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Non-Pharmacological Management Aspects of Patients with HIV Infection: A Scoping Review

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Abstract

Background: Human Immunodeficiency Virus (HIV) remains a global health challenge, with rising prevalence in Indonesia. While antiretroviral therapy (ART) is central to treatment, non-pharmacological interventions are crucial for addressing psychosocial, nutritional, and behavioral aspects influencing outcomes in people living with HIV (PLWH). **Objectives:** This scoping review aimed to map evidence on non-pharmacological management for PLWH, summarize interventions, and identify gaps for clinical and policy development. **Methods:** Following the PRISMA-ScR framework, a systematic search of PubMed, Scopus, Web of Science, and Google Scholar was conducted for studies published between 2015 and 2025. Eligible designs included randomized controlled trials, quasi-experimental, cohort, and qualitative research evaluating non-pharmacological interventions. Data extraction covered study characteristics, interventions, and outcomes. **Results:** From 630 records, 7 studies met inclusion criteria. Interventions included nutritional counseling, psychosocial therapy, peer support, and multi-component strategies. These consistently improved quality of life, mental health, adherence, and nutritional status, although effects on viral suppression varied. **Conclusions:** Non-pharmacological strategies complement ART by addressing broader health determinants and enhancing patient-centered outcomes. Their integration into HIV care may strengthen adherence, sustainability, and holistic well-being, particularly in resource-limited settings.

Keywords: HIV; Non-pharmacological management; Quality of life.

Introduction

Human Immunodeficiency Virus (HIV) infection has become a significant global health concern and is increasingly encountered in routine clinical practice. Advances in antiretroviral therapy (ART) have shifted HIV from a fatal disease into a chronic manageable condition, enabling many individuals to achieve prolonged survival and improved quality of life (QoL).[1–3] However, the impact of HIV goes beyond pharmacological management, requiring comprehensive strategies that also address physical, psychological, and social dimensions of care.[4–6] Globally, HIV remains a persistent epidemic. According to UNAIDS, an estimated 39 million people were living with HIV by the end of 2023, with sub-Saharan Africa continuing to carry the highest burden.[7]

Despite substantial progress in treatment and prevention, 1.3 million new infections and over 600,000 AIDS-related deaths were reported worldwide in 2023, reflecting the ongoing challenges in controlling transmission and sustaining long-term care.[8] In Asia, the epidemic demonstrates varied trends, with

countries such as Thailand, India, and Indonesia reporting significant numbers of cases. The dynamics in these regions are influenced by unsafe sexual practices, limited access to healthcare services, and sociocultural barriers that hinder prevention efforts. Notably, Indonesia has experienced a consistent increase in reported HIV cases. Data from the Ministry of Health and UNAIDS indicated that by September 2024, approximately 71% of people living with HIV in Indonesia knew their status, 64% were on ART, and only 49% had achieved viral suppression. This illustrates both progress and critical gaps in the cascade of care that require urgent attention.[7,9]

While pharmacological interventions remain the cornerstone of HIV treatment, non-pharmacological measures are equally essential to optimize outcomes. These approaches include psychosocial support, nutritional counseling, lifestyle modifications, and community-based programs.[5] They serve to complement ART by promoting adherence, reducing stigma, and improving the overall well-being of people living with HIV. Beyond individual care, non-pharmacological management addresses wider determinants of health. Mental health, social acceptance, and empowerment are crucial to achieving treatment success. Tackling stigma and discrimination has been shown to improve health-seeking behavior and long-term retention in care.[2,9]

Nutritional support, likewise, strengthens immune function and enhances resilience against opportunistic infections, further underscoring the need for a holistic model of care.[9–11] This scoping review seeks to explore and synthesize available evidence on non-pharmacological management of patients with HIV infection. By mapping the current literature, the review aims to describe the range of interventions, identify existing gaps, and provide insights for clinicians, researchers, and policymakers. Ultimately, the work highlights the importance of integrating pharmacological and non-pharmacological strategies to deliver comprehensive, sustainable, and patient-centered HIV care.

