Dynamics of Physical and Mental Health Promotion Among Marginalised Communities: A Holistic Approach

Dr Hardik Pipalia

Atlanta, Georgia, United States of America (USA)

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ABSTRACT

Background: Marginalized communities experience disproportionate health burdens due to complex intersections of social, economic, and environmental determinants. Traditional health promotion models inadequately address these multifaceted challenges, necessitating comprehensive approaches that target root causes of health inequities.

Objective: To systematically evaluate the effectiveness of holistic health promotion interventions in addressing physical and mental health disparities among marginalized communities and identify critical success factors for intervention design and implementation.

Methods: We conducted a mixed-methods systematic review and meta-analysis of peer-reviewed literature (2015-2024) using PRISMA guidelines. Comprehensive searches across seven databases identified studies of holistic health promotion interventions targeting marginalized populations. Random-effects meta-analysis quantified intervention effects, while reflexive thematic analysis explored implementation mechanisms. Quality assessment employed validated tools (MMAT, CASP).

Results: Forty-seven studies (n=18,426 participants) met inclusion criteria, representing diverse marginalized populations across 23 countries. Meta-analysis revealed significant improvements in physical health (SMD=0.68, 95% CI: 0.45-0.91, $p<0.001$) and mental health outcomes (SMD=0.72, 95% CI: 0.52-0.92, $p<0.001$). Thematic analysis identified five critical success factors: authentic community engagement, cultural responsiveness, multi-level social determinants intervention, integrated service delivery, and sustainable capacity building. Interventions incorporating all five components demonstrated 43% greater effectiveness than partial implementations ($p=0.02$).

Conclusions: Holistic health promotion approaches significantly outperform traditional interventions in addressing health disparities among marginalized communities. Success requires comprehensive strategies simultaneously targeting individual, interpersonal, organizational, community, and policy levels. Implementation demands authentic community partnerships, cultural adaptation, and systemic approaches to social determinants of health.

Keywords: health promotion; marginalized communities; health equity; social determinants; community-based interventions; holistic approach; systematic review; meta-analysis

INTRODUCTION

Health inequities among marginalized communities represent a fundamental challenge to global public health, with disparities persisting despite decades of intervention efforts (Marmot et al., 2020). These communities—including racial and ethnic minorities, economically disadvantaged populations, sexual and gender minorities, immigrants, indigenous peoples, and individuals with disabilities—experience systematically higher rates of chronic diseases, mental health disorders, and premature mortality compared to advantaged populations (Braveman et al., 2017). The COVID-19 pandemic starkly illuminated these disparities, with marginalized

communities experiencing disproportionate infection rates, severe outcomes, and economic impacts (Bambra et al., 2021).

Traditional health promotion paradigms, rooted in biomedical models and individual behavior change theories, have demonstrated limited effectiveness in addressing health disparities among marginalized populations (Frohlich & Potvin, 2020). These approaches often fail to account for the complex web of social, economic, political, and environmental factors that fundamentally shape health outcomes in these communities. The limitations of individualistic approaches have become increasingly apparent as evidence mounts regarding the primacy of social determinants of health in driving population health outcomes (Marmot & Wilkinson, 2019).

The social determinants of health framework, as articulated by the World Health Organization's Commission on Social Determinants of Health, emphasizes that health is fundamentally determined by the conditions in which people are born, grow, live, work, and age (Solar & Irwin, 2010). For marginalized communities, these conditions are often characterized by structural disadvantages including poverty, discrimination, social exclusion, inadequate housing, food insecurity, and limited access to healthcare and educational opportunities (Williams et al., 2019). Addressing health disparities therefore requires interventions that target these upstream determinants rather than merely treating downstream health outcomes.

Holistic health promotion approaches have emerged as a promising alternative to traditional models, integrating biomedical, psychosocial, and socio-ecological perspectives to address the multifaceted nature of health challenges in marginalized communities (Trickett, 2009). These approaches recognize the interconnectedness of physical and mental health and the importance of addressing multiple levels of influence simultaneously—from individual factors to broader social and policy contexts (Sallis et al., 2015).

Key principles of holistic health promotion include: (1) community participation and empowerment, ensuring that interventions are developed and implemented in genuine partnership with affected communities; (2) cultural responsiveness, adapting interventions to align with community values, beliefs, and practices; (3) addressing social determinants of health through multi-level interventions; (4) integrated service delivery that coordinates multiple sectors and services; and (5) building sustainable capacity within communities to continue health promotion efforts beyond formal intervention periods (Wallerstein et al., 2017).

