

The Effects of the Transcendental Meditation Technique on Common Risk Factors and Overall Health

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Transcendental Meditation (TM), as taught by Maharishi Mahesh Yogi, is a simple mental technique which has well-documented benefits for health and well-being [1, 2]. It is practiced for 15-20 minutes twice daily, while one is sitting comfortably with eyes closed. It can be learned easily by anyone regardless of age, educational background, or culture. The technique is effortless and requires no belief or any change in lifestyle or diet. During TM mental activity settles down in a natural way, while alertness is maintained and even enhanced.

The Transcendental Meditation technique has been taught around the world for the past 40 years. Instruction involves a standard seven-step course taught by qualified teachers who have undergone an extensive and systematic training program, ensuring quality and consistency in instruction worldwide.

Research on the Transcendental Meditation technique has been conducted at more than 200 universities, hospitals, and research institutions in 30 countries. To date, more than 500 research and review papers have been written covering a wide variety of physiological, psychological, and sociological effects. These have been collected in six volumes of research papers, of which over 150 are reprinted from scientific journals [1].

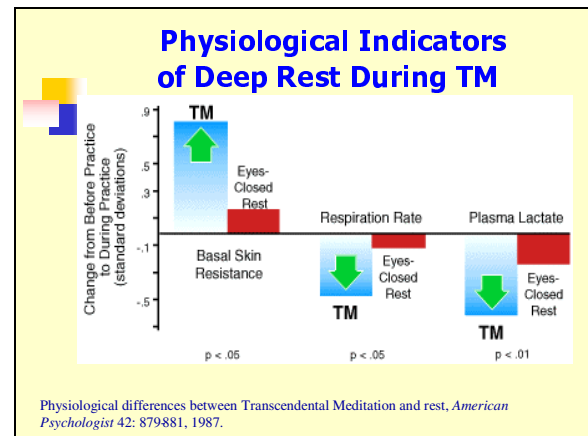


Figure 1: Physiologic changes in basal skin resistance, respiration rate, and plasma lactate levels. Dillbeck MC, Orme-Johnson DW. Physiological differences between Transcendental Meditation and rest. *American Psychologist*. 1987; 42: 879-881.

PHYSIOLOGICAL CHANGES DURING TRANSCENDENTAL MEDITATION

Physiological research has shown that Transcendental Meditation gives rise to a unique state of deep rest, characterized by marked reductions in metabolic activity [3-13]; increased orderliness and integration of brain functioning [14-27]; decreased peripheral vascular resistance [166]; increased cerebral blood flow [6, 28, 29]; and features directly opposite to the physiological and biochemical effects of stress, including skin resistance changes [3, 8, 30, 31], reductions in plasma cortisol [32-35], arterial blood lactate [3, 6, 7, 11, 30], and muscle tone [15,

36]. Several other neuroendocrine changes have also been observed during Transcendental Meditation [31, 37-44]. Taken together, these studies clearly distinguish the physiology of Transcendental Meditation as distinctly different from sleep or simple relaxation [13, 30] (see Figure 1).

PRIMARY PREVENTION

One of the most important health benefits of Transcendental Meditation is primary prevention of illness. In evaluating the effects on overall health, research has examined health-care utilization over five consecutive years among 2,000 health insurance subscribers practicing Transcendental Meditation, as compared to norm and control groups matched by age, gender, occupation, and health insurance terms (drawn from a total sample of 600,000) [2]. Over the five-year period, the Transcendental Meditation participants consistently had fewer than half the number of doctor visits and days in hospital compared to norms and control. Additionally, the Transcendental Meditation group showed relatively little increase in need for health care with increasing age as would usually be expected and in contrast to the trend seen in controls.

Rates of hospital admission for medical and surgical conditions were 60-70% lower in the Transcendental Meditation group, with reductions in all 17 disease categories studied. For example, hospital admissions were 87% less for diseases of the heart and blood vessels, 55% less for tumors, 73% less for respiratory disorders, 87% less for neurological problems, and 30% less for infections (see Figure 2).

More recently, an eleven-year study of Blue Cross/Blue Shield data analyzed medical utilization patterns of individuals practicing Transcendental Meditation and other aspects of Maharishi Vedic Medicine. Significant

reductions in medical care utilization were found compared with normative data and matched control groups. Overall medical expenditure was 59% lower than norms, with 80% fewer hospital admissions and 55% fewer out-patient visits to the doctor. Those over the age of 45 had 88% fewer hospital days than controls. Analysis by disease categories showed that hospital admission rates were 92% lower for immune, endocrine, and metabolic disorders; 92% lower for cardiovascular disease; 92% lower for mental health and substance abuse, and 94% lower for musculoskeletal disorders [46].