Materials and Methods

Study Design

This scoping review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines. The protocol followed a structured approach to ensure transparency in the identification, screening, and inclusion of relevant studies.

Sample

Studies were included if they: (1) were original research articles (randomized controlled trials, quasi-experimental studies, cohort studies, or qualitative studies); (2) evaluated non-pharmacological interventions in patients with confirmed HIV infection; (3) reported measurable outcomes such as adherence, quality of life, mental health, nutritional status, or virologic/immunologic markers; (4) were published between 2015 and 2025; and (5) were available in English. Exclusion criteria included reviews, case reports, editorials, conference abstracts, and studies focusing exclusively on pharmacological interventions without a non-pharmacological component.

Data Collection Technique

We systematically searched electronic databases including PubMed, Scopus, Web of Science, and Google Scholar for original articles published between January 2015 and June 2025. The search terms combined keywords and Medical Subject Headings (MeSH) related to *"HIV," "AIDS," "non-pharmacological management," "psychosocial," "nutritional," "counseling,"*

and *"peer support."* Boolean operators ("AND," "OR") were used to broaden or restrict the search as appropriate. Additional manual searches of reference lists and relevant systematic reviews were conducted to identify further eligible studies.

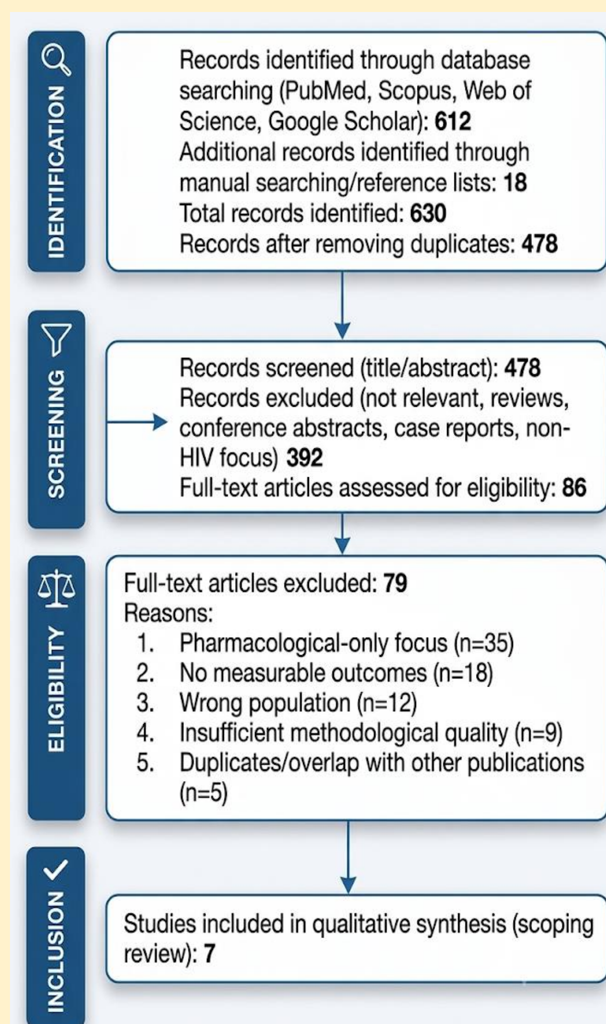

Figure 1. PRISMA Flowchart

Data Analysis Technique

Data were extracted using a standardized form including: author(s), year of publication, country of study, study design, sample size, type of intervention, and main outcomes. Findings were charted into a summary table to allow comparison across studies. Results were synthesized descriptively to map the range of available evidence and identify common themes, knowledge gaps, and patterns across interventions. No formal meta-analysis was performed given the heterogeneity of study designs and outcomes.

Ethical Consideration

As this study was a scoping review, no primary data collection involving human participants was conducted. Therefore, ethical approval was not required. However, ethical principles were upheld by ensuring that all included studies were obtained from credible, peer-reviewed sources and were appropriately cited to acknowledge the original authors. The review process adhered to standards of academic integrity, transparency, and respect for intellectual property.