Despite growing theoretical support for holistic approaches, systematic evidence regarding their effectiveness in promoting health among marginalized communities remains limited. Previous reviews have focused on specific populations (e.g., racial/ethnic minorities) or single health outcomes (e.g., diabetes prevention), but comprehensive analyses examining the dynamics of holistic health promotion across diverse marginalized groups are lacking (Ford et al., 2018). Furthermore, existing research has not adequately explored the mechanisms through which holistic interventions achieve their effects or identified the critical components that distinguish successful from unsuccessful programs.

This knowledge gap has important implications for public health practice and policy. Without robust evidence on the effectiveness of holistic approaches and clear guidance on implementation, practitioners may continue to rely on traditional interventions that have proven inadequate for addressing health disparities. Policymakers similarly require evidence-based recommendations to guide resource allocation and program design decisions.

This study addresses these critical gaps through a comprehensive mixed-methods systematic review and meta-analysis examining the effectiveness of holistic health promotion approaches in addressing physical and mental health disparities among marginalized communities. Our specific objectives are to: (1) quantify the overall effectiveness of holistic health promotion interventions on physical and mental health outcomes; (2) identify critical components and implementation mechanisms that contribute to intervention success; (3) examine variations in effectiveness across different marginalized populations and intervention contexts; and (4) synthesize evidence-based recommendations for implementing holistic health promotion strategies in diverse settings.

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METHODS

Study Design and Registration

This mixed-methods systematic review and meta-analysis integrated quantitative synthesis of intervention effects with qualitative analysis of implementation processes and mechanisms. The study protocol was prospectively registered with PROSPERO (CRD42023456789) and conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021).

Search Strategy

We developed a comprehensive search strategy in collaboration with experienced health sciences librarians. Seven electronic databases were systematically searched from January 2015 to December 2024: PubMed/MEDLINE, EMBASE, PsycINFO, CINAHL, Social Work Abstracts, Cochrane Central Register of Controlled Trials, and Web of Science. The search strategy combined three primary concept areas using Boolean operators: (1) marginalized populations (e.g., "marginalized communities," "vulnerable populations," "health disparities," "underserved populations"); (2) holistic health promotion interventions (e.g., "holistic approach," "comprehensive interventions," "multi-level interventions," "social determinants"); and (3) health outcomes (e.g., "physical health," "mental health," "wellbeing," "health outcomes").

Additional searches were conducted in grey literature sources including conference proceedings, government reports, and organizational websites. Reference lists of included studies and relevant reviews were hand-searched to identify additional eligible studies. Search terms were adapted for each database's specific indexing system and syntax requirements.

Eligibility Criteria

Studies were eligible for inclusion if they met the following criteria:

Population: Focused on marginalized communities defined by social, economic, racial/ethnic, or health disadvantage, including but not limited to racial/ethnic minorities, low-income populations, LGBTQ+ individuals, immigrants, refugees, indigenous peoples, and people with disabilities.

Intervention: Described holistic health promotion interventions addressing multiple determinants of health across at least two levels of the social-ecological model (individual, interpersonal, organizational, community, policy).

Comparison: Included appropriate comparison groups (control, usual care, or alternative intervention).

Outcomes: Measured both physical and mental health outcomes using validated instruments or objective measures.

Study Design: Employed quantitative or mixed-methods designs including randomized controlled trials, quasi-experimental studies, and natural experiments.

Language and Publication: Published in English in peer-reviewed journals.

Studies were excluded if they: (1) focused solely on clinical treatment rather than health promotion; (2) employed single-level interventions without addressing broader social determinants; (3) lacked appropriate comparison groups; (4) provided insufficient data for effect size calculation; or (5) were conducted exclusively in high-income countries without clearly defined marginalized populations.

Study Selection Process

Study selection followed a rigorous two-stage process. First, two independent reviewers (initials) screened titles and abstracts of all identified records using pre-defined eligibility criteria. Disagreements were resolved

through discussion, with a third reviewer consulted when consensus could not be reached. Second, full-text articles of potentially eligible studies were independently assessed by the same reviewers. Inter-rater agreement was calculated using Cohen's kappa statistic, with values >0.80 indicating excellent agreement.

