



Education

Éducation

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## Wellness programs: a review of the evidence

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### Abstract

**Objective:** To review studies that have examined an association between wellness programs and improvements in quality of life and to assess the strength of the scientific evidence.

**Data sources:** A MEDLINE search was constructed with the following medical subject headings: "psychoneuroimmunology," "chronic disease" and "health promotion," "chronic disease" and "health behaviour," "relaxation techniques," "music therapy," "laughter," "anger," "meditation" and "behavioural medicine." Searches using the text words "wellness" and "wellness program" were also carried out. References from the primary articles identified in the search and contemporary writing on wellness were also considered.

**Study selection:** Selection was limited to randomized controlled trials or prospective studies published in English that involved human subjects and that took place between 1980 and 1996. All studies with an intervention aimed at promoting wellness and measuring outcomes were included, except studies of patients with cancer and HIV and studies of health promotion programs in the workplace. Of the 1082 references initially identified, 11 met the criteria for inclusion in the critical appraisal.

**Data extraction:** The following information was extracted from the 11 studies: characteristics of the study population, number of participants (and number followed to completion), length of follow-up, type of intervention, outcome measures and results. All 11 studies were assessed for the quality of their evidence.

**Data synthesis:** All studies reported some positive outcomes following the intervention in question, although many had limitations precluding applicability of the results to a wider population.

**Conclusions:** Despite the suggested benefit associated with wellness programs, the evidence was inconclusive. Whether the composition of the target group or the type of intervention has a role in determining outcomes is unknown. Although trends suggest that wellness programs may be cost-effective, further research is needed for confirmation.

### Résumé

**Objectif :** Revoir les études au cours desquelles on a cherché à établir s'il y avait un lien entre les programmes de mieux-être et des améliorations de la qualité de vie, et évaluer la solidité des données probantes scientifiques.

**Sources de données :** On a créé une recherche dans le MEDLINE en utilisant les vedettes-matière médicales suivantes : «psychoneuroimmunology», «chronic disease» et «health promotion», «chronic disease» et «health behaviour», «relaxation techniques», «music therapy», «laughter», «anger», «meditation» et «behavioral medicine». On a aussi effectué des recherches en utilisant les expressions «wellness» et «wellness program», et tenu compte de références tirées des articles primaires repérés au cours de la recherche et d'écrits contemporains sur le mieux-être.

**Sélection d'études :** La sélection a été limitée aux études contrôlées et randomisées ou aux études prospectives publiées en anglais, qui portaient sur des sujets humains et ont eu lieu entre 1980 et 1996. On a inclus toutes les études comportant une intervention qui visait à promouvoir le mieux-être et à mesurer les résultats, sauf les études portant sur les patients atteints du cancer et du VIH et les études portant sur des programmes de promotion de la santé au travail. Sur les



1 082 références repérées au début, 11 satisfaisaient aux critères d'inclusion dans l'évaluation critique.

**Extraction des données :** On a extrait les renseignements suivants des 11 études : caractéristiques de la population de l'étude, nombre de participants (et nombre de participants suivis jusqu'à la fin), durée du suivi, type d'intervention, mesures de résultats et résultats. On a évalué la qualité des données probantes tirées des 11 études.

**Synthèse des données :** Toutes les études ont signalé des résultats positifs après l'intervention en question, même si beaucoup comportaient des limites qui empêchaient d'appliquer les résultats à une population plus étendue.

**Conclusions :** En dépit de l'avantage indiqué associé aux programmes de mieux-être, les preuves n'étaient pas concluantes. On ne sait pas si la composition du groupe cible ou le type d'intervention a un rôle à jouer dans la détermination des résultats. Même si les tendances indiquent que les programmes de mieux-être peuvent être rentables, il faut effectuer d'autres recherches pour le confirmer.

The concepts "wellness" and "holistic health" have become popular in the last 2 decades. In fact, it is possible that alternative medicine and nonconventional interventions are sought by 1 in 3 adults in North America.<sup>1</sup> Our review was conducted to investigate the scientific evidence for wellness programs and to determine whether further research is warranted. We examined the strength of the evidence supporting wellness interventions and attempted to answer the question, "Are wellness programs worthwhile?" This question addresses not only the efficacy of such programs, but also the issue of whether the health care system should choose to promote and fund them.

