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Original Article

Effectiveness of Mindfulness-Based Therapy and Counseling Programs Combined with an Exercise Program in Individuals with Non-Communicable Diseases at Subdistrict 5, Khao Phra Ngam, Mueang, Lopburi Province

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Abstract

Objective: Recent studies indicate that Mindfulness-Based Therapy (MBT) is a promising approach for facilitating lifestyle modification in individuals with chronic diseases. However, the effectiveness of Mindfulness-Based Therapy and Counseling (MBTC), suggested by the Department of Mental Health of Thailand, in individuals with non-communicable diseases (NCDs) has been limited. In addition, the short duration of interventions from previous studies has raised concerns about the clinical applicability of MBTC. Therefore, this study evaluated the long-term effects of MBTC combined with a community-based exercise program in individuals with NCDs.

Material and Methods: Eighty-six individuals (aged 47±8.2 years) with metabolic syndrome and NCDs participated in an 8-week supervised MBTC program. Then, they performed daily home practice throughout the 6-month intervention period. Group walking and resistance exercises, as a community-based exercise program, were prescribed to all participants by Village Health Volunteers for 6 months. Body mass index (BMI), waist circumference, blood pressure, fasting blood glucose, stress, and depression levels were measured before and after a 6-month intervention.

Results: MBTC, combined with 6 months of community-based exercise, significantly improved BMI, waist circumference, systolic blood pressure, fasting blood glucose, and depression levels; 16 of 17 participants succeeded in smoking cessation.

Conclusion: Mindfulness-based therapy combined with exercise clinically improves cardiometabolic risk profiles in individuals with metabolic syndrome and NCDs.

Keywords: Mindfulness-based therapy, non-communicable diseases, smoking cessation

Introduction

Non-communicable diseases (NCDs) represent a significant and growing global health burden, accounting for substantial morbidity, mortality, and healthcare costs worldwide.[1] Systematic reviews consistently emphasize that lifestyle modification, including dietary changes, increased physical activity, smoking cessation, and weight management, is central to both the prevention and management of NCDs.[2] Despite the well-established importance of lifestyle modification in NCD management, achieving sustained behavior change remains a significant challenge in clinical practice.[3] Poor self-efficacy skills, inadequate self-

management, and loss of motivation commonly impede adherence to recommended lifestyle modifications.[4] Consequently, integrating behavioral and psychosocial strategies into standard NCD care has been recommended.

In recent years, Mindfulness-Based Therapy (MBT) has emerged as a promising approach to support lifestyle modification among people with chronic diseases.[5] MBT, such as Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT), are structured programs that include meditation practices, body awareness exercises, and group-based training.[6] Evidence shows that MBCT enhances intrinsic motivation and self-regulation in individuals with chronic diseases. By cultivating non-judgmental awareness and intentional behavior, mindfulness practices help individuals recognize unhealthy habitual patterns and improve autonomous decision-making regarding health behaviors.7 In addition, structured counseling and goal-setting strategies may strengthen self-motivation and long-term adherence to lifestyle modification programs.

Studies highlight that integrating MBT with physical activity improves self-awareness, decreases impulsivity, and allows individuals to make intentional lifestyle choices.[8] In addition, it promotes lifestyle-intervention adherence[9] and improves mental health[10] and physiological markers, such as blood pressure[11]. Despite these promising theoretical frameworks, evaluating mindfulness-based therapy combined with counseling on concrete lifestyle modification outcomes in NCD patients remains a challenge. Additionally, short intervention periods limited confidence in the clinical application. Future studies should focus on long-term effects to establish effectiveness in diverse populations.

In 2016, the Department of Mental Health of Thailand developed Mindfulness-Based Therapy and Counseling (MBTC), which integrates various mindfulness programs with practices derived from Buddhist psychotherapy to enhance self-awareness and reduce stress and anxiety.[12] These programs have been reported as effective interventions for substance dependence.[13] [14] However, the effectiveness of the MBTC program in NCD individuals has been underexplored.

Therefore, this study evaluated the effects of a 6-month MBTC program, combined with a community-based exercise program, on physiological and psychological markers among NCD patients in Subdistrict 5, Khao Phra Ngam, Mueang, Lopburi Province, Thailand.

Material and Methods

The study was a prospective quasi-experimental intervention study that investigated the effects of 6 months of MBTC combined with an exercise program in individuals with NCDs in Subdistrict 5, Khao Phra Ngam, Mueang, Lopburi Province. The protocol was approved by Kingnarai Hospital, Lopburi (KNH 07/2568).