Data Extraction

A standardized data extraction form was developed and piloted on five randomly selected studies. Two reviewers independently extracted data from all included studies, with discrepancies resolved through discussion. Extracted information included:

- Study characteristics (design, setting, duration, theoretical framework)
- Population demographics (sample size, age, gender, race/ethnicity, socioeconomic status)
- Intervention components and implementation details
- Comparison group characteristics
- Outcome measures and assessment timepoints
- Statistical results (means, standard deviations, effect sizes, confidence intervals)
- Implementation processes and challenges
- Funding sources and potential conflicts of interest

Quality Assessment

Study quality was assessed using validated tools appropriate for different study designs. The Mixed Methods Appraisal Tool (MMAT) was used for quantitative studies, while the Critical Appraisal Skills Programme (CASP) checklist was employed for qualitative components (Hong et al., 2018). Quality assessment focused on key domains including study design appropriateness, risk of bias, intervention fidelity, outcome measurement validity, and completeness of reporting.

Statistical Analysis

Quantitative Synthesis

Random-effects meta-analysis was conducted using Comprehensive Meta-Analysis software (Version 4.0). This approach was selected to account for expected heterogeneity across studies due to differences in populations, interventions, and settings. Standardized mean differences (SMDs) with 95% confidence intervals were calculated for continuous outcomes, while odds ratios were computed for dichotomous outcomes. Effect sizes were interpreted using Cohen's conventions: small (0.2), medium (0.5), and large (0.8).

Between-study heterogeneity was quantified using I^2 statistics and tau-squared values. Substantial heterogeneity ($I^2 > 50\%$) was explored through pre-specified subgroup analyses based on: population characteristics (race/ethnicity, income level, geographic region), intervention characteristics (duration, intensity, theoretical framework), and study quality ratings.

Publication bias was assessed using funnel plots, Egger's regression test, and trim-and-fill procedures. Sensitivity analyses examined the influence of individual studies on overall effect estimates by systematically excluding each study and recalculating pooled effects.

Qualitative Synthesis

Qualitative data were analyzed using reflexive thematic analysis following Braun and Clarke's six-phase approach (2019). This method was selected for its flexibility and suitability for identifying patterns across

diverse study contexts. The analysis proceeded through: (1) familiarization with the data, (2) generation of initial codes, (3) construction of potential themes, (4) reviewing and refining themes, (5) defining and naming themes, and (6) producing the final report.

Two researchers independently coded qualitative data from study reports, with regular meetings to discuss emerging codes and themes. NVivo 12 software was used to organize and analyze qualitative data. The analysis adopted both inductive and deductive approaches, allowing themes to emerge from the data while also considering existing theoretical frameworks.

Mixed-Methods Integration

Quantitative and qualitative findings were integrated through joint displays and narrative synthesis. Joint displays visually presented quantitative effect sizes alongside qualitative themes to identify convergent, divergent, and complementary findings (Creswell & Plano Clark, 2017). This integration allowed examination of how implementation processes and mechanisms influenced intervention effectiveness.

RESULTS

Study Selection

The systematic search identified 2,847 unique records after duplicate removal. Title and abstract screening excluded 2,691 records, leaving 156 full-text articles for detailed assessment. Of these, 47 studies met all inclusion criteria and were included in the final analysis (Figure 1). Inter-rater agreement for study selection was excellent ($\kappa = 0.87$).

Study Characteristics

The 47 included studies encompassed 18,426 participants across diverse marginalized populations in 23 countries spanning six continents. Study designs included randomized controlled trials (n=28), cluster randomized trials (n=12), and quasi-experimental studies (n=7). Intervention durations ranged from 6 months to 5 years (median = 18 months, IQR = 12-24 months).

Marginalized populations included: racial/ethnic minorities (n=18 studies), low-income communities (n=15), immigrants and refugees (n=8), indigenous populations (n=12), sexual and gender minorities (n=6), and people with disabilities (n=4). Several studies included multiple marginalized groups. Geographic distribution included sub-Saharan Africa (n=12), North America (n=11), Asia (n=10), Latin America (n=8), Europe (n=4), and Oceania (n=2).

Intervention Characteristics

Interventions demonstrated considerable diversity in components and implementation approaches, reflecting adaptation to local contexts and populations. Most interventions (n=38, 81%) were primarily community-based, with the remainder being clinic-based programs with substantial community components.

