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REVIEW

Informing China's "Weight Management Year" with Global Evidence: A Systematic Review and Meta-Analysis of Community-Based Strategies

Yan Zhang

Department of General Practice, Liangzhu Community Health Service Center, Hangzhou, Zhejiang, People's Republic of China

Correspondence: Yan Zhang, Department of General Practice, Liangzhu Community Health Service Center, 151 Yuzong Road, Hangzhou, Zhejiang, 311100, People's Republic of China, Email zy15869103457@163.com

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Background: The "Weight Management Year" (2024–2026) is a key national policy in China that prioritizes community-based strategies to combat the growing obesity epidemic. However, a comprehensive synthesis of global evidence on the effectiveness of community-led interventions, which could inform the implementation of this policy, remains lacking.

Methods: We conducted a systematic review and meta-analysis following PRISMA guidelines. Eight electronic databases were searched from January 1, 2015, to April 30, 2025. We included randomized controlled trials (RCTs), cluster-RCTs, and other high-quality experimental or observational studies (eg, quasi-experimental studies, service evaluations) assessing non-pharmacological, community-based weight management interventions in diverse global settings, with a focus on extracting insights applicable to China's context. Meta-analyses were performed for body weight and BMI outcomes where data were available.

Results: Fifteen studies were included in the qualitative synthesis, with seven providing data for meta-analysis. The pooled results showed that community-led interventions were effective in improving several health outcomes. A meta-analysis of four RCTs (n = 641) on body weight change did not show a statistically significant reduction overall (MD: −1.16 kg, 95% CI: −3.19 to 0.86). However, a meta-analysis of six RCTs (n = 1376) demonstrated a statistically significant reduction in body mass index (MD: −1.57 kg/m^2, 95% CI: −2.74 to −0.39). Beyond anthropometrics, evidence from large-scale and culturally adapted studies across different countries indicated that such interventions also reduced cardiovascular risk, improved blood pressure and glycemic control, and enhanced health behaviors.

Conclusion: Synthesizing global evidence within the framework of China's "Weight Management Year" indicates that community-led strategies—including digital health, multi-sector collaboration, and cultural adaptations—are effective in achieving short- to medium-term health improvements. To fully realize the policy's potential, future efforts in China should focus on institutionalizing successful models adapted from international experience, strengthening frontline capacity, and ensuring long-term sustainability.

Keywords: weight management year, community-based interventions, systematic review, meta-analysis, health outcomes, global evidence

Introduction

The global obesity epidemic poses a critical public health challenge, straining healthcare systems and economies worldwide.[1] In China, this issue is particularly acute, with more than half of the adult population affected by overweight or obesity, significantly elevating the risk of non-communicable diseases.[2] These diseases, particularly coronary artery disease and type 2 diabetes, have been linked to specific genetic predispositions in Asian populations, underscoring the complex interplay between biology and lifestyle that community interventions must address.[3] As a strategic national response, the Chinese government launched the "Weight Management Year" (2024–2026), a pivotal three-year initiative embedded within the "Healthy China 2030" framework. This campaign marks a decisive shift from treatment-oriented care toward integrated, population-wide prevention, with community-based action as its central pillar.[4]

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Communities are uniquely positioned to bridge national policy and local realities, offering geographic accessibility, social support networks, and the capacity for cultural adaptation—each crucial for enabling sustainable behavior change.[5,6] The "Weight Management Year" explicitly envisions communities as active agents in implementing tailored interventions, delivering basic health services, and mobilizing cross-sector resources.

Nevertheless, a clear gap persists between the policy's vision and the synthesized evidence supporting its implementation. While studies on weight management in China exist, they often focus on isolated clinical trials or specific subpopulations,[7,8] lacking a comprehensive and policy-aware synthesis of the diverse community-led strategies now being promoted. Prior reviews have typically examined narrow intervention types—such as digital or school-based programs alone—overlooking the multifaceted and coordinated approaches advocated under the current policy.[9,10]

To address this gap, this systematic review and meta-analysis evaluates the health benefits and implementation pathways of community-led weight management interventions aligned with China's "Weight Management Year". This review aims to: (1) categorize and summarize the current typologies of community-driven strategies; (2) synthesize their effects on key physiological, behavioral, and cardiometabolic outcomes through meta-analysis where feasible; and (3) identify evidence gaps and practical implications to guide future policy scaling and research prioritization.

Methods

We conducted a systematic review with a planned meta-analysis. The reporting of this review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.[11]

Data Sources and Searches

A systematic literature search was conducted by a health science librarian in June 2025 across eight databases: PubMed, Web of Science, Embase, the Cochrane Central Register of Controlled Trials (CENTRAL), China National Knowledge Infrastructure (CNKI), Wanfang Data, the VIP Database, and the Chinese Biomedical Literature Database (CBM). Searches in the four Chinese databases (CNKI, Wanfang, VIP, and CBM) were limited to journals indexed in two major Chinese systems: the Chinese Core Journals Overview and the China Science and Technology Core Journals. For each database, a combination of controlled vocabulary (eg, Medical Subject Headings [MeSH] for PubMed, Emtree for Embase) and free-text keywords was used. The strategy was adapted for each database while maintaining conceptual consistency. For example, the search strategy executed in PubMed was: (((((Obesity[MeSH Terms])) OR (Overweight [Title/Abstract])) OR (BMI[Title/Abstract])) AND ((((Community Health Services[MeSH Terms])) OR (Primary Health Care[MeSH Terms])) OR (community-based[Title/Abstract]))) AND ((Adult[MeSH Terms])) AND ("2015/01/01"[Date - Publication]: "2025/04/30"[Date - Publication]). Similar strategies were designed for the other databases. The full search strategies for all databases are available in Supplementary File 1. Additionally, the bibliographies of relevant review articles and eligible studies were manually searched to identify any additional records.