Participants

Village Health Volunteers (VHVs) and nurses at Khao Phra Ngam Sub-district Health Promoting Hospital provided information on the study design and its benefits to patients with metabolic syndrome and NCDs in the district. Inclusion criteria were individuals aged 18 years or older who had been diagnosed with type 2 diabetes, hypertension, obesity, or metabolic syndrome by a physician and were able to participate in moderate physical activity. Participants were also required to be willing to participate in the 6-month intervention program and provide written informed consent. Exclusion criteria included unstable cardiovascular disease, severe musculoskeletal disorders limiting exercise participation, severe psychiatric illness, pregnancy, or inability to complete the intervention program.

Eighty-six individuals (aged 47±8.2 years) volunteered to participate in this study. They had type 2 diabetes (n=24), hypertension (n=42), obesity (n=13), and diabetes with hypertension (n=7). Among all participants, seventeen were smokers. Informed consent was obtained from all participants.

Mindfulness-Based Therapy and Counseling (MBTC)

The therapist in this study was certified by the Knowledge Management Center for Behavioral and Psychosocial Care in the Public Health System Phase III: BPSC-III. The MBTC program consisted of 8 modules, each lasting about 90 minutes. Each module included mindfulness training, a review of the previous homework, learning new material, and the next homework assignment. The topics of the 8 modules were as follows:

1) *Dealing with distraction:* Create motivation for mindfulness practice, self-awareness through meditation practice, and breathing exercises.
2) *Mindful living*: Practice mindful daily life, mindful eating, mindful walking; avoid problematic stimuli that can lead to relapse.

3) *Emotional release:* Observe the head-to-toe sensations and physical changes (body scan); notice the negative feelings that arise within the mind (focusing).
4) *Cognitive and emotional release:* Aware of one's thoughts and letting oneself go; aware of negative thoughts; reveal the relationship between negative thoughts and negative behavior.
5) *Relationship rethinking:* Explore negative thoughts when they have problems with their loved ones; train to reduce relationship problems.
6) *Communication improvements:* Recognize problems from unconscious negative communication; mindful speaking; reflect on positive communication.
7) *Compassion and forgiveness:* Awareness of emotion; thoughts and release; consciously giving love and compassion to self and others.
8) *Moving forward in life:* Self-awareness; letting oneself go in the face of daily stress and depression.

No specific calorie-restriction protocol was prescribed during the intervention. The mindfulness and counseling sessions were delivered by a certified MBTC facilitator. The participants met with the therapist in groups of 8-10 once a week for 8 weeks.

After completing the 8-week MBTC program, participants were asked to perform daily home practice throughout the 6-month intervention period. The therapist followed up monthly with each participant to encourage them and identify any obstacles to their intervention program.

Community-Based Exercise Program

Walking was prescribed for all participants 15 minutes after each meal, every day. Postprandial walking has been reported to improve glycemic control, reduce postprandial glucose excursions, and enhance metabolic and energy utilization processes by increasing glucose uptake and muscular energy expenditure after meals in individuals with type 2 diabetes and metabolic disorders.[15] Group walking exercise was scheduled 3 days a week, 30 minutes per session. Exercise intensity was prescribed at a moderate level and monitored during the sessions using the Borg Rating of Perceived Exertion (RPE) scale, corresponding to an RPE of 11–13. Participants were also instructed to maintain a comfortable pace that allowed conversation during walking sessions (talk test). Village Health Volunteers monitored

participants during group exercise sessions to ensure safety and adherence. After the walking session, a 15-minute group resistance exercise was prescribed for the major muscle groups. VHVs led the group exercise for walking and resistance training. In total, participants walked around 300 minutes/week. Participants were instructed to track exercise in the logbook. The researcher reviewed the logbook weekly for 8 weeks and monthly thereafter through the end of the 6-month intervention.

Participants continued receiving their usual medical care and standard treatment throughout the study period. The VHVs regularly monitored participants' health status and oversaw other co-interventions throughout the study period.