Other studies have reported decreased need for medication among those who practice the Transcendental Meditation technique, including reduced use of mild analgesics, sleeping tablets, tranquilizers, anti-depressants, anti-histamines, asthma inhalers, anti-hypertensives, and drugs for heart disease [47-51].

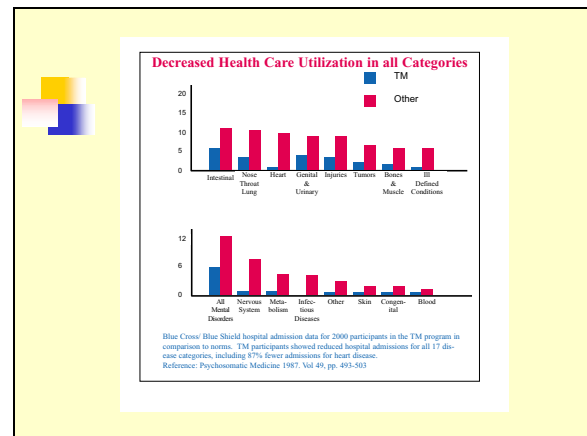


Figure 2: Blue Cross Blue Shield hospital admission data for 2,000 participants in the TM program compared to a normative group. TM participants showed reduced hospital admissions for all 17 disease categories studied, including 87% reduction in admissions related to heart disease. Orme-Johnson DW. Medical care utilization and the Transcendental Meditation program. *Psychosomatic Medicine*, 1987;49:493-507.

REDUCTION OF MAJOR RISK FACTORS FOR DISEASE

Reduced requirements for health care are consistent with research showing that TM reduces a variety of important risk factors for disease. These findings include reductions in high blood pressure [52-61]; cholesterol levels [55, 62]; cigarette smoking, alcohol consumption, and drug abuse [47, 63-67]; obesity [68]; cardiovascular reactivity to stress [69]; physiological and psychological stress levels [30, 70-74]; and anxiety, depression, and hostility [65, 71, 75-77]. Transcendental Meditation also enhances potential protective factors such as job satisfaction [72, 78] and overall psychological health and well-being [79].

REDUCTION IN HIGH BLOOD PRESSURE AND CARDIOVASCULAR RISK

Hypertension is a primary risk factor for cardiovascular disease, the single greatest cause of mortality in the United States. A number of studies have shown that the practice of Transcendental Meditation leads to clinically beneficial reductions in blood pressure [53-58, 60, 61]. TM produces reductions in systolic and diastolic blood pressure comparable to those commonly found with anti-hypertensive medication, but without any adverse side effects [60].

Randomized controlled trials have found that Transcendental Meditation is significantly more effective in reducing mild hypertension than the "usual care" program of advice on weight loss, salt restriction, exercise, and reduced alcohol intake. It also proved more effective than other techniques, including progressive muscular relaxation, a pseudo-meditation procedure [57, 60, 61] (see Figure 3).

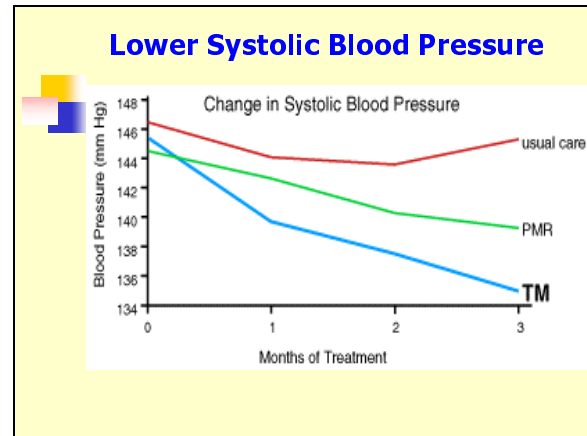


Figure 3: Subjects with hypertension were randomly assigned to TM, progressive muscle relaxation, and usual care groups. The TM group showed a 11/6 mmHg decline in systolic and diastolic blood pressure, significantly greater reductions than in the other groups. Schneider RH, Staggers F, Alexander CN, Sheppard W, Rainforth M, Kondwani K, Smith S, King CG. A randomized controlled trial of stress reduction for hypertension in older African Americans. *Hypertension*, 1995; 26: 820-827.