Eligibility Criteria and Study Screening

The inclusion criteria for this review were as follows: (1) participants were adults (aged ≥18 years) with overweight or obesity or related cardiometabolic risks (hypertension, prediabetes, metabolic syndrome); (2) the intervention was a community-based, non-pharmacological program aimed at weight management or cardiometabolic health improvement (lifestyle modification, digital health support, culturally adapted activities); (3) studies reported at least one predefined outcome from the following categories: anthropometric measures (body weight, body mass index, waist circumference); cardiometabolic measures (systolic blood pressure, diastolic blood pressure, fasting blood glucose, 2-hour postprandial blood glucose, glycated hemoglobin, total cholesterol, triglycerides, high-density lipoprotein cholesterol); behavioral outcomes (physical activity levels, dietary intake, adherence scores); psychosocial outcomes (self-efficacy, knowledge, quality of life scores, SF-36 scores); or health economic outcomes (cost-effectiveness metrics); (4) the study design was a randomized controlled trial (including cluster-randomized trials and multi-arm trials) or other experimental or observational study designs capable of providing high-quality evidence on community-led interventions, including quasi-experimental studies, service evaluations, and cost-effectiveness analyses; and (5) the intervention was delivered in a community, primary care, or real-world public health setting (community health centers, schools, villages, workplaces,

or through community health workers), making its experience potentially transferable to the community-focused approach of China's "Weight Management Year". No geographical restrictions were applied to ensure the inclusion of diverse global evidence. Study selection was conducted independently by two reviewers through title/abstract screening followed by full-text review. Any disagreements were resolved through discussion or, when necessary, adjudication by a third senior reviewer.

Data Extraction

For each included study, two reviewers independently extracted data using a standardized data extraction form. The form captured study characteristics (author, publication year, country/region, study design), participant characteristics (sample size, age, health status defined as overweight, obesity, hypertension, prediabetes, or metabolic syndrome), and intervention details (type, components, delivery mode, setting, duration). Outcome data were extracted for all reported measures under the following prespecified categories: body weight; body mass index; waist circumference; systolic and diastolic blood pressure; fasting blood glucose, 2-hour postprandial blood glucose, and glycated hemoglobin (HbA1c); blood lipid profiles (total cholesterol, triglycerides, high-density lipoprotein cholesterol); behavioral outcomes (physical activity levels, dietary intake, adherence scores); psychosocial outcomes (self-efficacy, knowledge, quality of life scores, SF-36 scores); and health economic outcomes (cost-effectiveness metrics). For the meta-analyses on body weight and BMI change, baseline and post-intervention means, standard deviations, and sample sizes were extracted for intervention and control groups. One reviewer performed the initial extraction, and a second reviewer independently verified all entries; discrepancies were resolved through consensus or by consultation with a third senior reviewer.

Quality Appraisal

The risk of bias in the included studies was assessed using two tools tailored to their respective study designs. For randomized controlled trials (RCTs), including cluster-RCTs, the revised Cochrane Risk of Bias tool (RoB 2.0)[12] was employed. This tool evaluates five domains: (1) bias arising from the randomization process, (2) bias due to deviations from intended interventions, (3) bias due to missing outcome data, (4) bias in measurement of the outcome, and (5) bias in selection of the reported result. Each domain was judged as having "low risk", "some concerns", or "high risk" of bias, leading to an overall risk of bias judgment for each study. Two reviewers independently conducted the risk of bias assessments. Any discrepancies between their judgments were resolved through discussion or, if necessary, by arbitration from a third senior reviewer. The overall risk of bias for each study was summarized and is presented graphically in Figures 1 and 2.

Data Synthesis and Analyses

The data synthesis and meta-analysis were conducted using RevMan (Review Manager) version 5.4 and R software for primary statistical analyses, including data entry, effect size pooling, heterogeneity assessment, and generation of forest plots. The risk of bias for included randomized controlled trials was assessed using the RoB 2 tool implemented in R. Given the anticipated clinical and methodological diversity among included studies, a random-effects model was prespecified and applied to calculate the pooled mean difference (MD) with its corresponding 95% confidence interval for changes in body weight and body mass index (BMI). For each study included in the meta-analyses, baseline and post-intervention means and standard deviations (SDs) for weight and BMI were extracted for both intervention and control groups. Following the recommendations of the Cochrane Handbook, change-from-baseline values and their SDs were calculated for each group based on sample sizes, means, and SDs at baseline and follow-up. The study-specific mean difference between the intervention and control groups was then derived for meta-analysis pooling. Heterogeneity across studies was assessed using the Cochran's Q test (with a significance level of $P < 0.10$ indicating statistical significance), quantified by the I^2 statistic (where $I^2 > 50\%$ was considered to represent substantial heterogeneity), and estimated by Tau^2 (representing the variance of true effect sizes under the random-effects model).