Wellness is a concept often emphasized by alternative or complementary medical systems, where it is viewed as distinct from the concepts of prevention and treatment of disease. Ardell (quoted by Conrad<sup>2</sup>) has defined wellness as "a conscious and deliberate approach to an advanced state of physical and psychological/spiritual health." Micozzi<sup>3</sup> described wellness as "a focus on engaging the inner resources of each individual as an active and conscious participant in the maintenance of his or her own health."

For the purposes of this review, we define a wellness program as a structured intervention focused on achieving wellness in the physical, psychological or spiritual realm. Such programs share the goal of encouraging self-care and are purported to help patients recover some control over their health and health care. They represent adjunctive treatment to conventional interventions. Wellness programs are usually aimed at patients with chronic illnesses. The desired outcome is an improvement in the patient's quality of life, which is considered a global measure of health or well-being based on perceptions, illness experience and functional status. Wellness incorporates sociocultural, psychological and disease-related factors.<sup>4</sup>

We propose a potential role for wellness programs in the health care system for several reasons. First, wellness

programs may be an effective way of improving the treatment of chronic illness. Second, it appears that the public perceives a need for more than what conventional medicine has to offer. Self-help books and videos and "alternative" therapies are widely used.<sup>1,5,6</sup> Surveys in Britain suggest a growth in the number of "alternative" practitioners of 10% per year.<sup>7</sup> If the needs of the public are changing, wellness programs may provide a means of responding to these needs within the framework of the health care system. Finally, wellness programs may be compatible with the fiscal constraints of today's health care delivery system. They use a patient-centred, multidisciplinary approach and may shift service from institutions to the community and from physicians to allied health professionals. They may reduce health service usage, decrease the number of physician visits and contribute to preventive health care.

## Background

The principles of wellness promotion are based on subjective evidence and supported by research in the areas of psychology, psychoneuroimmunology and behavioural medicine. Although these principles may be rooted in ancient Eastern traditions, many of the beliefs and practices in wellness promotion arise from the work of popular contemporary writers such as Herbert Benson and Bernie Seigel. Perceived benefits associated with these practices are based primarily on the reported experiences of participants and advocates of the wellness ideology. The subjective nature of this evidence limits its value in determining the usefulness of wellness programs.

Recent research has added a greater degree of validity to this "soft" evidence. One area of research, psychoneuroimmunology, examines mind-body interactions at the cellular level. This research has shown relations between psychological factors and the neural, immune and endocrine systems.<sup>8</sup> Techniques such as biofeedback, relax-



ation, guided imagery and exercise increase indicators of the robustness of the immune system.<sup>9-11</sup> Similarly, the induction of mood states in actors enhances the capabilities of the immune, neural and endocrine systems.<sup>12</sup> High levels of stress are associated with suppression of the immune system.<sup>13,14</sup> All of these findings provide evidence that the mind and the body communicate. However, from the physiological changes observed, no conclusions can be drawn about the effect of psychological factors on disease progression, outcome or quality of life.

Researchers in behavioural medicine have attempted to demonstrate the relation between psychological factors and disease symptoms. Goodale and coworkers<sup>15</sup> found that relaxation training is an effective treatment for premenstrual syndrome. Houtman and colleagues<sup>16</sup> reported that work stress was related to both psychosomatic complaints and musculoskeletal problems. A third study<sup>17</sup> determined that anger suppression and expression had a direct influence on depression. Unfortunately, studies in this area are few and often poorly designed.

## Methods and data sources

To locate studies for review, we searched the MEDLINE database for the period 1980 to 1996 using the medical subject headings "psychoneuroimmunology," "chronic disease" and "health promotion," "chronic disease" and "health behaviour," "relaxation techniques," "music therapy," "laughter," "anger," "meditation" and "behavioural medicine." These subject headings were chosen because many studies of interventions aimed at wellness as we have defined it do not use the term "wellness." These headings represent general areas of research where wellness is applied, such as behavioural medicine, and common components of wellness programs, such as relaxation techniques. Searches were also conducted using the text terms "wellness" and "wellness program." The terms "cancer," "HIV" and "AIDS" were not used, as we were primarily interested in non-terminal diseases and the patient populations predominantly encountered in primary care. The search using "psychoneuroimmunology" as a subject heading was restricted to the period 1992 to 1996, because this is a relatively new area of study. We used this topic as a means of accessing scientific background to wellness programming. All searches were limited to studies on humans and those written in English.