Further analysis showed that Transcendental Meditation produced significant reductions in systolic and diastolic blood pressure for men and women in both high- and low-risk groups on six measures of hypertension risk: psychosocial stress, obesity, alcohol use, physical inactivity, dietary sodium-potassium ratio, and a composite measure of these risk factors [61].

Non-pharmacological methods are now recognized as crucial to therapy for hypertension, especially in patients under 60 years. For example, the Joint National Committee on the Detection, Evaluation, and Treatment of High Blood Pressure has recommended that non-pharmacological, behavioral approaches "should be used both as definitive intervention and as an adjunct to pharmacologic therapy and should be considered for all anti-hypertensive therapy" [80].

A review of research on behavioral therapy for hypertension [58] concluded that Transcendental Meditation provides an optimal non-pharmacological treatment and preventive program for high blood pressure because the technique:

- produces rapid, clinically significant blood pressure reductions,
- is distinctly more effective than other meditation and relaxation procedures,
- is continued by a high proportion of subjects (in contrast to lower continuation rates for relaxation techniques and the frequent problem of poor compliance with anti-hypertensive drugs),
- has documented acceptability and effectiveness in a wide range of populations,
- is effective in reducing high blood pressure both when used as sole treatment and when used in concert with medication,
- reduces high blood pressure in "real life" environments outside the clinic,
- is free from harmful side-effects or adverse reactions,
- also reduces other cardiovascular risk factors and improves health in a general way.

Furthermore, the cost-effectiveness of Transcendental Meditation has been found to compare favorably with medication in the management of mild hypertension [81].

REVERSAL OF ATHEROSCLEROSIS

A randomized, controlled clinical trial with hypertensive African Americans found that practice of the Transcendental Meditation technique over 6-9 months led to a significant decrease in carotid artery atherosclerosis, assessed by ultrasound measurement of intima-media thickness. A control group who received health education showed an increase in atherosclerosis [167].

This landmark study showed a reversal of the progression of cardiovascular disease, demonstrating an 11% decrease in the risk of heart attack, and a 7.5 -15% reduction in the risk of stroke. This is the first controlled study to suggest that stress reduction by itself can reduce atherosclerosis, without changes in diet or exercise.

BENEFITS FOR MENTAL HEALTH

A large body of research has demonstrated that Transcendental Meditation produces comprehensive improvements in mental health, enhancing positive features, and reducing various forms of psychological distress [48, 49, 65, 71, 72, 74-79, 82-104].

A systematic review of 146 studies found that Transcendental Meditation was markedly more effective in reducing anxiety than other techniques (including progressive muscular relaxation, methods purported to induce a "relaxation response", and other forms of meditation) [76]. The greater effectiveness of Transcendental Meditation remained highly significant when only the strongest and most rigorous studies were included in the analysis. Transcendental Meditation has also consistently been found to reduce depression, hostility, and emotional instability, indicating the growth of a more stable, balanced, and resilient personality [65, 71, 74, 75, 77, 82, 86, 87, 92, 101].

In another meta-analysis of 42 independent research results, Transcendental Meditation was found to be three times as effective as other meditation and relaxation procedures in increasing self-actualization, an overall measure of positive mental health and personal development. Further analysis revealed that the technique is exceptionally effective in developing three independent components of this dimension: emotional maturity, a resilient sense of self, and a posi-

tive, integrated perspective of self and the world [79].

An exhaustive survey conducted by the Swedish National Health Board found evidence that psychiatric hospital admissions may be much less common among people practicing Transcendental Meditation than in the general population [95].

The comprehensive nature of Transcendental Meditation's benefits for mental health has been illustrated in a randomized study of Vietnam War veterans suffering from post-traumatic stress disorder, a debilitating syndrome that is often difficult to treat [71]. Over a three-month period, patients practicing Transcendental Meditation showed clear-cut improvements in all aspects of the syndrome studied, with significant decreases in depression, anxiety, insomnia, and alcohol consumption; improvement in family problems; reduced severity of delayed stress syndrome and less emotional numbness; as well as greater ease in obtaining a job. In contrast, the control group who received standard treatment with psychotherapy showed no significant change on any measure.