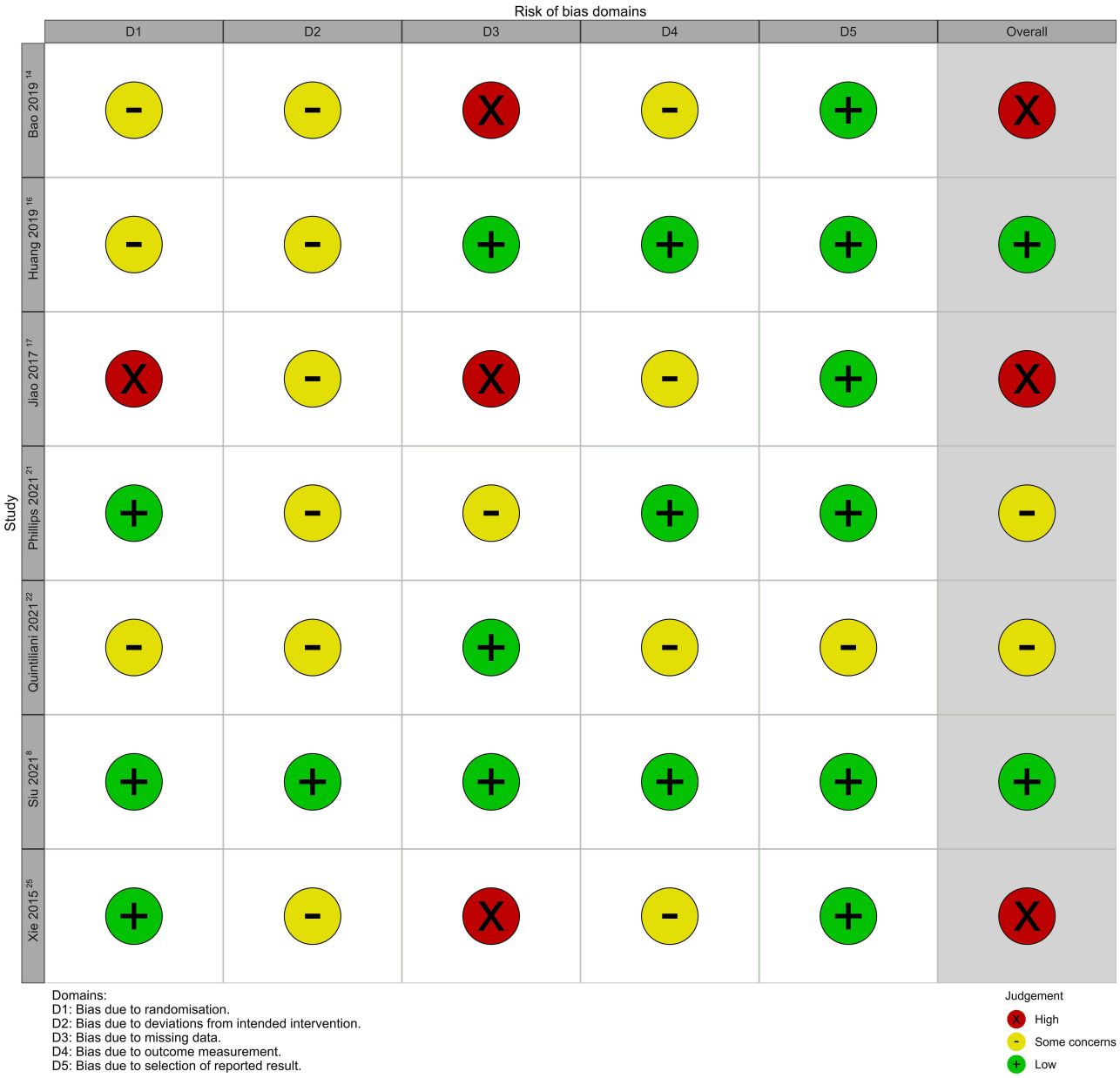

Figure 1 Risk of bias traffic light plot of included randomized controlled trials using the revised Cochrane Risk of Bias tool (RoB 2).

Results

Study Selection

The study selection process is detailed in the PRISMA flow diagram (Figure 3). A total of 6555 records were identified through database searches (n = 6274) and other sources (n = 281). After removing duplicates, 3912 records underwent title and abstract screening. Of these, 124 full-text articles were assessed for eligibility. Following detailed evaluation, 15 studies met all inclusion criteria and were included in the qualitative synthesis (systematic review). Among these, 7 studies provided sufficient data on prespecified continuous outcomes (changes in body weight and/or BMI) and were included in the quantitative synthesis (meta-analysis). The most common reasons for exclusion at the full-text stage were non-community-led interventions and review/commentary articles.

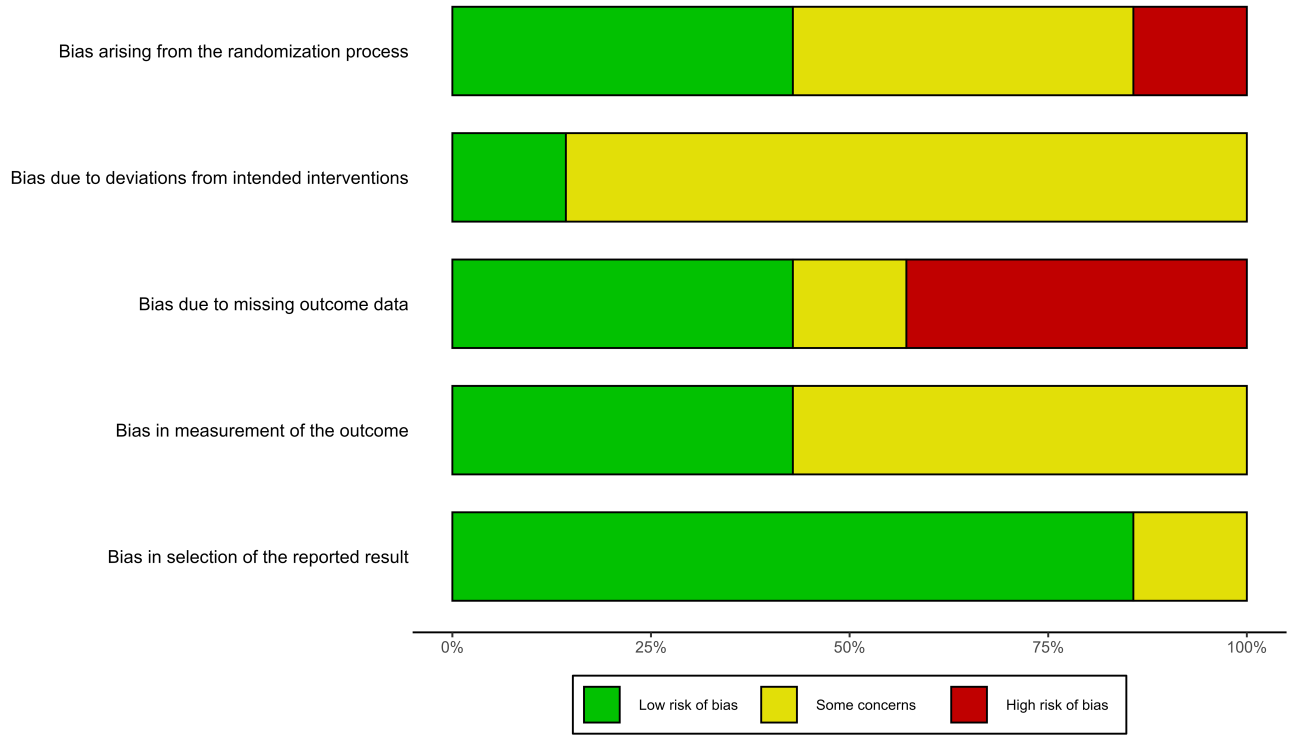

Figure 2 Risk of bias summary plot of included randomized controlled trials using the revised Cochrane Risk of Bias tool (RoB 2).