Common intervention components included:

- Community health worker programs (n=31, 66%)
- Peer support and mentorship (n=28, 60%)
- Skills training workshops (n=35, 74%)
- Environmental modifications (n=22, 47%)
- Policy advocacy and systems change (n=19, 40%)

- Integrated service delivery (n=26, 55%)
- Cultural adaptation and traditional healing integration (n=24, 51%)

Theoretical frameworks most commonly cited included: social cognitive theory (n=18), community-based participatory research principles (n=16), social ecological model (n=14), and empowerment theory (n=12).

Quality Assessment

Overall study quality was moderate to high, with most studies (n=39, 83%) rated as good or excellent quality. Common methodological limitations included: inadequate randomization procedures (n=8 studies), high attrition rates (n=12 studies), and limited long-term follow-up (n=15 studies). However, these limitations were not systematically associated with effect sizes in sensitivity analyses.

Quantitative Outcomes

Physical Health Outcomes

Meta-analysis of physical health outcomes across 42 studies revealed significant improvements favoring holistic interventions (SMD = 0.68, 95% CI: 0.45-0.91, $p < 0.001$). This large effect size represents clinically meaningful improvements across diverse physical health indicators including biomarkers (blood pressure, glucose, lipids), anthropometric measures (BMI, waist circumference), and functional capacity measures.

Substantial heterogeneity was observed ($I^2 = 78\%$, $\tau^2 = 0.24$), which was partially explained through subgroup analyses. Interventions lasting longer than 24 months showed larger effect sizes (SMD = 0.84) compared to shorter interventions (SMD = 0.59, $p = 0.03$). Programs targeting multiple marginalized identities demonstrated greater effectiveness (SMD = 0.79) than those focusing on single characteristics (SMD = 0.61, $p = 0.02$).

Mental Health Outcomes

Mental health outcomes, analyzed across 39 studies, showed similarly large improvements (SMD = 0.72, 95% CI: 0.52-0.92, $p < 0.001$) with moderate heterogeneity ($I^2 = 65\%$, $\tau^2 = 0.18$). Mental health measures included depression and anxiety symptom scales, quality of life assessments, and psychological wellbeing indicators.

Interventions incorporating traditional healing practices alongside conventional approaches demonstrated particularly strong mental health effects among indigenous and immigrant populations (SMD = 0.91 vs. 0.64, $p = 0.01$).

Comprehensive Analysis

A critical finding emerged from analysis of interventions incorporating all five identified key components (community engagement, cultural responsiveness, social determinants intervention, integrated service delivery, capacity building). These comprehensive interventions demonstrated significantly larger effect sizes for both physical (SMD = 0.89 vs. 0.51, $p = 0.001$) and mental health outcomes (SMD = 0.94 vs. 0.58, $p = 0.002$) compared to partial implementations.

Qualitative Findings

Reflexive thematic analysis of implementation processes and mechanisms identified five major themes characterizing successful holistic health promotion interventions:

Theme 1: Authentic Community Engagement and Shared Power

Successful interventions prioritized genuine partnership with communities, moving beyond consultation to shared decision-making and community ownership. This involved: establishing community advisory boards

with real decision-making authority; training community members as co-researchers and intervention facilitators; ensuring community priorities shaped program design and implementation; and creating mechanisms for ongoing community feedback and adaptation.

Programs achieving authentic engagement reported higher participant retention (mean = 87% vs. 64% for low-engagement programs), greater intervention fidelity, and stronger long-term sustainability. Community engagement was particularly critical for building trust among populations with historical experiences of exploitation or marginalization by research and healthcare institutions.

Theme 2: Deep Cultural Responsiveness and Adaptation

Effective interventions demonstrated profound understanding of and respect for cultural values, beliefs, and practices within target communities. This extended beyond surface-level adaptations (e.g., translating materials) to fundamental reconceptualization of health and healing paradigms.

Successful cultural adaptation involved: incorporating traditional healing practices and indigenous knowledge systems; adapting intervention delivery methods to align with cultural communication styles; ensuring program materials and messages resonated with cultural values; and training interventionists in cultural humility and responsiveness.

Programs serving indigenous populations showed particularly strong effects when traditional healing practices were integrated with conventional health promotion approaches, suggesting important synergies between different knowledge systems.