REDUCED USE OF CIGARETTES, ALCOHOL, AND NON-PRESCRIBED DRUGS

Transcendental Meditation has consistently been found to reduce the use of tobacco, alcohol, and non-prescription drugs [47, 48, 63-66, 71, 72, 96, 97, 105-120]. A meta-analysis of 19 studies found that Transcendental Meditation produced substantial and highly significant reductions in smoking, alcohol consumption, and illicit drug use, with larger effects than other treatments, including standard therapies and other techniques of meditation and relaxation [64]. Over an 18-24 month period, abstinence from cigarettes ranged from 51% to 89% for

practitioners of Transcendental Meditation, compared to 21% for good conventional substance abuse programs (see Figure 4).

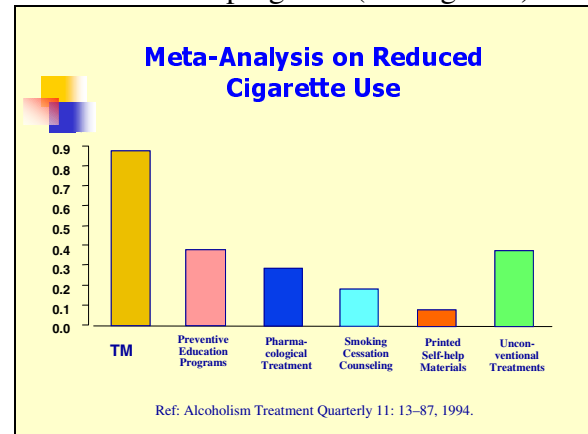


Figure 4: Meta-analysis showing greater effectiveness of TM program compared to other commonly used approaches to smoking cessation. Alexander CN, Robinson P, Rainforth M. Treating and preventing alcohol, nicotine, and drug abuse through Transcendental Meditation: A review and statistical meta-analysis. *Alcoholism Treatment Quarterly*, 1994;11: 1-2, 13-87.

MANAGEMENT OF COMMON DISORDERS

Based on research and clinical experience, a number of authors have examined the role of Transcendental Meditation in the management of common clinical problems, including risk factors for disease, mild hypertension, stress-related disorders, migraine headaches, anxiety, mild depression, and substance misuse. Studies have explored TM's contribution to the promotion of positive health and well-being, and the enhancement of quality of life for patients with serious disorders [49, 52, 58, 64-66, 75, 97, 113-130].

In a controlled study of asthma patients, TM was found to improve airway resistance and to reduce severity of symptoms (as evaluated by both patients and physicians) [124].

Another controlled study examined the effect of Transcendental Meditation on exercise tolerance in patients with angina pectoris. All patients in this study had proven coronary artery disease, mostly of moderate or severe degree, and positive exercise-stress tests. Over an eight-month period, subjects who practiced Transcendental Meditation showed significant improvements in exercise tolerance and maximum workload achieved during a standard exercise test. In addition, there was a significant delay in the onset of electrocardiographic evidence of myocardial ischemia during exercise [125].

A recent pilot study found significant positive effects of Transcendental Meditation on objective exercise test variables and quality of life in patients with cardiac syndrome X (anginal chest pain, positive response to exercise stress testing, and normal coronary angiogram). Despite a generally good prognosis, this distressing and disabling condition, often necessitates expensive and invasive investigations, and recurrent hospital admissions; drug treatment is frequently unsatisfactory [168].

A number of studies have reported reduced insomnia and improved quality of sleep as a result of Transcendental Meditation [48, 67, 71, 72, 77, 101]. There is also evidence that subjects practicing this technique have better periodontal health [131].

REVERSAL OF THE DELETERIOUS EFFECTS OF THE AGING PROCESS

It has been noted that many effects of Transcendental Meditation are opposite to deterioration usually seen with aging [1, 57, 135, 148-151]. Other findings indicate a strengthening of factors known to favor longevity and good health in later life (e.g., cardiovascular health, work satisfaction, positive health habits, mental health, happiness, and intelligence) [57, 148].

In keeping with these observations, a study employing a standardized aging index found that the biological age of middle-aged individuals practicing Transcendental Meditation was significantly younger than both their chronological age and the biological age of non-meditating control subjects. The longer subjects had been practicing Transcendental Meditation, the greater the degree to which biological age was younger than chronological age [148].

As discussed above, a randomized controlled study on elderly subjects found that Transcendental Meditation led to improvements in mental and physical health and well-being, cognitive and perceptual abilities, and longevity [57].