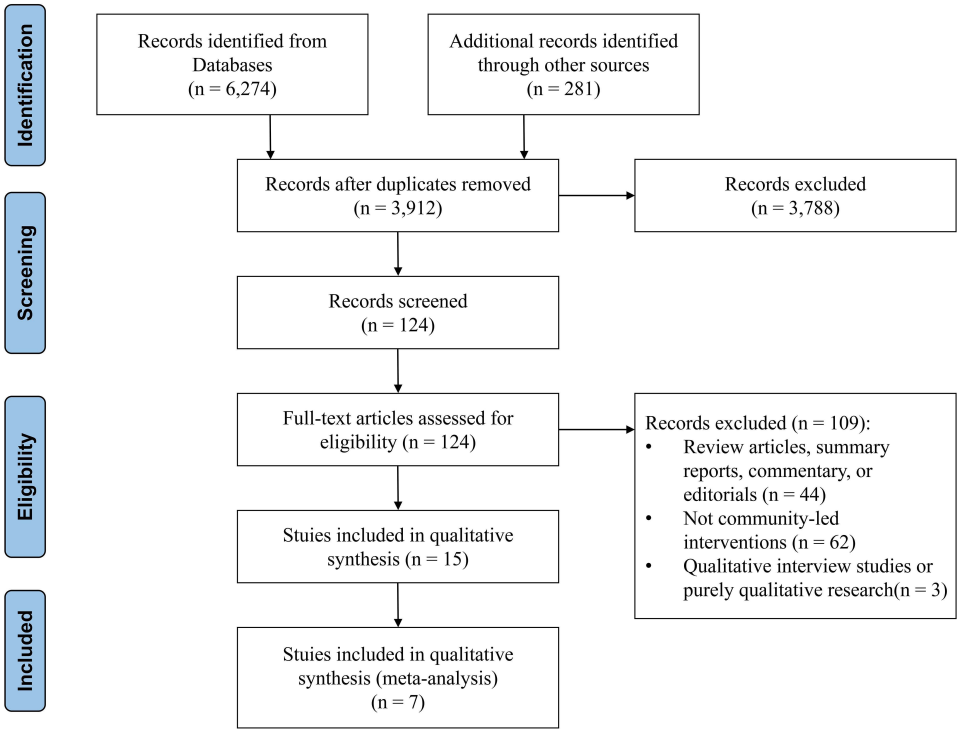

Figure 3 PRISMA flow diagram of the study selection process for the systematic review.

Results of Quality Appraisal

The seven randomized controlled trials included in the meta-analysis were evaluated using the revised Cochrane Risk of Bias tool (RoB 2), with detailed results presented in Figures 1 and 2. The specific risk proportions for each bias domain are as

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follows: In the randomization process (D1), approximately 43% of the studies were rated as low risk, about 43% raised some concerns, and around 14% were high risk. For deviations from intended interventions (D2), approximately 14% were low risk, about 86% raised some concerns, and no studies were rated as high risk. In the domain of missing outcome data (D3), approximately 43% were low risk, about 14% raised some concerns, and around 43% were high risk. Regarding outcome measurement (D4), approximately 43% were low risk, about 57% raised some concerns, and no studies were high risk. For selection of the reported result (D5), approximately 86% were low risk, about 14% raised some concerns, and similarly, no studies were high risk. Overall, the majority of the included studies demonstrated favorable risk control across key methodological domains, indicating sound reliability to support subsequent evidence synthesis.

Characteristics of Included Studies

The characteristics of the 15 studies included in the systematic review are presented in Table 1. The studies were published between 2015 and 2024 and originated from multiple countries, including China (n = 9), the United States (n = 4), the United Kingdom (n = 2), and Switzerland (n = 1). Various study designs were employed, such as randomized controlled trials (RCTs), cluster-RCTs, cost-effectiveness analyses, mixed-methods studies, and quasi-experimental designs. Sample sizes varied widely, ranging from 52 to 1,094,676 participants. The interventions were diverse and included community-based lifestyle modification, family health programs, integrated traditional Chinese and Western medicine health management, digital health support, group behavioral guidance, and combined diet and exercise interventions. Intervention durations ranged from several weeks to long-term engagement. Among the 15 studies,

Table 1 Characteristics of Included Studies Evaluating Community-Led Weight Management Interventions Within China's "Weight Management Year" Policy Framework