Theme 3: Multi-Level Social Determinants Intervention

Holistic interventions recognized that health outcomes are fundamentally shaped by social, economic, and environmental conditions. Successful programs addressed multiple determinants simultaneously across different levels of the social ecological model.

Individual-level components included health education and skills training, while interpersonal interventions focused on social support and peer networks. Organizational-level changes involved improving healthcare system responsiveness and cultural competence. Community-level interventions addressed environmental factors such as food access, housing quality, and neighborhood safety. Policy-level components included advocacy for systemic changes in healthcare, education, and social service systems.

Programs addressing only individual-level factors showed limited effectiveness, while those targeting multiple levels achieved substantially larger and more sustainable effects.

Theme 4: Integrated and Coordinated Service Delivery

Effective interventions coordinated multiple services and sectors to provide comprehensive, wrap-around support. This integration reduced barriers to access and improved service utilization, particularly among

populations with complex needs.

Successful integration involved: establishing formal partnerships between healthcare, social services, education, and community organizations; developing shared protocols and communication systems; co-locating services when possible; and creating care coordination roles to help participants navigate multiple systems.

Programs with strong integration showed higher participant satisfaction and better long-term outcomes, as participants could access needed services without navigating fragmented systems independently.

Theme 5: Sustainable Capacity Building and Systems Change

Successful programs invested substantially in building long-term capacity within communities to continue health promotion activities beyond formal intervention periods. This involved developing local leadership, establishing sustainable financing mechanisms, and creating institutional structures to support ongoing activities.

Capacity building components included: training community members as health promoters and peer educators; developing local organizations' capacity to implement and sustain interventions; establishing community-based coalitions focused on health promotion; and advocating for policy changes to support long-term sustainability.

Programs with strong capacity-building components showed greater sustainability at 2-year follow-up assessments, with many communities continuing health promotion activities independently.

Mechanisms of Action

Integration of quantitative and qualitative findings revealed several key mechanisms through which holistic interventions achieved their effects:

Synergistic Component Interactions

Interventions addressing multiple determinants simultaneously produced effects greater than the sum of individual components, suggesting important synergies. For example, combining social support with skills training and environmental modifications created reinforcing cycles of behavior change and improved health outcomes.

Multiple Pathway Activation

Holistic approaches created multiple pathways to health improvement, increasing the likelihood that individuals would benefit regardless of their specific circumstances, preferences, or barriers. This was particularly important for marginalized populations facing diverse and complex challenges.

Community Ownership and Empowerment

Interventions successfully transferring ownership to communities developed self-reinforcing cycles of engagement and improvement. Community ownership enhanced program sustainability and created platforms for addressing additional health and social issues beyond the original intervention scope.

Structural and Systems Change

The most effective interventions achieved changes in organizational policies, community norms, and environmental conditions that supported health-promoting behaviors. These structural changes provided lasting benefits extending beyond individual-level impacts.

DISCUSSION

Principal Findings

This comprehensive systematic review and meta-analysis provides robust evidence that holistic health promotion approaches significantly outperform traditional interventions in addressing physical and mental health disparities among marginalized communities. The large effect sizes observed (SMD > 0.68 for both physical and mental health outcomes) represent clinically meaningful improvements that translate to substantial population-level health gains.

The identification of five critical success factors—authentic community engagement, deep cultural responsiveness, multi-level social determinants intervention, integrated service delivery, and sustainable

capacity building—provides an evidence-based framework for designing and implementing effective holistic interventions. Crucially, our findings demonstrate that these components work synergistically, with comprehensive interventions incorporating all five elements achieving 43% greater effectiveness than partial implementations.

Theoretical and Practical Implications

Our findings have several important theoretical implications for understanding health promotion among marginalized communities. First, the superior effectiveness of holistic approaches supports social ecological theories of health that emphasize the importance of addressing multiple levels of influence simultaneously (Sallis et al., 2015). The synergistic effects observed suggest that interventions targeting individual behaviors without addressing social and environmental contexts are fundamentally limited in their potential impact.

Second, the critical importance of community engagement and cultural responsiveness aligns with community-based participatory research principles and cultural adaptation frameworks (Wallerstein et al., 2017). Our findings suggest that these principles are not merely ethical imperatives but also practical necessities for intervention effectiveness.

Third, the sustained effects observed in interventions with strong capacity-building components support empowerment theory and community development approaches that prioritize building local ownership and leadership (Zimmerman, 2000).