Compared to controls, middle-aged and older individuals practicing Transcendental Meditation have been found to maintain higher levels of dehydroepiandrosterone sulfate (DHEAS), a hormone that declines steadily throughout adult life. Low levels of DHEAS have been linked to a variety of diseases and to increased mortality. On average, DHEAS levels in individuals practicing Transcendental Meditation were comparable to levels of non-meditators who were 5-10 years younger—a difference that could not be explained by variations in diet, weight, or exercise habits [150].

Subjects practicing Transcendental Meditation have also been found to have lower average erythrocyte sedimentation rate (ESR) and a higher frequency of zero ESR compared to controls. Increased ESR correlates with aging and is a well-established indicator of disease [151].

Increased need for health care and the costs related to it are among the most important correlates of aging. As previously dis-

cussed, a study of health insurance data found relatively little increase in health care needs with advancing age among individuals practicing Transcendental Meditation, in contrast to a marked increase seen in a normative control group [2, 46].

REDUCING MEDICAL EXPENDITURE

Transcendental Meditation has also been shown to have a direct effect on reducing medical expenditure. As mentioned earlier, Transcendental Meditation has been found to be more cost-effective than medication in treating mild hypertension [81] (see Figure 5).

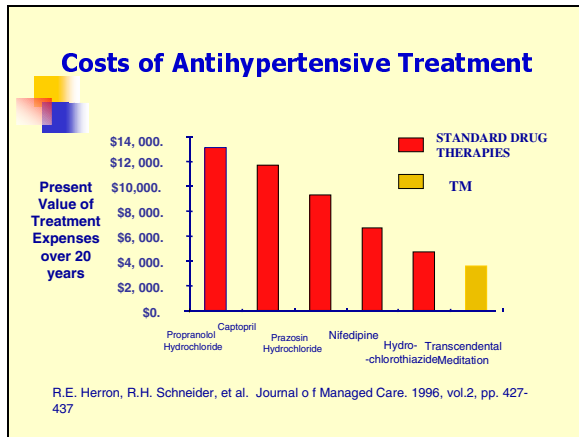


Figure 5: A cost-effectiveness comparison in 1996 dollars was conducted among five standard anti-hypertensive medications and the TM technique over a simulated 20-year treatment period. TM was significantly more cost-effective. Herron RE, Schneider RH, Mandarino GV, Alexander CN, Walton KG. Cost-effective hypertension management: comparison of drug therapies with an alternative program. *American Journal of Managed Care*, 1996, 2:427-437.

A retrospective controlled study of 2836 enrollees of the Quebec provincial health insurance program examined medical expenses over 14 years. Monthly data on payments to physicians were adjusted to account for aging, inflation, and other influ-

ences, using normative data provided by the Quebec government. Before beginning Transcendental Meditation, the TM group did not differ significantly from the control group in terms of payments to physicians. However, for the TM group, after learning Transcendental Meditation, mean payments declined by 1 to 2% each year over six years, while the control group's mean payments increased by nearly 12% annually. This resulted in a mean annual difference between the two groups was over 13%. Cumulatively, after 6 years, payments to physicians were 55% lower for subjects practising Transcendental Meditation compared to controls [169] (see Figure 6).

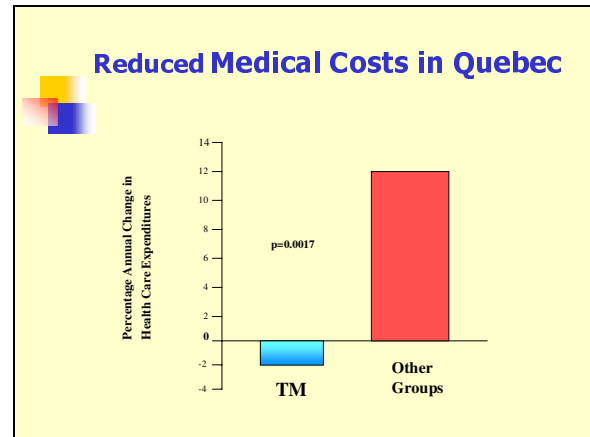


Figure 6: A retrospective study of Quebec health insurance enrollees over a 14-year showed mean decline of 1-2% per year in payments for physicians and treatment in the TM group, compared to a 11.73% increase annually in the control group. This resulted in a mean annual difference between the two groups of 13.78%. Herron R, Hillis S. The impact of the Transcendental Meditation program on government payments to physicians in Quebec: an update. *American Journal of Health Promotion*. 2000; 14(5):284-291.