Study/Country/ Study Design	Sample Size	Population Age/ Disease	Intervention (Duration)	Main Outcome Indicators
Backman et al, 2022;[13] USA; RCT	70	21–45 years old, overweight/obese, low-income females	Koa Family Program (weekly Zoom health education, social media support, tree-planting activities) (17 weeks)	Weight, improvement in diet and physical activity, enhancement of self-efficacy
Bao et al, 2019;[14] China; RCT	140	16–54 years old, overweight/obese	Intervention (community health management + TCM health preservation); Control (routine community health management) (6 months)	Weight, BMI, SF-36 quality of life scores
Hoch et al, 2024;[15] USA; Cost-Effectiveness Analysis (CEA)	70	21–45 years old, overweight/obese, low-income females	Koa Family Program (17 weeks)	Incremental cost-effectiveness ratio per 1 lb weight loss, incremental net benefit, cost-effectiveness acceptability probability
Huang et al, 2019;[16] China; RCT	292	≥55 years old, prehypertension	Intervention (PDCA cycle-guided exercise intervention); Control (routine exercise management) (1 year)	Blood pressure, BMI, WC, FBG, lipids (total cholesterol, triglycerides)
Jiao et al, 2017;[17] China; RCT	120	23–73 years old, prediabetes	Intervention (joint management by medical staff + health promotion volunteers, online + offline guidance); Control (routine health management) (9 months)	Qualification rate of diet/exercise/ lifestyle, BMI, FBG, 2-hour postprandial blood glucose
Leung et al, 2020;[18] China; Mixed-Method Study	140	18–65 years old, overweight/obese	Community-based lifestyle modification program (individualized diet + exercise consultation, follow-up, self-monitoring) (10 months)	Diet/physical activity adherence scores, related psychological factors (knowledge, self-efficacy)
Michaud et al, 2017;[19] USA; Modeling Study	33,656	Males mean 53 years old, females mean 54 years old, overweight/obese	Weigh and Win community weight management program (12 months)	Lifetime incidence of coronary heart disease/stroke/type 2 diabetes, medical cost savings, ROI

(*Continued*)

Table 1 (Continued).

Study/Country/ Study Design	Sample Size	Population Age/ Disease	Intervention (Duration)	Main Outcome Indicators
Ni et al, 2020;[20] China; Quasi-Experiment (Intervention-Control Study)	697	≥40 years old, dyslipidemia combined with hypertension or diabetes	Intervention (joint management of dyslipidemia + hypertension/diabetes); Control (basic public health services) (1 year)	Dietary qualification rate, physical activity level, BMI, WC
Phillips et al, 2021;[21] Switzerland; Pragmatic RCT	54	≥18 years old, with at least 1 metabolic syndrome component	Intervention (12-hour time-restricted eating, TRE); Control (standard dietary advice, SDA) (6 months)	Weight, BMI, WC, blood pressure, lipids
Quintiliani et al, 2021;[22] USA; Two-group Randomized Trial	102	18–65 years old, overweight/obese	Intervention (motivational interviewing by community health workers, max 12 times + feedback report); Control (feedback report only) (3 months)	Weight, duration of moderate-intensity physical activity, fruit/ vegetable intake
Siu et al, 2021;[8] China; RCT	543	≥50 years old, central obesity	3 groups: Tai Chi (TC) group (24-form Yang-style Tai Chi); Conventional exercise (EX) group (aerobic + strength training); Control (no exercise) (12 weeks)	WC change, weight, BMI, lipids, blood glucose
Toon et al, 2024;[23] UK, Republic of Ireland; Service Evaluation (SE)	1,094,676	18–80 years old, obesity-related	Community weight management program (group meetings, digital support, behavior change guidance) (3/6/12-month outcomes)	Weight
Toon et al, 2024;[5] UK; Retrospective Longitudinal Study	27,560	18–80 years old, mainly obese	Community group intervention (12 weeks free, subsequent self-funded participation, behavior change guidance, online support) (12 weeks + optional continuation)	Weight
Wu et al, 2018;[24] China; Intervention Study (Self-Management Group)	52	18–70 years old, type 2 diabetes	90-day diet + exercise intervention (centralized training, group activities, follow-up guidance, tool distribution) (90 days)	FBG, glycated hemoglobin (HbA1c), body fat rate, systolic blood pressure, diet/exercise/sleep indicators
Xie et al, 2015;[25] China; RCT	412	35–80 years old, hypertension	Intervention (community health management, courses + consolidation, multi-dimensional guidance); Control (basic public health services) (6 months)	Health behaviors, self-management efficacy, blood pressure, WC, blood glucose, lipids

Note: RCT, Randomized Controlled Trial; BMI, Body Mass Index; ASCVD, Atherosclerotic Cardiovascular Disease; SBP, Systolic Blood Pressure; DBP, Diastolic Blood Pressure; CVH, Cardiovascular Health; OR, Odds Ratio; CI, Confidence Interval; ICER, Incremental Cost-Effectiveness Ratio; QALY, Quality-Adjusted Life Year; WC, Waist Circumference; FBG, Fasting Blood Glucose; HbA1c, Glycated Hemoglobin; TCM, Traditional Chinese Medicine; PDCA, Plan-Do-Check-Act; TRE, Time-Restricted Eating; and SDA, Standard Dietary Advice.

seven reported continuous outcome data suitable for pooled analysis (changes in body weight and/or BMI) and were included in the subsequent meta-analyses.

Meta-Analysis of Primary Outcomes

Effects on Body Weight Change

A meta-analysis of body weight change was performed, including four randomized controlled trials with a total of 641 participants (322 in intervention groups, 319 in control groups). Given the low heterogeneity observed ($I^2 = 25\%$; $Chi^2 = 3.98$, df = 3, P = 0.26), a fixed-effect model was applied. The pooled mean difference (MD) was −1.16 kg (95% CI: −3.19 to 0.86; Z = 1.13, P = 0.26), indicating no statistically significant difference in body weight reduction between the community-led intervention groups and the control groups overall (Figure 4). Among the individual studies, only one

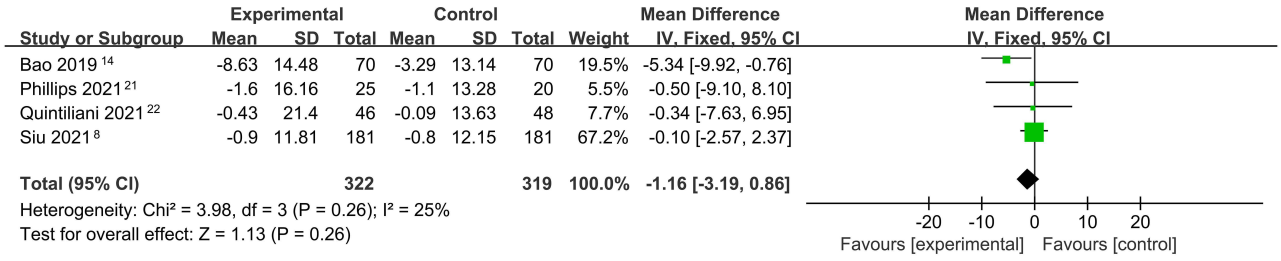

Figure 4 Forest plot of mean differences in body weight change following community-led weight management interventions.

trial[14] reported a statistically significant reduction in body weight, while the other three[8,21,22] showed no significant between-group differences.