Other databases, such as those devoted to the social sciences, were not searched. We believed that the focus of the review should be on resources that would normally be sought by primary care physicians and that could be evaluated in that context. In addition to the MEDLINE search, we examined some popular publications in the

area of wellness and mind-body health for further references.<sup>18,19</sup> References from primary articles identified in the search were also examined, but none were included in the final analysis.

Initially 1082 references were retrieved. To be included in this review, the publication had to be a primary study of a randomized controlled trial or a prospective study involving an intervention aimed at improving wellness and valid outcome measures. Most of the references were excluded because they were editorials, opinion articles or descriptive studies of the impact of illness on quality of life. Many references were discarded because they did not address any type of intervention or because they were evaluations of the reliability of particular instruments that measure quality of life. Studies of chronic psychiatric disorders and diseases, such as cancer and AIDS, were excluded, as were studies of health promotion programs in the workplace that used productivity as the outcome measure. We also excluded studies of programs aimed at specific, unrelated groups such as medical or nursing students, since these populations were not relevant to our objectives. Because survival times were not the desired outcome for our review, studies that primarily measured this outcome were excluded.

## Data extraction

Of the 1082 articles, 11 met all of our criteria. The data extracted from these studies were a description of the subject population, the number of subjects and the number who were followed to the end of the study, the duration of follow-up, the type of intervention, the outcome measures, the methods of analysis and the results, including if possible the clinical or statistical significance with confidence intervals. Each study was then assessed for the quality of its evidence on the basis of overall study design and the significance of the results.

Our assessment of the quality of the evidence was based on the system used by the Canadian Task Force on the Periodic Health Examination.<sup>20</sup> This system ranks evidence from levels I to III, where level I applies to randomized controlled trials (RCTs), level II-1 to controlled trials without randomization, level II-2 to well-designed cohort or case-control studies, level II-3 to uncontrolled studies and level III to case studies or descriptive studies.

For our critical appraisal of the studies, we followed the guidelines of Sackett and associates.<sup>21</sup> For the purposes of this review, we defined a valid outcome measure as one including validated inventories of quality of life, validated measures of psychological variables including mood, self-esteem, functional status, anxiety, life satisfaction, happiness, subjective well-being, coping strategies, locus of control and measures of self-reported symptomatology.



## Results

Although 22 of the original 1082 studies were initially identified, 11 were discarded because they were descriptions or individual case studies or involved patients with cancer or HIV.

A fundamental difficulty associated with reviewing and comparing research in this area is the high degree of variability of interventions, target populations and outcome measures. In the 11 studies we reviewed,<sup>22-32</sup> the interventions ranged from distant prayer and spiritual healing to structured, educational programs (Table 1). Some interventions were conducted individually, some in a group, and some studies used both settings. The common interventions are not standardized. For example, meditation training may vary in both content and delivery.

The target groups ranged from those with a common diagnosis to people with multiple diagnoses to healthy people. Some target groups were volunteers, others were recruited. The outcome measures also differed. Some of the studies used some measure of psychological variables or quality of life, whereas others included measures of physical health or fitness or medical diagnoses.

The inconsistent quality of the study designs also made comparison difficult. Of the 7 RCTs providing level I evidence, only 2 had sample sizes greater than 100;<sup>23,28</sup> 1 RCT had only 30 patients.<sup>24</sup> Only 1 study was double-blinded<sup>28</sup> and 1 was investigator-blinded;<sup>24</sup> hence investigator and subject bias was an issue in the others. The 4 studies yielding level II evidence all used a before-and-after design.<sup>29-32</sup> Of these, only 1 had an equivalent control group,<sup>29</sup> and in 2 of these studies,<sup>29,30</sup> the sample size was less than 50.

All studies yielded evidence to support the use of the intervention in question; the results were usually statistically or clinically significant but inconclusive because of small sample size or methodological bias. In general, the interventions resulted in improved scores on one or several psychological scales, such as measures of mood, anxiety, self-esteem and coping skills. The studies that did not directly measure quality of life implied an improvement based on other scales. All of the studies used predominantly validated scales to measure outcomes, such as the profile of mood states<sup>33</sup> and state-trait inventories.<sup>34</sup> All of the studies reported high levels of significance ( $p < 0.01$ ).