These results extend the findings of an earlier Canadian study showing a reduction of 5-7% annually as a result of the practice of Transcendental Meditation [45].

These outcomes are supported by research showing a 57% reduction in medical expenditure in subjects practicing Transcendental Meditation and other aspects Maharishi's Vedic Approach to Health [46].

OCCUPATIONAL HEALTH AND JOB SATISFACTION

Transcendental Meditation can also be valuable for occupational health and performance [67, 72, 74, 78, 152]. One study examined stress, health, and employee development in two settings in the automotive industry: a large manufacturing plant of a Fortune 100 corporation and a small sales distribution company. Employees who learned Transcendental Meditation showed significantly greater improvement than matched control subjects on a wide variety of measures, including, reduced physiological arousal; decreases in anxiety, job tension, insomnia and fatigue; reduced consumption of cigarettes and alcohol; and improved general health [72]. Practice of Transcendental Meditation also led to increased job satisfaction, improved employee effectiveness, and better relationships, confirming the findings of earlier studies [78].

In a five-month study conducted by researchers from Japan's National Institute of Industrial Health (a branch of the Japanese Ministry of Labor), industrial employees practicing Transcendental Meditation showed increased emotional stability, reduced anxiety, decreased tendency to neurosis, reduced impulsiveness, decreased physical complaints, and reduced insomnia and smoking compared to controls. Depression was also reduced in the Transcendental Meditation group, despite lower initial levels [67, 74]. Overall, employees practicing Transcendental Meditation improved significantly on 10 out of 14 mental health scales, whereas controls improved on only one [74].

Development of a company's human resources through Transcendental Meditation has been shown to produce marked improvements in corporate health and performance. For example, in a medium-sized chemical manufacturing company, productivity and profitability increased steadily as the number of employees practicing Transcendental Meditation rose over a six-year period to 80% of the total workforce. Over this time period productivity increased by 52%, annual sales per employee grew by 88%, while days lost through illness or injury decreased by 50% and absenteeism declined by 89% [152].

REHABILITATION OF CRIMINAL OFFENDERS

Transcendental Meditation has also been effective in the rehabilitation of criminal offenders. Studies in several penal institutions including maximum security prisons, have shown a wide variety of improvements in mental health and behavior in prison inmates, and substantially reduced rates of recidivism [77, 101-104].

TRANSCENDENTAL MEDITATION AND OTHER TECHNIQUES

Transcendental Meditation is unique in the range and depth of research into its effects. Controlled studies comparing TM with various other methods of relaxation or meditation have demonstrated the distinct effectiveness of the technique in promoting deep physiological rest, reducing stress, decreasing mild high blood pressure, improving mental health, and enhancing perceptual-motor performance [9, 24, 30, 57, 58, 76, 79, 91, 92, 132].

As mentioned, meta-analyses have shown that Transcendental Meditation is markedly more effective than relaxation techniques and other forms of meditation in reducing anxiety, improving overall psychological

health, and reducing substance abuse [64, 76, 79].

A meticulously controlled, randomized study conducted at Harvard University found that elderly individuals who learned Transcendental Meditation showed significantly greater improvements in a variety of age-related aspects of mental and physical health and well-being than subjects taught other techniques or those in a no-treatment control group. In particular, those who learned a relaxation procedure that attempted to imitate Transcendental Meditation showed no improvement on any measure. A clear majority of subjects practicing Transcendental Meditation rated their technique as personally useful and easy to practice, in contrast to lower rates for the other techniques. Most strikingly, after three years, all those who had learned Transcendental Meditation were still living, in contrast to significantly lower survival rates for the other three groups and for the remaining inhabitants of the institutions where the study was conducted [57]. Significantly greater longevity in the TM group was subsequently found to be maintained over a 15-year followup period [170].

POSITIVE HEALTH

The effects of Transcendental Meditation extend beyond prevention and treatment, to the promotion of health. This development is illustrated by studies showing increased creativity and intelligence [86, 133-135]; improvements in perceptual acuity [136-140], mind-body coordination [132, 141, 142], and spinal reflex efficiency [143, 144]; improvements in academic performance, greater moral maturity, increased orientation towards positive values, and growth of social maturity in college students [98, 145-147]; better relationships at work [72, 78]; and increased marital satisfaction and adjustment [94]. On many levels, TM contrib-

utes to physical, psychosocial, and behavioral health and well-being.

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