Effects on Body Mass Index (BMI) Change

A meta-analysis of BMI change was performed using a random-effects model, which included six randomized controlled trials involving 1376 participants (694 in intervention groups and 682 in control groups). The pooled mean difference (MD) was –1.57 kg/m^2 (95% CI: –2.74 to –0.39; P = 0.009), indicating a statistically significant reduction in BMI favoring the community-led intervention groups (Figure 5). Substantial heterogeneity was observed across the studies (I^2 = 90%; Tau^2 = 1.80; Chi^2 = 48.28, df = 5, P < 0.00001), justifying the use of the random-effects model. While three individual trials[14,16,17] demonstrated statistically significant reductions in BMI, the remaining three[8,21,25] did not show significant between-group differences.

Qualitative Synthesis of Intervention Effects

Anthropometric and Cardiometabolic Risk Markers

Among the 15 studies included in the qualitative synthesis, 6 studies reported changes in key cardiometabolic risk markers and anthropometric indices beyond body weight and BMI.

Blood Pressure: Three studies reported quantified reductions in blood pressure. A PDCA-guided exercise intervention lowered systolic blood pressure from 130.47 ± 4.36 mmHg to 120.74 ± 4.42 mmHg and diastolic blood pressure from 81.70±3.58 mmHg to 74.49 ± 2.77 mmHg in adults with prehypertension.[16] A community health management model reduced systolic blood pressure from 138.8 ± 14.4 mmHg to 125.5 ± 6.8 mmHg in patients with hypertension.[25] The same study reported diastolic blood pressure decreased from 86.6 ± 9.8 mmHg to 81.2 ± 6.1 mmHg in the intervention group.[25]

Glycemic Control: Three studies demonstrated quantified improvements in glucose metabolism. A joint management program for prediabetes reduced fasting blood glucose from 6.67±0.69 mmol/L to 5.85±0.91 mmol/L and 2-hour postprandial blood glucose from 9.95±2.04 mmol/L to 7.08±1.19 mmol/L.[17] A diet-exercise intervention in patients with type 2 diabetes lowered HbA1c from 7.9±1.5% to 6.6±1.0% and fasting blood glucose from 8.8±2.6 mmol/L to 7.7

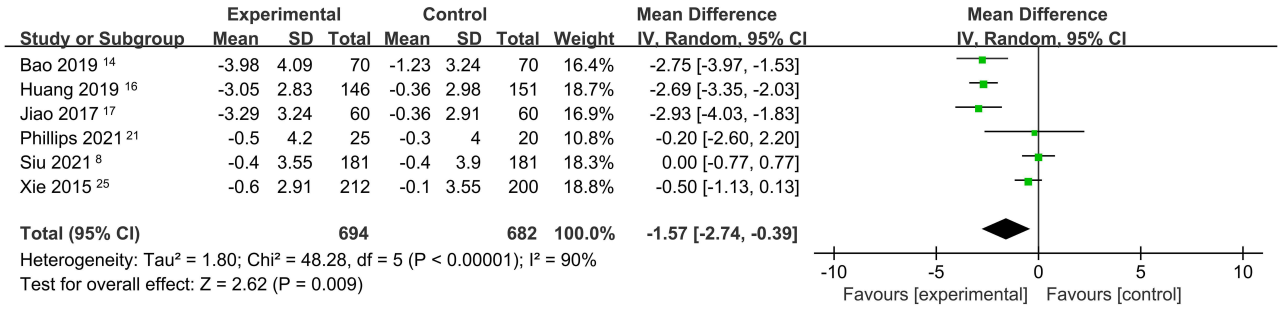

Figure 5 Forest plot of mean differences in Body Mass Index (BMI) change following community-led weight management interventions.

±2.6 mmol/L.[24] The PDCA-guided intervention also reported a reduction in fasting blood glucose from 4.97±1.01 mmol/L to 4.64±0.77 mmol/L.[16]

Blood Lipids: Two studies reported quantified positive changes in lipid profiles. The PDCA-guided intervention significantly reduced total cholesterol from 4.94±0.91 mmol/L to 4.47±0.80 mmol/L, and triglycerides from 1.82 ±1.18 mmol/L to 1.52±0.75 mmol/L, while increasing HDL-C from 1.21±0.28 mmol/L to 1.38±0.25 mmol/L.[16] The community health management model also reported reductions in total cholesterol from 5.8±1.2 mmol/L to 4.5 ±0.9 mmol/L and triglycerides from 2.1±1.5 mmol/L to 1.6±0.8 mmol/L.[25]

Waist Circumference: Three studies reported quantified reductions in waist circumference. An integrated management program for dyslipidemia patients with comorbidities reduced waist circumference from 86.73 cm to 85.20 cm (a reduction of 1.53 cm) in the hypertension subgroup.[20] A Tai Chi intervention reduced waist circumference by 4.3 cm after 38 weeks, from a baseline of approximately 92 cm.[8] The PDCA-guided intervention also reported a decrease in waist circumference, although specific baseline and follow-up values were not provided in the extracted summary.[16]

Behavioral and Psychosocial Outcomes

Quantified data on behavioral and psychosocial outcomes were available from 4 studies.