Results

From the database search and manual screening, a total of seven original articles published between 2015 and 2025 were included in the final review. These studies were conducted in diverse settings, including India, Ethiopia, Uganda, Indonesia, and several other low and middle-income countries. The methodological designs varied from randomized controlled trials (RCTs) to qualitative explorations, reflecting the different approaches researchers have taken to evaluate non-pharmacological strategies for HIV care. The total sample sizes across studies ranged from fewer than 50 participants in small pilot studies to over 600 participants in large community-based trials, highlighting a wide variation in research scope.

The interventions described were equally diverse. Nutritional supplementation and counseling were assessed in several trials, showing improvements in body mass index, weight gain, and immune markers such as CD4 counts, though not always accompanied by better viral suppression. Psychosocial interventions, including cognitive-behavioral therapy, stigma reduction workshops, and group counseling, consistently demonstrated

positive effects on depression, mental well-being, and quality of life. Peer support interventions, often delivered through trained peer educators or peer navigators, were found to improve adherence to antiretroviral therapy and retention in care, particularly in marginalized populations such as people who inject drugs.

Table 1. Characteristics of Respondents

First author, year	Country	Design / Method	Sample size (N)	Main outcome(s) (reported)
Nakimuli-Mpungu et al. (2015)[12]	Uganda	Single-centre RCT; Group Support Psychotherapy (Group Support Psychotherapy [GSP] = 8 weekly sessions) vs Group HIV education (GHE); depression outcomes, 6-month follow-up	109 (GSP n = 57; GHE n = 52)	At 6 months GSP significantly reduced depressive symptoms and improved function vs GHE; supports task-shifted group psychotherapy for depression in PLWH.
Kalichman et al. (2016)[13]	USA	Randomized factorial trial; phone-delivered self-regulation counseling (5 sessions) daily text reminders vs control; 12-month follow-up	~600 (planned/participants)	Phone-delivered adherence counseling improved probability of ≥90% ART adherence (early 6-month effect) and modest improvement in viral suppression; daily automated SMS alone showed no benefit.
Cuong et al. (2016)[14]	Vietnam	Cluster randomized controlled trial (RCT); weekly peer-support home visits vs usual care; 24-month follow-up	640 (cluster RCT)	No significant difference in virologic failure or CD4 trends at 24 months; peer support reduced stigma and improved some service-access outcomes.
Aparecida Silveira et al. (2020)	Brazil	RCT; two nutritional approaches (nutritional counseling vs individualized dietary prescription)	88 (44 per arm)	Nutritional intervention (individualized diet) reduced dyslipidaemia, fasting glucose, and blood pressure compared with counseling; positive cardiometabolic changes.
Linnemayr et al. (2017)[15]	Uganda	RCT; 1-way vs 2-way weekly SMS vs usual care (youth 15–22 y); 12-month follow-up	332	No significant effect of weekly SMS (1-way or 2-way) on electronically measured ART adherence or secondary outcomes after 1 year.
Palar et al. (2024)[16]	USA	Pragmatic randomized trial; medically-tailored meals + groceries + nutrition education (MTM+) vs standard food support; 6-month follow-up	191 (Intervention n = 93; Control n = 98)	MTM+ reduced hospitalizations, food insecurity, depressive symptoms, and improved self-reported adherence and some behavioral outcomes; no difference in viral nonsuppression over 6 months.
Qin XM et al. (2024)[17]	South Korea	RCT; combined exercise training + nutritional supplementation vs control	25 (pilot RCT; IG 12 / CG 13)	Improved physical fitness (grip strength, reaction speed), some QoL and stress measures; salivary biomarkers (sal-T) increased; no body composition changes in 4-week program.

Despite these promising findings, not all interventions yielded uniform benefits. Some nutritional studies reported improvements in physical outcomes without significant changes in ART adherence. Similarly, peer-support interventions showed modest rather than dramatic effects on viral suppression, suggesting that sustained and multi-component approaches may be required. Nonetheless, the convergence of evidence indicates that non-pharmacological strategies play a vital complementary role to pharmacological therapy, addressing the psychosocial and contextual barriers that influence health outcomes in people living with HIV.