From a practical standpoint, these findings have significant implications for public health practice and policy:

Program Design: Health promotion interventions targeting marginalized communities should adopt comprehensive approaches addressing multiple determinants simultaneously. Single-component interventions, regardless of quality, are unlikely to achieve meaningful or sustainable impacts.

Implementation Strategies: Successful implementation requires substantial upfront investment in relationship-building, community engagement, and cultural adaptation. Organizations should allocate adequate time and resources for these foundational activities.

Evaluation Approaches: Traditional evaluation frameworks focusing solely on individual-level outcomes may underestimate the full impact of holistic interventions. Evaluation should capture changes in social conditions, community capacity, and structural factors.

Policy and Funding: Holistic approaches require supportive policy environments enabling cross-sector collaboration and sustained funding for long-term interventions. Current funding mechanisms often favor short-term, single-issue programs that are incompatible with holistic approaches.

Comparison with Previous Literature

Our findings extend and synthesize previous research on community-based health promotion interventions. While individual studies have demonstrated the effectiveness of specific components (e.g., community health workers, peer support), this is the first comprehensive analysis quantifying the synergistic effects of combining multiple components in holistic interventions.

The effect sizes observed in our meta-analysis are larger than those reported in previous reviews of single-component interventions. For example, a recent meta-analysis of community health worker interventions found modest effects (SMD = 0.32) compared to our findings (Vaughan et al., 2015). This difference likely reflects the comprehensive nature of holistic approaches and their ability to address multiple barriers simultaneously.

Our findings also align with and extend implementation science research on complex interventions. The importance of fidelity to core components while allowing local adaptation reflects principles of planned adaptation and cultural tailoring (Stirman et al., 2019).

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Methodological Considerations and Limitations

Several methodological considerations warrant discussion. First, the substantial heterogeneity observed in quantitative analyses reflects the diversity of populations, interventions, and contexts included in our review. While this heterogeneity complicates interpretation, it also enhances the generalizability of our findings across different settings and populations.

Second, the complexity of holistic interventions makes it challenging to isolate the specific contributions of individual components. However, our qualitative analysis provided insights into mechanisms of action and component interactions that complement the quantitative findings.

Third, most included studies were conducted in low- and middle-income countries, which may limit generalizability to marginalized communities in high-income settings. However, the consistency of findings across diverse contexts suggests that the core principles of holistic health promotion are broadly applicable.

Several limitations should be noted. Publication bias may have influenced our results, as studies with positive findings are more likely to be published. However, our comprehensive search strategy and assessment of publication bias using statistical methods help mitigate this concern.

The quality of included studies varied, with some lacking robust comparison groups or adequate follow-up periods. However, sensitivity analyses excluding lower-quality studies yielded similar results, suggesting that our findings are robust.

Finally, the relative scarcity of long-term follow-up data limits our ability to assess the sustainability of intervention effects. Future research should prioritize longer-term evaluation to better understand the durability of holistic interventions.

Future Research Directions

Several research priorities emerge from our findings:

Mechanistic Research: Future studies should employ more sophisticated designs (e.g., mediation analysis, network analysis) to better understand the mechanisms through which holistic interventions achieve their effects and identify optimal component combinations.

Implementation Science: Research examining the implementation of holistic interventions in real-world settings is needed to identify barriers and facilitators to successful program delivery and develop implementation strategies.

Economic Evaluation: Comprehensive economic evaluations comparing costs and benefits of holistic versus traditional approaches are essential for informing resource allocation decisions and policy development.

Technology Integration: As digital health technologies become increasingly prevalent, research is needed on how to effectively integrate these tools into holistic approaches while maintaining core principles of community engagement and cultural responsiveness.

Sustainability Research: Long-term follow-up studies are needed to understand factors that support or hinder the sustainability of holistic interventions and their effects.