Health Behavior Change: Three studies reported specific changes in daily health behaviors. In a community telewellness RCT, participation was associated with a 23.7% reduction in the probability of physical inactivity.[13] A motivational interviewing intervention delivered by community health workers increased participants' moderate-intensity physical activity by 11.7 minutes per day and fruit/vegetable intake by 2.3 servings per day.[22] In a Chinese community study, participants' adherence scores for diet and physical activity after intervention were 18.83 ± 6.05 and 3.65 ± 2.13 on their respective scales.[18]

Psychosocial and Cognitive Factors: One study measured specific psychological predictors of behavior change. The mixed-methods study by Leung et al identified that increases in nutrition knowledge and self-efficacy were significant predictors of better dietary and physical activity adherence.[18]

Quality of Life (QoL): One study assessed QoL using the SF-36 scale. After a 6-month intervention integrating Traditional Chinese Medicine with community management, the intervention group reported higher scores in specific domains compared to the control group: physical functioning (96.83 ± 4.31 vs 92.58 ± 6.54), role-physical (93.91 ± 12.18 vs 87.00 ± 16.44), and mental health (80.67 ± 13.01 vs 67.03 ± 15.24).[14]

Outcomes in Specific High-Risk or Clinical Populations

A total of 4 studies or service evaluations reported outcomes for specific high-risk or clinically identified populations.

Adults with Cardiometabolic Comorbidities: One quasi-experimental study evaluated an integrated management program for dyslipidemia patients with hypertension or diabetes.[20] The intervention significantly increased moderate-intensity physical activity (eg, by 828.2 MET-min/week in the hypertension subgroup), reduced BMI (eg, by 1.075 kg/m^2 in the hypertension subgroup), and decreased waist circumference (eg, by 2.796 cm in the hypertension subgroup).

Adults with Central Obesity: One RCT evaluated the effect of Tai Chi in adults aged 50 years or older with central obesity.[8] The intervention reduced waist circumference by 1.8 cm at 12 weeks and sustained a reduction of 4.3 cm at 38 weeks, achieving effects comparable to conventional exercise. The Tai Chi group also showed an increase in HDL-C levels of 0.10 mmol/L relative to the control group at 38 weeks.

Clinically Referred Populations in Real-World Settings: One large-scale service evaluation of a UK community weight management program reported outcomes for over 27,000 adults referred from primary care.[23] Participants achieved a mean weight reduction of 7.3% at 24 months. Subgroup analysis indicated that high attenders (defined as attending ≥41 sessions) achieved a mean weight reduction of 15.3% at 12 months.

International Evidence and Health Economic Evaluations

Four international studies contributed data on comparative effectiveness or economic evaluations.

Comparative Effectiveness in International Settings: One pragmatic RCT conducted in Switzerland compared time-restricted eating (TRE) with standard dietary advice (SDA) in adults with at least one component of metabolic syndrome.[21] At 6 months, the TRE group reduced their body weight by 1.6% ± 2.9%, while the SDA group reduced

by 1.1% ± 3.5%, with no statistically significant difference between groups (P = 0.43). One large-scale service evaluation in the UK assessed a commercially available community program among self-funded adults.[5] Participants (n = 1,094,676) achieved an average weight reduction of 6.0% ± 5.8% at 12 months. A subgroup defined by high attendance (≥75% of sessions) achieved a mean weight reduction of 14.1% ± 7.5% at 12 months.

Health Economic Evaluations: Two studies conducted economic evaluations from a payer perspective. A US modeling study based on the "Weigh and Win" program projected that the intervention could avoid 78 cases of coronary heart disease, 92 cases of type 2 diabetes, and 9 strokes per 33,656 participants over a lifetime horizon, with an estimated return on investment of $16.7 for every $1 invested.[19] A cost-effectiveness analysis of a US community telewellness program (Koa Family Program) calculated an incremental cost-effectiveness ratio (ICER) of $73 per additional pound of weight loss over 25 weeks. The probability of the program being cost-effective was 90% at a willingness-to-pay threshold of $115 per pound.[15]

Discussion

This systematic review and meta-analysis provides a timely synthesis of evidence on community-led weight management interventions within the strategic context of China's "Weight Management Year" (2024–2026). Our meta-analysis of six RCTs (n = 1376) demonstrated a statistically significant reduction in BMI (MD: −1.57 kg/m^2, 95% CI: −2.74 to −0.39), offering quantitative support for the policy's core hypothesis. Alongside this, the qualitative synthesis revealed consistent, clinically meaningful improvements across a spectrum of cardiometabolic risk markers and health behaviors. These findings collectively affirm that communities, when strategically activated, are viable and effective platforms for translating national health strategies into local practice.

The policy's emphasis on leveraging existing frontline infrastructure is strongly supported by evidence of effectiveness from integrated care models. Our review found that interventions which formally embedded weight management into the existing roles of community health actors yielded significant benefits. For instance, the joint management of prediabetic patients by medical staff and health promotion volunteers led to a reduction in fasting blood glucose by 0.82 mmol/L and 2-hour postprandial blood glucose by 2.87 mmol/L, alongside a decrease in BMI.[17] Similarly, an integrated management program for patients with dyslipidemia and hypertension or diabetes increased moderate-intensity physical activity by over 800 MET-min/week and reduced BMI by up to 1.075 kg/m^2.[20] These results validate the policy's approach of empowering village doctors and community health teams as first-line agents for preventive care, moving beyond siloed programs towards a coordinated chronic disease management model.

Digital health tools and remote support mechanisms emerge as critical force multipliers, addressing scalability and accessibility challenges inherent in a vast nation. The integration of artificial intelligence and machine learning in medical informatics holds great potential for enhancing the precision and personalization of such interventions,[26] particularly in predicting health outcomes and optimizing resource allocation in community settings. The positive outcomes associated with technology-enhanced interventions provide a roadmap for policy implementation. The large-scale service evaluation of a digital-supported community program[5] demonstrated an average 6.0% weight loss at 12 months among over a million participants, showcasing potential for massive reach. Furthermore, the village doctor-led mobile health intervention specifically reduced atherosclerotic cardiovascular disease risk in a rural population,[27] directly addressing urban-rural health disparities. The dose-response relationship observed in the Koa Family Program, where each additional telewellness session attended resulted in an extra 0.85 lb weight loss,[13] underscores the utility of digital platforms for maintaining engagement. For the "Weight Management Year", investing in secure, user-friendly digital platforms for provider training, patient self-monitoring, and remote consultation is not optional but essential for fidelity and scale.