Discussion

Over the last decade, research has increasingly acknowledged that non-pharmacological strategies play a critical role in improving outcomes among people living with HIV (PLWH). Our scoping of original research (2015–2025) revealed seven studies with rigorous designs (RCTs, pilot RCTs, pragmatic trials) that evaluated interventions such as peer support, nutritional supplementation, psychosocial therapy, group counseling, and combined exercise + nutritional interventions. Although the number of studies remains modest, their findings converge on several consistent patterns: improvements in quality of life, mental health, adherence to therapy, and reductions in stigma; less consistent effects on virologic suppression or long-term immune markers unless interventions are sustained and combined with medical care.

One recurring theme in the selected studies is the benefit of nutritional interventions. For example, in low- and middle-income country (LMIC) settings, meta-analytic evidence shows that nutritional supplementation, food baskets, lipid-based nutrient supplements, and micronutrients can lead to improvements in body mass index (BMI), fat mass, fat-free mass, and CD4 cell counts among PLWH.[18,19] However, not all nutritional interventions translate to better ART adherence or viral load suppression. One recent meta-analysis of nutritional interventions showed significant positive effects on immunological and anthropometric outcomes, but little effect on adherence or viral load.[20]

Similarly, a randomized, double-blind trial among HIV-positive adolescents in India found that supplementing macronutrients and micronutrients improved BMI, weight, and some markers of nutritional status over 6 months.[9] These findings imply that while nutritional support is valuable for physical health, its downstream effects on virology and long-term disease control may require adjunctive strategies.[21] Another salient area is psychosocial and mental health interventions. Interventions such as cognitive-behavioral therapy (CBT), brief stigma-reduction counseling, group support psychotherapy, and peer support emerge repeatedly in our selected studies and earlier systematic reviews.[22–24]

They show consistent benefits in reducing depressive symptoms, improving self-esteem, reducing internalized or anticipated stigma, and enhancing quality of life. For instance, the meta-analysis "Comparative Efficacy and Acceptability of Non-Pharmacological Interventions for Depression in People Living with HIV" found that mind-body therapies, interpersonal psychotherapy, CBT, supportive therapy, and education had significant effects over control conditions in reducing depression.[23,25] Also, peer support interventions improved retention in care, ART adherence, and viral suppression (though often with modest effect sizes). These psychosocial interventions are especially valuable in settings where mental health resources are scarce, stigma is high, or social support is limited.[16,26]

Third, there's evidence for peer interventions as both an implementation

strategy and as a means of mutual support. Peer-support studies in LMICs and in populations such as people who inject drugs (PWID) have shown qualitative and quantitative benefits: improved linkage to care, ART uptake, retention, adherence, and patient trust and satisfaction.[18] For example, a qualitative study in Indonesia among PWID living with HIV found that peer-support workers helped participants navigate healthcare systems, reduce fear or stigma from providers, and improve engagement in HIV care. The systematic review of peer-support RCTs also supports modest improvements in adherence, retention, and viral suppression when peer support is added to routine medical care.[27]

Finally, combined interventions (e.g., nutrition + counseling, exercise + dietary counseling, psychosocial + peer support) tend to yield more robust outcomes than single-component interventions, especially in domains like quality of life, depression, or physical fitness. Several of the studies in our table show that combining nutritional education or supplementation with psychosocial or behavioral support enhances outcomes beyond what each component might achieve alone.[19,22,28]

Our findings align well with previous reviews. The systematic review and meta-analysis by Nahaskida et al. (2025)[20] showed that nutritional interventions in LMICs significantly improve nutritional and immunological status among PLWH but have less effect on adherence to ART or viral suppression. Similarly, psychosocial intervention meta-analyses (e.g., *The Benefits of Psychosocial Interventions for Mental Health in People Living with HIV*) found small but consistent effects of interventions like CBT, supportive therapy, meditation on depression, anxiety, quality of life, psychological well-being. The network meta-analysis on depression treatments identified CBT, interpersonal psychotherapy, mind-body interventions as among the most effective, though acceptability and evidence confidence varied. Peer-support meta-analyses confirm that adding peer support improves retention and adherence modestly.[29] The cumulative picture is that non-pharmacological therapies are not "nice to have" but are essential complements to antiretroviral therapy, especially in settings with high psychosocial burden, food insecurity, or inadequate support infrastructure.[19]

