practice of meditation (72, 73). These preparations range from the highly structured and complex—changing dietary habits, cultivating feelings of love and compassion, decreasing thoughts of selfishness and greed—to much less complex—preparatory lectures and instructional training. Additional contextual variables would include motivation and the role of individual responsibility (74, 75).

A second issue that must be addressed is a component analysis of meditation to separate the active from the inert aspects. In other words, how much of meditation's effects is due to antecedent variables of preparation, environmental planning, and components of the behavior itself—physical posture, attentional focus and style, and breathing? By breaking meditation into its various components, it might be possible to deter-



mine which aspects of meditation might be profitably combined with other self-regulation strategies (76-79).

A third area that might be profitably pursued involves a refinement of the dependent variable. For example, as noted, Davidson and Schwartz (7) suggested that anxiety has both a cognitive and somatic component, and meditation may be more effective for reducing cognitive anxiety while doing relatively little for somatic anxiety.

A fourth approach involves examining subject variables (47, 80). This approach attempts, on the basis of certain pretest indicators, to develop a subject profile of those for whom meditation is likely to provide a successful clinical intervention and those for whom there may be adverse effects (81).

All four of these refinements would enable us to become more precise in choosing the correct clinical intervention (or combination of interventions) for a specific individual with a specific clinical problem.

A final approach involves looking at the phenomenology of meditation. This approach, valued by the Eastern tradition for centuries, is just beginning to gain favor within the Western scientific community. Despite methodological and conceptual problems (82), researchers are beginning to note its importance. For example, although Morse and associates (32) found that there were no significant differences in physiological responses to three relaxation states, they pointed out that there were significant differences in the subjects' evaluations of these states, as did Gilbert and associates (83). Therefore, Morse and associates cited and concurred with Charles Tart's remark that "in [the] subject's own estimate of his behavior, an internal state is a rich and promising source of data which some experimenters tend to ignore in their passionate search for objectivity." Similarly, Curtis and Wessberg (35) noted that more subjective positive changes were reported by the meditation group than by the control relaxation group even though there was no difference on physiological measures. They suggested that if meditation has a unique effect, it seems to be different from a visceral or neuromuscular effect.

If meditation is a unique technique, its uniqueness may not be as a self-regulation strategy, and therefore it will not differ from other self-regulation strategies clinically or physiologically. Its uniqueness may be seen, however, in the way the individual experiences it. The phenomenological or subjective experiences of meditation—meditation as an altered state of consciousness (2, 4, 68)—may be an important and critical area for future scientific examination.

Setting aside the question of meditation's uniqueness, however, we are now confronted by the issue of developing more precision as to when to use meditation rather than other self-regulation strategies. Although meditation seems to be no more effective as a clinical intervention than other self-regulation strategies, this is not a reason either to use or not to use

meditation. It appears that we now have several self-regulation strategies which are more effective than controls in the alleviation of certain clinical problems. We are now faced with the task presented at the start of this paper—to design more sophisticated and precise research strategies in order to help clarify which self-regulation strategy is the treatment of choice for which patient with what clinical problem.

I hope that the definition developed at the start of this paper, the update of the literature on clinical and physiological studies that has been provided, and the guidelines and suggestions presented here will help researchers evolve that necessary next step of methodological sophistication.

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