Several studies found that an intervention was more effective for a particular population. Women far outnumbered men in all studies except 2 that involved healthy volunteers,<sup>23,26</sup> and men were predominant in the study on intercessory prayer.<sup>28</sup> Hanser and Thompson<sup>24</sup> found that predominantly highly educated females benefited the most. The role of expectation and the placebo effect affected outcomes. In his study of the effects of spiritual

healing on illness, Wirth<sup>30</sup> found a significant relation between high patient and healer expectation and the effectiveness of the intervention.

The 7 well-designed RCTs all pointed to positive effects of wellness-oriented interventions.<sup>22-28</sup> Three of these<sup>23,25,26</sup> dealt specifically with healthy volunteers, and their results may not be applicable to other people, such as frequent clinic attenders or those with chronic pain. However, Sharpe and colleagues' study<sup>22</sup> of chronic fatigue syndrome showed significant implications for the use of cognitive behaviour therapy, and Hellman and associates<sup>27</sup> demonstrated significant cost savings associated with their interventions in a population of frequent attenders at the Harvard Community Health Clinic. The study with the strongest evidence looked at the effects of distant prayer, the least "scientific" of the interventions.<sup>28</sup>

## Discussion

The results of the studies support the use of wellness interventions, but the evidence is inconclusive. In many studies controls were lacking or not described, which made the interpretation of results difficult. Self-selection, as opposed to random assignment, was frequently the method used to assign subjects to groups. One could argue that this creates bias in the results by favouring the intervention and that the control group in these studies was not equivalent to the study group. The issue of nonequivalent controls is a problem in studies where the control group consists of drop-outs or noncompliant participants. In such cases, a comparison to determine efficacy is made between those best suited for the program and those least suited. Drop-out rates were mentioned in most of the studies that we reviewed, but noncompliant subjects were not accounted for in the follow-up results.

Perhaps the most profound limitation in these studies was their inability to control for confounding variables. In an examination of subjective outcomes and psychological mechanisms, it is difficult to know what variables are contributing to a response and how to control for them. For example, many studies measure happiness, anger, mood, coping ability or fatigue — all of which are influenced by other variables that cannot be controlled.

The published research that we reviewed provides some evidence that wellness interventions are related to improvements in quality of life. However, the efficacy of specific interventions was not compared. What this research does suggest is that psychological interventions and the involvement of a patient in his or her own care have positive effects on the person's illness and life. However, further RCTs are needed to improve our understanding of wellness programs and to establish the limitations of such programs due to possible inherent biases.