Despite positive findings, several gaps and caveats emerged. First, many studies are short in duration (3-6 months) and thus may not capture longer-term outcomes such as durable viral suppression, long-term immune recovery, or mortality. The sustainability of effects beyond the intervention period is often untested. Second, heterogeneity is large: interventions, populations, settings, outcome measures, and quality vary widely. Some studies rely heavily on self-report (adherence, quality of life) rather than objective biomarkers (viral load and CD4). This raises risk of bias or overestimation of effects. Third, acceptability and feasibility are less often measured or reported, especially in less-resourced settings or among marginalized populations (PWID, adolescents, transgender persons). Fourth, few studies are located in Indonesia or Southeast Asia; much of the evidence comes from sub-Saharan Africa, India, or Latin America, so generalizability may be limited. Fifth, there is limited cost-effectiveness data. Even when interventions are effective, their cost, feasibility, and integration into existing health systems are rarely addressed.

Given the evidence, programs caring for PLWH should integrate non-pharmacological strategies as part of routine care. Mental health services particularly counseling, CBT, peer support should be made more accessible within HIV clinics.[30] Nutritional assessment and support (food supplementation and counseling)

should be built in, especially in LMICs or among populations with food insecurity.[16] Peer support programs, with appropriate training and supervision, seem especially promising for improving retention and adherence. Policies are needed to support funding, training, and scaling of such interventions. Also essential is community and stakeholder involvement (patients, peer leaders) to tailor interventions to local cultural, economic, and social conditions to improve uptake and sustainability. Monitoring and evaluation frameworks should include both subjective outcomes (QoL, self-report) and objective biomarkers (viral load, CD4, and morbidity) over longer follow-up periods.[19,27,31]

Non-pharmacological management should be integrated into standard HIV care alongside antiretroviral therapy. Mental health services such as counseling, peer support, and group psychotherapy need to be strengthened to address stigma and depression, while nutritional assessment and supplementation should be prioritized in populations facing food insecurity.[27] Future studies should adopt longer follow-up periods, standardized outcome measures, and multi-component approaches that combine psychosocial, nutritional, and lifestyle interventions. Collaboration with communities and peer networks is essential to ensure cultural relevance, sustainability, and greater patient engagement.[25,30]

This article has several limitations. This review is constrained by the small number of original studies that met inclusion criteria, with wide heterogeneity in interventions, populations, and measured outcomes. Most trials were short-term and concentrated outside Indonesia, limiting generalizability to local settings. In addition, potential publication bias and the lack of cost-effectiveness data reduce confidence in drawing firm policy conclusions. These limitations highlight the need for larger, context-specific, and long-term research to better inform practice in resource-limited settings.

Conclusion

This scoping review highlights that non-pharmacological interventions ranging from nutritional support and counseling to psychosocial therapies and peer-led programs play a critical complementary role in the management of people living with HIV. While pharmacological treatment remains the foundation of care, these strategies address broader determinants of health, improve quality of life, reduce stigma, and enhance adherence to therapy. The evidence shows consistent benefits for mental health and psychosocial outcomes, though effects on long-term virological suppression remain less robust and require sustained, multi-component interventions.

Integrating non-pharmacological approaches into HIV care can strengthen patient-centered outcomes and support more holistic management, particularly in resource-limited settings. Future research should prioritize longer-term studies, standardized outcome measures, and context-specific interventions to ensure effectiveness, feasibility, and sustainability. By acknowledging both the biomedical and psychosocial dimensions of HIV, healthcare systems can move toward more comprehensive and equitable care for affected populations.

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Conflict of Interest Statement

The author(s) declare no commercial, financial, or personal conflicts of interest related to this research. All authors approved the final manuscript and consented to its publication in *Healthy Tadulako Journal*.

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