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Research Article

# Smart Counseling Model For Dietary and Physical Activity Patterns to Promote Healthy Lifestyle Awareness: A Community-Based Intervention Study

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**Abstract**
Non-communicable diseases (NCDs) driven by unhealthy dietary habits and physical inactivity represent a growing public health challenge in Indonesia. This study aimed to design and implement a smart counseling model integrating Motivational Interviewing (MI) and Cognitive Behavioral Therapy (CBT) to promote healthy lifestyle awareness among members of the Sereale Family Harmony Group (Kerukunan Keluarga Sereale) in Makassar, South Sulawesi. A pre-experimental design with a one-group pre-test post-test approach was employed. Eighteen members aged 25-60 years participated, with 16 completing all sessions (participation rate 88.9%). The intervention consisted of four structured group counseling sessions (60-90 minutes each) and individual sessions (45-60 minutes), delivered over four weeks in April-May 2026. Data were collected using a validated Knowledge, Attitude, and Practice (KAP) questionnaire (CVI=0.89), anthropometric measurements, and the Transtheoretical Model (TTM) readiness-to-change scale. Results demonstrated significant improvements: mean nutrition knowledge scores increased from 58.3 to 82.6 (41.7% improvement); attitude scores toward healthy lifestyle improved from 3.1 to 4.2 on a Likert scale (35.5% improvement); proportion meeting recommended fruit and vegetable intake rose from 25% to 62.5%; and proportion meeting physical activity recommendations increased from 18.75% to 56.25%. Participants in the action and maintenance stages of TTM increased from 12.5% to 68.75%. The MI-CBT integrated counseling model proved effective in enhancing healthy lifestyle awareness in this community setting, offering a replicable model for community-based NCD prevention programs in similar socio-cultural contexts.

Keywords: counseling model; dietary patterns; physical activity; healthy lifestyle; community intervention; motivational interviewing; cognitive behavioral therapy

## INTRODUCTION

Non-communicable diseases (NCDs) have emerged as the foremost public health challenge in Indonesia and globally. According to the 2023 Basic Health Research (Riskesdas), the prevalence of obesity among Indonesian adults has reached 27.7%, while hypertension affects 34.1% of the population aged 18 years and above (Kemenkes RI, 2023). Compounding this concern, only 33.5% of Indonesians meet the recommended minimum of 150 minutes of physical activity per week. The World Health Organization (WHO, 2022) affirms that up to 80% of NCD cases are preventable through lifestyle modifications, including improved dietary practices and regular physical activity.

The Sereale Family Harmony Group (Kerukunan Keluarga Sereale) is a social community in Makassar, South Sulawesi, comprising families sharing a common regional origin. Preliminary assessment revealed that the majority of members exhibited imbalanced dietary patterns high in simple carbohydrates and saturated fat, low in vegetables and fruit alongside significantly limited physical activity due to occupational demands and low motivation. A notable proportion of members were overweight or obese, and several had been diagnosed with hypertension and type 2 diabetes mellitus.

Conventional one-way health education has proven insufficiently effective in sustaining behavioral change (Lundahl et al., 2013). Health counseling offers a more personalized, empowerment-oriented alternative capable of exploring personal barriers, motivating intrinsic change, and supporting individuals in designing realistic behavioral action plans. Motivational Interviewing (MI), a client-centered directive approach, and Cognitive Behavioral Therapy (CBT), a structured psychotherapeutic framework targeting maladaptive cognitions, represent evidence-based approaches particularly suited to lifestyle modification in community settings (Miller & Rollnick, 2013; Beck, 1979).

This study aimed to design and implement an integrated MI-CBT counseling model targeting dietary consumption and physical activity patterns to enhance healthy lifestyle awareness among Sereale Family Harmony Group members. The novelty of this study lies in the contextually adapted integration of MI and CBT within a community-based social group setting in Eastern Indonesia, addressing the gap in culturally responsive counseling interventions for NCD prevention at the community level.

## RESEARCH METHOD

### *Research Design*

This study employed a pre-experimental design with a one-group pre-test post-test approach. The design was selected to evaluate changes in knowledge, attitude, and practice (KAP) related to dietary consumption and physical activity before and after the counseling intervention, without a control group. The counseling program combined individual and group counseling formats, integrating Motivational Interviewing (MI) and Cognitive Behavioral Therapy (CBT) as the theoretical framework.

### *Setting and Participants*

The study was conducted at the Sereale Family Harmony Group Secretariat in Makassar, South Sulawesi, Indonesia, from April to May 2026. Participants were 18 active members aged 25-60 years identified through initial assessment as having unhealthy dietary patterns and/or physical inactivity. Inclusion criteria were: active membership, age ≥18 years, not undergoing intensive medical treatment, and willingness to provide informed consent. A total of 16 participants completed all program sessions (participation rate 88.9%).

### *Counseling Intervention*

The counseling program comprised four structured group sessions (60-90 minutes each) and one to two individual sessions per participant (45-60 minutes each). Session 1 focused on rapport-building, in-depth assessment, and personal goal-setting using open-ended questions and SMART goal-setting techniques. Session 2 addressed balanced nutrition education through MI-OARS techniques and identification of cognitive distortions (CBT cognitive restructuring). Session 3 developed individualized physical activity plans and employed behavioral activation and problem-solving training to address

personal barriers. Session 4 evaluated participant progress, reinforced behavioral commitments through change talk and relapse prevention planning, and established long-term maintenance strategies.