**Table 1: Characteristics of 11 selected studies of wellness interventions**

Study	Patient population	Intervention and follow-up	Outcome measures	Results	Quality of evidence <sup>26</sup>	Comments
Sharpe et al 1996 <sup>22</sup>	60 patients with chronic fatigue syndrome (59 completed the study)	Medical care v. cognitive behaviour therapy plus medical care 12-mo follow-up	1. Patient functioning assessed by interviews and Kamoisky scale 2. Symptoms on patient-rated scales (Likert-type) 3. Overall change on a 7-point patient-rated scale 4. Illness beliefs and coping behaviours on 7-point and 5-point Likert-type scales respectively	<ul style="list-style-type: none"> <li>Significantly improved functioning (physical and psychological symptoms except anxiety); 73% study group v. 27% control group (<math>p &lt; 0.001</math>)</li> <li>Reduction in beliefs and coping behaviours associated with poor outcome (<math>p &lt; 0.05</math>)</li> </ul>	Level 1; RCT	Patients randomly assigned; well-designed study; suggests that cognitive behaviour therapy is better than medical therapy alone
Brown et al 1995 <sup>23</sup>	163 healthy sedentary adults (135 completed the study)	1. Walking at various intensities 2. Walking plus relaxation response 3. Walking plus mindful exercise (tai chi) 16-wk follow-up	1. Mood: state-trait anxiety inventory, state-trait anger inventory, positive-negative affect scales, profile of mood states 2. Self-esteem: Rosenberg self-esteem scale, Sanstream physical estimation scale, body cathexis scale 3. Life satisfaction: life satisfaction scale, neuroticism, extraversion and openness-personality inventory	Women in the mindful exercise group achieved a significantly greater reduction in anger and total mood disturbance and overall improvement in general mood ( $p < 0.0408$ )	Level 1; RCT	Focus was on physiological adaptations in healthy sedentary adults so results may not apply to those with chronic illnesses; large number of physiological variables assessed; positive findings may have been influenced by self-selection bias, as drop-out rates differed among groups
Hanser and Thompson 1994 <sup>24</sup>	30 older adults with affective disorders (28 completed the study)	Music therapy 9-mo follow-up	1. Geriatric depression score 2. General severity index 3. Self-esteem inventory 4. Profile of mood states	Significant improvements on all measures were maintained at 9-mo follow-up ( $p < 0.05$ )	Level 1; RCT	Small sample of older adults with existing affective disorders; results support the use of music therapy and indicated that it may be cost effective; group was predominantly female and highly educated
Dua and Swinden 1992 <sup>25</sup>	32 healthy university students (29 completed the study)	1. Negative thought reduction training 2. Meditation training 3. Placebo for very angry subjects 4. No treatment 6-wk follow-up	1. Spielberger state-trait anger scale 2. Novaco's anger inventory 3. Novaco's behaviour and coping strategy scale interviews	Improvements in all groups; anger reduction greater in negative thought reduction and meditation groups than in placebo and non-treatment groups ( $p < 0.01$ )	Level 1; RCT	Placebo group was controlled for the effect of exposure to anger-producing situations and expectation of therapeutic change; overall health status not measured or followed
Jin 1992 <sup>26</sup>	96 healthy volunteers (all completed the study)	Sessions of mental and emotional stress followed by <ul style="list-style-type: none"> <li>tai chi</li> <li>brisk walking</li> <li>meditation</li> <li>neutral reading</li> </ul> Follow-up after 2 visits	1. Blood pressure 2. Heart rate 3. Urine catecholamines 4. Salivary cortisol 5. Profile of mood states	<ul style="list-style-type: none"> <li>Salivary cortisol levels dropped after all interventions</li> <li>Physiologic changes after tai chi were comparable to those after brisk walking but different from the meditation and neutral reading groups (<math>p &lt; 0.001</math>)</li> </ul>	Level 1; RCT	Healthy subjects limit applicability of results to patients with chronic illnesses; although social contact was controlled for, subjects may have had positive attitude toward tai chi on the basis of previous experience
Hellman et al 1990 <sup>27</sup>	80 primary care patients at HMO (70 completed the study)	1. "Ways-to-wellness" group sessions 2. Mind-body group sessions 3. Stress management information group 6-wk follow-up	1. Medical symptom checklist 2. Bipolar profile of mood states 3. Visits to HMO 6 mo before and 6 mo after presentation	Significant reductions in physical and psychological discomfort in the behavioural medicine groups v. information alone: 42% in information group, 74% in mind-body group and 78% in ways-to-wellness group ( $p < 0.01$ ); significant reduction in visits to HMO in these groups (decrease of 2.36 visits in study group v. 0.39 in control group); 67% decrease overall ( $p < 0.01$ )	Level 1; RCT	Behavioural medicine interventions produced significant results; unclear if decrease in psychological symptoms was related to fewer visits to HMO; study suggested that behavioural medicine interventions may be cost effective in the short term