Outcome measures

All measurements were assessed on-site. The researcher reviewed the medical history, alcohol use, smoking history, and fasting blood sugar. All anthropometric and physiological measurements were performed by the same trained healthcare personnel using the same instruments throughout the study. Weight and height were measured using a calibrated TANITA BC-541N body composition monitor, with participants wearing light clothing and no shoes. Body mass index (BMI) was calculated as weight in kilograms divided by height in square meters. Waist circumference was measured in the standing position at the midpoint between the lower rib margin and the iliac crest at the end of normal expiration. Blood pressure was measured with an OMRON HEM-7120 automated blood pressure monitor after participants had rested for at least 5 minutes in a seated position. Two blood pressure measurements were obtained, and the average value was recorded for data analysis. Fasting blood glucose was assessed using an ACCU-CHEK Guide glucose monitoring system. Perceived stress levels were assessed using the Stress Test-20, developed by the Department of Mental Health, Ministry of Public Health, Thailand, which has demonstrated high validity and reliability.[16] The Patient Health Questionnaire-9 (PHQ-9) is used to measure the severity of depression.

Statistical analysis

Data were analyzed using IBM SPSS Statistics version 26 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize participant characteristics and study outcomes, including means, standard deviations, frequencies, and percentages. The

Kolmogorov–Smirnov (K–S) Test was used to assess normality. The paired t-test was used to compare baseline and post-intervention values. A p-value less than 0.05 was considered significant.

Results

Eighty-six participants with NCDs completed the 6-month intervention without dropping out. All participants achieved ≥ 80% adherence due to weekly follow-up by VHV throughout the study period. Exercise logbooks indicated that most participants regularly engaged in postprandial walking and attended group exercise sessions throughout the intervention period. The average total exercise duration was approximately 150 minutes per week. As shown in Table 1, MBTC, when combined with an exercise program, improved cardiovascular risk factors. Body mass (68.21 ± 13.71 kg vs. 65.74 ± 13.16 kg), BMI (25.84 ± 3.15 kg/m^2 vs. 24.90 ± 2.91 kg/m^2), and waist circumference (87.34 ± 6.53 cm vs. 84.91 ± 6.03 cm) decreased significantly after the 6-month intervention ($p<0.05$). Systolic (140 ± 10 mmHg vs. 131 ± 7 mmHg) and fasting blood sugar (115.6 ±17.9 mg/dL vs. 103.8 ± 11.5 mg/dL) improved after completing the program ($p<0.05$).

Regarding psychological factors, the intervention significantly reduced the severity of depression from 3.62 ± 3.16 to 2.47 ± 2.40 ($p < 0.05$); 16 of 17 participants achieved smoking cessation after completing the intervention.

Discussion

The salient finding of the present study was that MBTC, combined with a community-based exercise program, promoted smoking cessation success and improved cardiovascular risk factors in individuals with NCDs. These results align with previous research[17], underscoring the importance of adopting comprehensive strategies that incorporate both psychological interventions and lifestyle modifications to effectively manage NCDs and promote overall health.

The intervention was implemented in a real-world community setting, enhancing the program's practical applicability and feasibility for individuals with NCDs in rural communities. The involvement of village health volunteers played an important role in

promoting participant engagement, adherence, and continuity of the intervention through regular encouragement and community support. In addition, the intervention incorporated simple, low-cost, and culturally appropriate lifestyle modification strategies, such as postprandial walking and group-based exercise activities, making the program feasible for long-term implementation in primary healthcare and community settings. The integration of multidisciplinary health promotion approaches that address both behavioral modification and community participation may contribute to sustainable health outcomes among participants.

The most notable outcome in this study was that 16 of 17 participants successfully quit smoking, which highlights the potential of combining mindfulness treatment with traditional counseling to enhance smoking cessation efforts, particularly in addressing the psychological aspects of nicotine dependence.[18] Evidence indicates that the success rate for smoking cessation is 10–15% with nicotine replacement therapy[19], 20–30% with varenicline and bupropion medication[10], and 10–5% with cognitive behavioral therapy,[20] whereas the effectiveness of mindfulness-based therapy is higher than traditional smoking cessation interventions. The systematic review and meta-analysis reported that mindfulness interventions showed higher abstinence rates than control conditions, with pooled estimates of 25–30% at follow-up, depending on measurement timing,[21] which is consistent with the results of this study, which show a high rate of smoking cessation. The exercise component may have further supported cessation efforts. Exercise plays a significant role in mitigating nicotine withdrawal symptoms, enhancing psychological well-being, and improving physical health and body awareness.[22]

BMI and waist circumference, the key measurements for assessing health risks related to body weight, decreased significantly in our NCD population after completing the MBTC and exercise program. The MBTC technique may improve eating behavior, enhance the self-regulation of reward processing[23], reduce stress and cortisol exposure[24], improve metabolic and inflammatory profiles, and improve autonomic regulation.[23] When combined with regular physical activity, this appears to produce sustainable weight-management effects. Unlike conventional weight-loss programs, which often show significant regression to baseline over time, the mindfulness component may foster lasting behavioral changes by addressing emotional eating patterns and stress-related food consumption.