The principle of cultural adaptation, central to the policy's call for "localized implementation", is empirically substantiated by superior outcomes of context-sensitive interventions. Our review identifies specific models where deep cultural integration predicted success. Tai Chi, a culturally familiar mind-body exercise, was as effective as conventional aerobic and strength training in reducing waist circumference (−4.3 cm at 38 weeks) and showed a more sustained improvement in HDL-C levels.[8] Similarly, an intervention incorporating Traditional Chinese Medicine health preservation principles with community management not only reduced weight but also significantly improved quality-of-

life scores (SF-36) compared to routine care.[14] These findings argue against the direct transplantation of Western models and instead support the policy's direction of fostering innovation that resonates with local dietary habits, physical activity traditions, and health beliefs.

Beyond anthropometrics, the reviewed interventions produced broad-spectrum health benefits, aligning with the holistic goals of "Healthy China 2030". The policy's success should not be measured by weight loss alone but by overall health gain. Our synthesis confirms this broader impact: PDCA-guided exercise lowered systolic/diastolic blood pressure from 130.5/81.7 mmHg to 120.7/74.5 mmHg in prehypertensive adults,[16] and a community health management model reduced systolic blood pressure from 138.8 to 125.5 mmHg in hypertensive patients.[25] A diet-exercise intervention for type 2 diabetes patients lowered HbA1c from 7.9% to 6.6%.[24] Beyond lifestyle modifications, emerging pharmacological strategies such as linagliptin have also shown potential in managing cardiometabolic risks through integrated bioinformatics approaches,[28] suggesting that community programs could benefit from incorporating evidence-based pharmacotherapeutic guidance where appropriate. Furthermore, interventions improved psychosocial determinants; for example, they enhanced nutrition knowledge, self-efficacy, and increased moderate-intensity physical activity by 11.7 minutes per day.[18,22] This multifaceted effectiveness underscores that community-led weight management can be a potent entry point for comprehensive non-communicable disease prevention.

Despite promising evidence, critical gaps in longevity, equity, and economic data must be addressed to ensure sustainable and equitable policy scaling. The average follow-up in most included studies is short to medium term, leaving the durability of benefits uncertain. While one study showed weight loss maintenance at 24 months,[23] long-term data within China's specific context is scarce. Furthermore, although some studies included low-income populations,[13,22] systematic analysis of socioeconomic equity in intervention access and outcomes remains limited. Most critically, as highlighted in our results, there is a severe scarcity of cost-effectiveness analyses conducted within China's healthcare financing framework. International studies suggest potential cost savings,[15,19] but localized health economic evidence is imperative for policymakers to make informed investments and design sustainable financing mechanisms, such as performance-based subsidies or insurance coverage for preventive services.

Realizing the policy's potential, therefore, requires navigating critical implementation challenges alongside scaling proven models. While evidence supports the efficacy of community-led approaches, their translation into a nationwide, sustainable system demands addressing key hurdles. The scarcity of long-term effectiveness data within China raises questions about durability of benefits beyond the short-term campaign period. More critically, the almost complete absence of local cost-effectiveness analyses creates a significant barrier for policymakers tasked with allocating finite resources across competing priorities. The policy's success will depend not only on replicating effective interventions but also on generating robust, context-specific evidence on their long-term impact and economic value to inform sustainable financing mechanisms, such as performance-based subsidies or insurance coverage for preventive services.

Limitations

This review has several limitations. First, there was substantial heterogeneity ($I^2 = 90\%$) in the BMI meta-analysis. While this is expected given the diversity of community interventions and indicates that the pooled effect estimate should be interpreted as an average effect across varying contexts rather than a single homogeneous effect, our ability to explore specific sources of this heterogeneity (eg, intervention intensity, cultural context) through subgroup analyses was constrained by the limited number of studies. However, the use of a random-effects model partially accounted for this variability, and the qualitative synthesis showed a consistent direction of improvement in other health indicators aligned with the BMI findings, which strengthens the credibility of the main results to some extent. Second, the inherent risk of performance bias in behavioral trials (inability to blind participants and personnel) may lead to an overestimation of effect sizes. This is indeed a common methodological challenge in this field of research. It is noteworthy, however, that most of the included studies demonstrated robust methodologies in other key areas, such as randomization, outcome measurement (using objective biomarkers like body weight and blood pressure), and statistical analysis (eg, employing intention-to-treat analysis), which helps mitigate the impact of this bias on the primary objective outcomes. Third, as noted in the discussion, our synthesis is constrained by the evidence gaps in the primary literature, particularly the lack of long-term follow-up and local economic evaluations. Fourth, due to the small number of studies included in each meta-

analysis (n=4 for body weight; n=6 for BMI), we did not perform statistical tests or create funnel plots to assess publication bias, as the power of such methods is generally too low to provide meaningful interpretation with fewer than 10 studies.[29] Finally, while we searched major Chinese and English databases, unpublished or non-indexed local studies may have been missed.

Conclusion

In conclusion, this review substantiates the strategic premise of China's "Weight Management Year" by demonstrating that community-led interventions can effectively improve weight status and cardiometabolic health. The evidence highlights successful pathways involving frontline health workers, digital tools, and cultural adaptation. To transform this promise into a lasting public health achievement, it is imperative to systematically embed these approaches within the primary healthcare and community governance fabric, supported by concrete measures such as incorporating intervention outcomes into the performance evaluation of grassroots health workers and establishing integrated digital health platforms for monitoring and support. This necessitates committed investment in both implementation (financing, workforce training) and knowledge generation (long-term and economic research). Through such integrated efforts, the initiative can evolve from a focused campaign into a sustainable cornerstone of "Healthy China 2030", enabling effective obesity prevention at the population level.

Disclosure

The author reports no conflicts of interest in this work.

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