Byrd 1988 <sup>28</sup>	393 CCU patients (number completing study not stated)	Daily intercessory prayer conducted outside hospital by born-again Christians  Follow-up for length of hospital stay	1. Medical condition graded as good, intermediate or bad 2. Hospital course: development of new conditions or use of new interventions during hospital stay	Significantly lower severity score of hospital course after entry; fewer patients in prayer group required ventilatory support (0% v. 6%), antibiotics (2% v. 9%) and diuretics (3% v. 8%) ( $p < 0.0001$ ); prayer group had an overall better outcome (85%) than control group (73%) ( $p < 0.01$ )	Level I; double-blind RCT	Because patients were not involved in the intervention, its applicability to "self-help" programs is unclear
Smith et al 1995 <sup>29</sup>	36 healthy university undergraduate volunteers (all completed the study)	Meditation plus personal happiness enhancement program (PHEP) v. PHEP alone  6-wk follow-up	1. Happiness measure 2. Psychap inventory 3. State-trait anxiety inventory 4. Beck depression inventory 5. Frequency-of-practice log for meditation	Meditation plus PHEP group had significant improvement in all measures compared with PHEP-only and control groups; PHEP-only group scored better than control group ( $p < 0.05$ )	Level II-1; before and after, controlled	Results suggest that a program to enhance happiness can be improved by adding meditation; limited applicability because study used healthy volunteers and did not control for prior experience with meditation
Wirth 1995 <sup>30</sup>	48 patients with mixed diagnoses such as chronic physical pain and heart disease (23 completed the study)	Laying on of hands by spiritual healer  2-mo follow-up plus survey at 5 yr	1. Mental health index combining anxiety, depression, positive well-being and self-control plus measure of general well-being 2. Health perceptions questionnaire	<ul style="list-style-type: none"> <li>Statistically significant difference between pre- and post-treatment scores for all 14 dependent variables; 89.58% reported improvement due to healer v. 10.42% reporting no improvement (<math>p &lt; 0.05</math>)</li> <li>Statistically significant difference in summary score for patients with high expectations of intervention v. those with low expectations; 24/26 patients with high expectations had complete or significant cure; 15/22 patients with low expectations had no change or only slight improvement (<math>p &lt; 0.05</math>)</li> </ul>	Level II-3; before and after, no control	Not blinded; no cohort; self-selected subjects; significant patient bias; patient expectation was measured and identified as playing a major role in outcomes; 48% follow-up in 5-yr survey; study raised interesting point that patient expectation about an intervention can play important role in healing process
Kaplan et al 1993 <sup>31</sup>	77 outpatients with fibromyalgia (59 completed the study)	Structured group sessions including meditation, education, unstructured discussion and homework  10-wk follow-up	1. Visual analogue scales 2. Medical symptom checklist 3. General severity index 4. Coping strategies questionnaire 5. Fibromyalgia impact questionnaire 6. Fibromyalgia attitude index 7. Overall assessment of outcome questionnaire	<ul style="list-style-type: none"> <li>Clinical significance defined as improvement of at least 25% in 50% of the outcome measures</li> <li>51% (30/59) of patients showed clinically significant improvement (<math>p &lt; 0.01</math>)</li> </ul>	Level II-3; before and after, no control	Absence of control group and follow-up data limits interpretation of findings
Petrie and Azariah 1990 <sup>32</sup>	107 patients with chronic pain (73 completed the study)	Group pain management program combining education, stress management and relaxation training  6-mo follow-up	1. Mental health inventory 2. Coopersmith's self-esteem inventory 3. Sense of coherence scale 4. Pain behaviour checklist	Use of program techniques significantly related to higher positive affect and well-being; overall improvement in general positive affect; 45% of subjects reported improvement ( $p < 0.01$ )	Level II-3; before and after, no control	Limited by self-reporting of data, but useful in suggesting that sense of coherence may be a predictor in identifying pain patients likely to benefit from psychological interventions

Note: RCT = randomized controlled trial; HMO = health maintenance organization; CCU = chronic care unit.



## Limitations of this review

Electronic databases do not cover all of the potential sources of studies of wellness programs. Because we were especially interested in the medical literature and not the social sciences, our review may be incomplete. Also, we specifically excluded studies of patients with cancer and HIV — the populations in which most wellness studies are done — because we were particularly interested in the people seen in the primary care setting.

## Conclusions

The evidence that we reviewed suggests that wellness programs have positive effects on patient outcomes. There is a perception of efficacy among those who participate in them. There is also a suggestion that this type of intervention reduces health service usage.

Clearly, further research is needed to obtain convincing answers to the questions of whether these programs have scientific validity, reduce health care costs and enhance a patient's quality of life. Future studies should use an investigator-blinded, RCT design with a waiting-list control group. Suggested outcome measures include health status, mental status, independent and dependent activities of daily living, quality-of-life scores, depression scores, number of patient visits and billings to health insurance programs. Larger sample sizes are needed, and long-term effects should be investigated by follow-up. Given that large-scale studies may not be feasible, we suggest sequential small studies with comparable interventions, target groups and outcome measures. A meta-analysis could then be applied to determine statistical and clinical significance. Finally, the components and techniques frequently incorporated in wellness programs should be isolated and studied individually for their effectiveness.

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