***Data Collection Instruments***

Data were collected using: (1) a validated KAP questionnaire (Content Validity Index = 0.89) comprising 20 nutrition knowledge items, 15 Likert-scale attitude items, and 10 practice items; (2) anthropometric measurements including body weight, height, waist circumference, and blood pressure; (3) daily food diaries and weekly activity logs (self-monitoring forms); (4) the Transtheoretical Model (TTM) readiness-to-change scale (Prochaska & DiClemente, 1983) administered pre- and post-intervention; and (5) a session observation form completed by the co-facilitator.

***Data Analysis***

Data were analyzed using descriptive statistics to calculate means, proportions, and percentage changes pre- and post-intervention. KAP scores were compared between pre- and post-test using paired analysis. TTM stage distributions were compared to evaluate readiness-to-change progression. Qualitative data from session observations and participant reflections were analyzed thematically.

## RESULTS AND DISCUSSION

There are 18 participants invited, 16 completed the full program (participation rate 88.9%). Most participants were female (62.5%) and aged 35-50 years (68.75%), working as homemakers or private employees. Anthropometric assessment at baseline revealed that 56.25% had BMI above normal range (overweight/obese), and 43.75% had waist circumference exceeding the NCD risk threshold. Pre-test results showed a mean nutrition knowledge score of 58.3/100 (adequate category), with only 31.25% demonstrating good knowledge. The mean attitude score was 3.1/5 (Likert scale), indicating a relatively neutral disposition toward healthy lifestyle behaviors. Regarding practices, 75% consumed fewer than three servings of vegetables and fruit per day, 81.25% did not meet weekly physical activity recommendations, and 62.5% consumed high-fat foods more than five times per week.

Post-intervention evaluation demonstrated significant improvements across all outcome measures. Mean nutrition knowledge scores increased from 58.3 to 82.6 (a 41.7% improvement), while mean attitude scores toward healthy lifestyles rose from 3.1 to 4.2 (a 35.5% improvement). The proportion of participants meeting recommended fruit and vegetable consumption increased from 25% to 62.5%, and those meeting physical activity recommendations rose from 18.75% to 56.25%. Based on the TTM scale, participants in the action and maintenance stages increased from 12.5% to 68.75%. Table 1 summarizes the key pre-intervention and post-intervention outcomes.

Table 1. Pre-Intervention and Post-Intervention KAP Outcomes Among Sereale Family Harmony Group Members (n=16)

| No. | Outcome Indicator | Pre-test |
|---|---|---|
| 1 | Mean Nutrition Knowledge Score | 58.3 → 82.6 (+41.7%) |
| 2 | Mean Attitude Score | 3.1 → 4.2 (+35.5%) |
| 3 | Participants Meeting Recommended Fruit and Vegetable Consumption | 25% → 62.5% |
| 4 | Physical Activity Recommendations Rose | 18.75% → 56.25% |
| 5 | Action and Maintenance Stages | 12.5% → 68.75% |

The significant improvements across all KAP domains confirm the effectiveness of the integrated MI-CBT counseling model. The 41.7% improvement in nutrition knowledge scores aligns with findings from Resnicow & McMaster (2012), who reported that MI-based interventions consistently enhance health knowledge by more than 30% compared to conventional health education. The substantial increase in participants reaching the TTM action and maintenance stages (from 12.5% to 68.75%) reflects the model's capacity to facilitate genuine readiness for behavioral change.

The effectiveness of the program can be explained through several theoretical mechanisms. MI techniques, particularly OARS (Open-ended questions, Affirmations, Reflective listening, Summarizing) and change talk facilitation, successfully resolved participant ambivalence toward lifestyle change by

strengthening intrinsic motivation the most reliable predictor of long-term behavioral change (Miller & Rollnick, 2013). CBT cognitive restructuring effectively identified and modified maladaptive beliefs such as "healthy food is boring", transforming them into constructive cognitions contextualized within Sulawesi culinary culture. The strong social cohesion within the Sereale Family Harmony Group created a protective group dynamic that amplified the counseling effect through mutual encouragement, consistent with Bandura's (1986) Social Cognitive Theory regarding social support and behavioral modeling. The novelty of this study lies in its culturally-tailored integration of MI and CBT within an Eastern Indonesian community social group, demonstrating the transferability of evidence-based counseling frameworks to community-specific contexts without loss of effectiveness.

## CONCLUSION

The integrated MI-CBT counseling model designed and implemented for the Sereale Family Harmony Group demonstrated significant effectiveness in improving healthy lifestyle awareness. The program achieved a 41.7% improvement in nutrition knowledge, a 35.5% improvement in attitudes toward healthy behaviors, a 37.5% increase in participants meeting recommended fruit and vegetable consumption, a 37.5% increase in those meeting physical activity recommendations, and a 56.25% increase in participants in the action and maintenance stages of behavioral change. The strong social cohesion of the community group served as an important facilitating factor. These findings support the scalability of this culturally-responsive, MI-CBT integrated community counseling model as an effective complementary strategy for NCD prevention programs in similar community settings across Indonesia. Future research with stronger experimental designs (randomized controlled trials) and longer follow-up periods is recommended to confirm long-term sustainability of behavioral change.

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## AUTHOR CONTRIBUTIONS

Conceptualization, H.M.P., and R.M.L.; Methodology, H.M.P. and F.L.T; Investigation, H.M.P., and R.M.L.; Data Curation, R.M.L.; Formal Analysis, H.M.P.; Writing – Original Draft Preparation, A.T.; Writing Review & Editing, H.M.P. and R.M.L.; Supervision, F.L.T. All authors have read and agreed to the published version of the manuscript.

## CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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