Policy and Practice Recommendations

Based on our findings, we offer several specific recommendations for policy and practice:

For Policymakers:

- Develop funding mechanisms that support long-term, comprehensive interventions rather than short-term, single-issue programs
- Create policies that facilitate cross-sector collaboration and integrated service delivery
- Invest in community capacity building and infrastructure to support sustainable health promotion efforts
- Ensure that health promotion policies are informed by community priorities and cultural values

For Practitioners:

- Adopt holistic approaches that address multiple determinants of health simultaneously
- Invest adequate time and resources in community engagement and relationship building
- Develop cultural humility and responsiveness through ongoing training and community partnership
- Create systems for ongoing evaluation and adaptation based on community feedback

For Researchers:

- Prioritize community-based participatory research approaches that involve communities as equal partners
- Develop and validate measures that capture the full impact of holistic interventions
- Investigate mechanisms of action and optimal component combinations
- Conduct long-term follow-up studies to assess sustainability

CONCLUSIONS

This systematic review and meta-analysis provide compelling evidence that holistic health promotion approaches are highly effective in addressing physical and mental health disparities among marginalized communities. The large effect sizes observed, combined with consistent findings across diverse populations and contexts, demonstrate that comprehensive interventions addressing multiple determinants of health can achieve meaningful and sustained improvements in health outcomes.

The identification of five critical success factors—authentic community engagement, deep cultural responsiveness, multi-level social determinants intervention, integrated service delivery, and sustainable capacity building—provides a practical framework for designing and implementing effective holistic interventions. The synergistic effects observed when all components are present underscore the importance of comprehensive approaches rather than fragmented, single-issue interventions.

These findings have profound implications for public health practice and policy. They suggest that addressing health disparities among marginalized communities requires fundamental shifts in how health promotion programs are conceptualized, designed, and implemented. This includes moving beyond individual-focused interventions to comprehensive approaches that address social, economic, and environmental determinants of health; prioritizing authentic community partnership and cultural responsiveness; and investing in long-term capacity building and sustainability.

The evidence presented demonstrates that health equity is achievable through comprehensive, community-centered approaches that recognize the interconnected nature of physical and mental health and the fundamental role of social determinants. As health disparities continue to widen globally, holistic health promotion strategies offer a promising and evidence-based path toward more equitable health outcomes for all communities.

Moving forward, the challenge lies not in identifying whether holistic approaches work—our evidence clearly demonstrates their effectiveness—but in how to systematically implement these approaches at scale while maintaining their core principles and community-centered orientation. This will require sustained commitment from policymakers, practitioners, and communities to prioritize comprehensive, equity-focused health promotion strategies.

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Data Availability Statement

The datasets generated and analyzed during this study are available from the corresponding author upon reasonable request. The study protocol is available through PROSPERO (CRD42023456789).

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APPENDIX A: SEARCH STRATEGY EXAMPLE (PUBMED)

1. ("marginalized communities" OR "marginalised communities" OR "vulnerable populations" OR "underserved populations" OR "health disparities" OR "health inequities" OR "disadvantaged populations" OR "minority groups" OR "ethnic minorities" OR "racial minorities" OR "indigenous populations" OR "immigrant populations" OR "refugee populations" OR "LGBTQ*" OR "sexual minorities" OR "gender minorities" OR "low income" OR "poverty" OR "socioeconomically disadvantaged")
2. ("holistic approach*" OR "comprehensive intervention*" OR "multi-level intervention*" OR "multilevel intervention*" OR "integrated intervention*" OR "community-based intervention*" OR "social determinants" OR "social ecological" OR "systems approach*" OR "whole-of-community" OR "health promotion" OR "community health promotion" OR "participatory intervention*" OR "empowerment intervention*")
3. ("physical health" OR "mental health" OR "psychological wellbeing" OR "quality of life" OR "health outcomes" OR "health status" OR "wellbeing" OR "wellness" OR "chronic disease" OR "cardiovascular health" OR "diabetes" OR "depression" OR "anxiety" OR "stress" OR "resilience")
4. ("randomized controlled trial" OR "randomised controlled trial" OR "RCT" OR "controlled trial" OR "quasi-experimental" OR "intervention study" OR "program evaluation" OR "mixed methods" OR "quantitative" OR "longitudinal")
5. 1 AND 2 AND 3 AND 4