Systolic blood pressure (SBP) decreased approximately 9 mmHg after 6 months of MBTC and community-based aerobic and resistance training. A large meta-analysis of 48 randomized trials involving 344,716 participants reported that a 5-mmHg reduction in SBP was

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associated with approximately a 10% reduction in the risk of major cardiovascular events.[25] Stronger effects occur with larger reductions. A meta-regression in patients with type 2 diabetes reported that a 10-mmHg decrease in SBP was associated with a 33% reduction in stroke risk.[26] From an evidence-based perspective, our multidisciplinary intervention clearly demonstrated clinical meaningfulness due to substantial reductions in stroke and coronary risk in a high-risk population. Several physiological mechanisms may explain the observed improvement. First, mindfulness practices reduce psychological distress, which in turn may attenuate sympathetic activation and decrease peripheral vascular resistance.[27] Second, enhanced emotional regulation and self-awareness may facilitate sustained engagement in physical activity and heart-healthy dietary behaviors. Third, exercise improves endothelial function, arterial compliance, and nitric oxide bioavailability, which collectively reduce systemic blood pressure.[28] When combined, these pathways may amplify cardiovascular adaptations beyond those achievable with either intervention alone.

MBTC, combined with community-based exercise, significantly reduced fasting blood glucose in the present study. These results, consistent with evidence from randomized controlled trials, suggest that combining mindfulness with lifestyle modification can improve glucose regulation.[29] Exercise has been recognized as a non-pharmacological intervention to improve insulin sensitivity[30], whereas mindfulness-based therapy enhances self-regulation, attention to bodily cues, and adherence to health-promoting behaviors, potentially increasing long-term engagement in physical activity and dietary management. Such behavioral sustainability is particularly relevant for chronic disease populations, where consistent lifestyle modification is critical for preventing disease progression.

Depression is highly prevalent among individuals with NCDs and represents a major contributor to diminished quality of life, poor treatment adherence, and increased morbidity.[31] The present findings, demonstrating that mindfulness-based intervention combined with exercise significantly decreased depression levels in patients with NCDs, align with a growing body of evidence supporting integrative mind–body approaches in chronic disease management. Mindfulness may enhance self-efficacy and internal motivation, thereby increasing adherence to exercise programs. Sustained participation in physical activity has been identified as a moderator of psychological improvement, with longer intervention durations producing greater reductions in depressive symptoms.[32]

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Limitation

This study provided clinical implications for integrating mindfulness-based interventions with lifestyle modification in the long term. However, a key limitation is the absence of a control group, which restricts the ability to attribute the observed improvements solely to the intervention. Therefore, the results should be interpreted with caution, and future randomized controlled trials are warranted to confirm the effectiveness of this intervention. Disease severity, duration of illness, medication adjustment, and level of disease control were not fully controlled, which may have acted as potential confounding factors.

Conclusion

Mindfulness-based therapy combined with exercise has increasingly been recognized as a promising nonpharmacological strategy for NCD management. The significant improvements observed in BMI, waist circumference, SBP, fasting blood glucose, and depression levels in the present study are consistent with a growing body of literature demonstrating that behavioral and lifestyle interventions targeting both psychological stress and physical inactivity can yield clinically meaningful cardiovascular benefits.

Conflict of Interest

The authors declare that they have no conflicts of interest: financial, professional, or personal.

Financial disclosure

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Table 1: Participant characteristics, metabolic risk factors, and psychological factors

Variable	**Before (n = 86)**	**After (n = 86)**
Men/Women, n	29/57	29/57
Age, years	47.3 ± 13.0	
Height, cm	161.8 ± 10.7	
Smoking, n	17	1
Body weight, kg	68.2 ± 13.7	65.7 ± 13.2*
Body mass index, kg/m^2	25.8 ± 3.1	24.9 ± 2.9*
Waist circumference, cm	87.3 ± 6.5	84.9 ± 6.0*
Heart rate, beats/min	84 ± 6	81 ± 4.7
Systolic blood pressure, mmHg	140 ± 10	131 ± 7 *
Diastolic blood pressure, mmHg	90 ± 5	88 ± 4
Fasting blood sugar (mg/dL)	115.6 ±17.9	103.8 ± 11.5*
Stress levels	11.7 ± 3.6	10.97 ± 3.2
Depression severity	3.6 ± 3.2	2.4 ± 2.4*

Values are mean ± SD *$p<0.05$ versus before.

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