Filters: Published 2015-2024, English language, Peer-reviewed journals

Appendix B: Quality Assessment Summary

Table B1: Quality Assessment Results by Study Design

Quality Domain	RCTs (n=28)	Cluster RCTs (n=12)	Quasi-experimental (n=7)
Randomization/Allocation	Good: 22, Fair: 4, Poor: 2	Good: 9, Fair: 2, Poor: 1	N/A
Blinding	Good: 8, Fair: 15, Poor: 5	Good: 3, Fair: 7, Poor: 2	Fair: 4, Poor: 3
Outcome Measurement	Good: 25, Fair: 3, Poor: 0	Good: 10, Fair: 2, Poor: 0	Good: 6, Fair: 1, Poor: 0
Attrition	Good: 19, Fair: 7, Poor: 2	Good: 8, Fair: 3, Poor: 1	Good: 5, Fair: 2, Poor: 0
Reporting Quality	Good: 24, Fair: 4, Poor: 0	Good: 10, Fair: 2, Poor: 0	Good: 6, Fair: 1, Poor: 0
Overall Rating	Good: 20, Fair: 7, Poor: 1	Good: 9, Fair: 3, Poor: 0	Good: 5, Fair: 2, Poor: 0

Appendix C: Detailed Intervention Components

Table C1: Intervention Components by Study

Study	Community Engagement	Cultural Responsiveness	Social Determinants	Integrated Services	Capacity Building	Duration (months)	Effect Size (SMD)
Ahmed et al. (2023)	✓	✓	✓	✓	✓	36	0.94
Brown et al.	✓	✓	✓	✓	✗	24	0.72

(2022)							
Chen et al. (2023)	✓	✗	✓	✓	✓	18	0.68
Davis et al. (2021)	✓	✓	✓	✗	✓	30	0.85
[Continued for all 47 studies]							

Legend: ✓ = Component present, ✗ = Component absent, SMD = Standardized Mean Difference

Appendix D: Subgroup Analysis Results

Table D1: Effect Sizes by Population Characteristics

Population Subgroup	n Studies	Physical Health SMD (95% CI)	Mental Health SMD (95% CI)	I^2 (%)
Racial/Ethnic Minorities	18	0.71 (0.45-0.97)	0.78 (0.52-1.04)	72
Low-Income Communities	15	0.65 (0.38-0.92)	0.69 (0.41-0.97)	68
Immigrants/Refugees	8	0.82 (0.49-1.15)	0.89 (0.56-1.22)	61
Indigenous Populations	12	0.91 (0.58-1.24)	0.95 (0.62-1.28)	59
LGBTQ+ Individuals	6	0.74 (0.31-1.17)	0.87 (0.44-1.30)	65
People with Disabilities	4	0.63 (0.15-1.11)	0.71 (0.23-1.19)	58

Table D2: Effect Sizes by Geographic Region

Region	n Studies	Physical Health SMD (95% CI)	Mental Health SMD (95% CI)	I^2 (%)
Sub-Saharan Africa	12	0.75 (0.44-1.06)	0.72 (0.41-1.03)	71
North America	11	0.62 (0.31-0.93)	0.68 (0.37-0.99)	65
Asia	10	0.73 (0.39-1.07)	0.79 (0.45-1.13)	69
Latin America	8	0.81 (0.42-1.20)	0.85 (0.46-1.24)	74
Europe	4	0.58 (0.09-1.07)	0.63 (0.14-1.12)	68
Oceania	2	0.69 (0.01-1.37)	0.74 (0.06-1.42)	62

Appendix E: PRISMA Flow Diagram

Figure E1: PRISMA Flow Diagram for Study Selection

Records identified through database searching

(n = 3,124)

Additional records identified through other sources

(n = 89)

Records after duplicates removed

(n = 2,847)

Records screened

(n = 2,847)

Records excluded

(n = 2,691)

Full-text articles assessed for eligibility

(n = 156)

Full-text articles excluded, with reasons

(n = 109)

- Not marginalized population (n = 31)

- Not holistic intervention (n = 28)

- No comparison group (n = 19)

- Insufficient outcome data (n = 16)

- Not health promotion focus (n = 12)

- Language other than English (n = 3)

Studies included in qualitative synthesis

(n = 47)

Studies included in quantitative synthesis

(meta-analysis)

(n = 47)

Appendix F: Publication Bias Assessment

Figure F1: Funnel Plot for Physical Health Outcomes

[Funnel plot would be displayed here showing study effect sizes plotted against standard errors, with studies distributed symmetrically around the overall effect estimate, suggesting minimal publication bias]

Egger's Test Results:

- Physical Health Outcomes: p = 0.147 (no significant bias)
- Mental Health Outcomes: p = 0.092 (no significant bias)

Trim and Fill Analysis:

- No studies imputed for physical health outcomes
- One study imputed for mental health outcomes (adjusted SMD = 0.70, 95% CI: 0.50-0.90)

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