



MINDFUL MICRO-FARMING: ASSESSING THERAPEUTIC GARDENING PROGRAMS FOR DEPRESSION RELIEF IN LOW-INCOME COMMUNITIES SELECTED RURAL MUNICIPALITIES IN NUEVA ECIJA

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ABSTRACT

This study evaluated the effectiveness of an eight-week therapeutic gardening program as a community-based intervention for reducing depression among low-income rural residents in Nueva Ecija, Philippines. Utilizing a quantitative, quasi-experimental pre-test and post-test research design, the study screened and randomly selected N = 300 vulnerable adults aged 18–35 exhibiting mild-to-moderate depressive symptoms via multi-stage cluster sampling. The active intervention combined structured micro-farming activities – including planting, tending, and harvesting vegetables – with integrated mindfulness practices across five socio-economically challenged, agriculture-dependent municipalities: Guimba, Licab, Rizal, Pantabangan, and Carranglan. The Patient Health Questionnaire-9 (PHQ-9), a standardized psychometric instrument demonstrating strong internal consistency ($\alpha = .89$), was electronically administered to establish baseline conditions and measure post-intervention psychological shifts. Inferential data analysis using paired t-tests was executed to determine statistically significant differences in depression severity scores over the eight-week implementation period, supplemented by descriptive statistics to track community engagement patterns. Ethical benchmarks were strictly maintained in accordance with the Data Privacy Act of 2012 and the Psychological Association of the Philippines (PAP) Code of Ethics, securing voluntary informed consent and providing institutional referral paths for severe clinical cases. The findings offer a robust, empirical framework for local government units, municipal health offices, and academic stakeholders to institutionalize scalable, contextually relevant nature-based therapies. Eventually, this research provides an evidence-based strategy to bypass systemic psychiatric barriers, decentralize mental health delivery at the grassroots level, and advance United Nations Sustainable Development Goal 3 (SDG 3) across rural agricultural communities.

KEYWORDS: *Therapeutic Gardening, Depression Relief, PHQ-9, Micro-Farming, Rural Mental Health*

INTRODUCTION

The contemporary landscape of global public health is increasingly defined by the staggering escalation of mental health disorders, among which clinical depression stands as a primary driver of non-fatal disease burden and long-term disability worldwide. Characterized by persistent affective flattening, cognitive deficits, and debilitating somatic disruptions, depressive disorders fundamentally undermine economic productivity and community cohesion. Historically, psychiatric care delivery has maintained a deeply institutionalized, pharmacocentric, and clinical orientation. However, the accelerating volume of affected individuals globally has outpaced the operational capacity of conventional psychological infrastructures, exposing structural vulnerabilities in healthcare delivery channels. This discrepancy has catalyzed a critical paradigm shift toward decentralized, non-pharmacological, and community-embedded therapeutic options. Within this strategic pivot, ecotherapy and nature-based therapeutic modalities specifically structured horticultural interventions and community-led micro-farming have emerged as highly viable, clinically sound alternatives. These approaches utilize the intrinsic restorative qualities of ecological environments to alleviate psychological distress, presenting an innovative, scalable frontline defense against the expanding global burden of mental illness.

Despite the well-documented psychological benefits of nature exposure, modern mental health trends reveal a stark geographic and socioeconomic imbalance in how these ecotherapeutic interventions are evaluated and operationalized. While comprehensive empirical literature firmly establishes that routine interaction with green infrastructure and participatory agrarian activities downregulates biomarkers of stress and mitigates depressive pathology, these strategies remain fundamentally under-researched within low- and middle-income countries (Ainamani et al., 2022). In developing, resource-constrained regions, the structural manifestation of mental illness is uniquely compounded by systemic socioeconomic vulnerabilities, including severe poverty, chronic inflation, and infrastructure deficits. Marginally positioned populations are simultaneously subjected to extreme environmental and subsistence-related distress while being systematically excluded from traditional psychiatric avenues due to financial hurdles and prohibitive specialist fees. Recent studies emphasize that gardening activities can significantly counteract these daily



stressors by lowering clinical depression scores, yet this potential remains unmapped in economically marginalized territories where mental healthcare is heavily stratified (Ainamani et al., 2022; Lu et al., 2023). Consequently, there is an urgent structural requirement to conceptualize, deploy, and empirically validate low-threshold, culturally congruent mental health paradigms designed to operate effectively within the pragmatic socio-ecological constraints of marginalized settings.

In the national context of the Philippines, these overarching systemic bottlenecks are pronounced, trapping the country's decentralized administrative landscape in an enduring psychological care deficit. Conventional mental health assets and licensed clinical professionals remain heavily centralized in major urban metropolitan centers, leaving peripheral provinces and agrarian rural zones effectively marooned from standard psychological resources. This institutional gap is further aggravated by pervasive, deeply entrenched cultural stigma, which frequently frames psychological illnesses as personal moral failures, direct spiritual deficiencies, or social liabilities, effectively suppressing seek-help behavior and early clinical reporting. For impoverished households located in the deep countryside, these compounded barriers render modern clinical solutions practically inaccessible. Ironically, while rural populations reside in immediate geographic proximity to vast expanses of agricultural land, their daily relationship with the physical environment is typically defined by high-stress agricultural labor, shifting weather patterns, and market-driven economic survival. The therapeutic potential of the landscape is systematically obscured by the severe anxieties of economic extraction and livelihood survival. Preliminary investigations within the local archipelago confirm that green engagement significantly elevates subjective well-being and yields pronounced health benefits among Filipino practitioners compared to non-gardeners (Daiz et al., 2022). However, moving the practice from unstructured residential planting into an active, medically tracked mental health program requires precise empirical monitoring.

Descending to the provincial architecture of Nueva Ecija historically designated as the "Rice Granary of the Philippines"—this environmental and socio-psychological paradox becomes acutely visible. Within economically strained, agriculture-dependent municipalities such as Guimba, Licab, Rizal, Pantabangan, and Carranglan, low-income adult residents navigate persistent stress linked directly to unstable agricultural labor economies, high poverty incidence, and localized resource scarcity. These systemic pressures quietly fuel a hidden epidemic of mild-to-moderate depressive disorders that consistently erode community resilience and human capital within the localized barangay system. This localized vulnerability exposes a profound research gap that directly justifies the execution of this empirical investigation. While international clinical trials have extensively validated the therapeutic mechanics of horticultural engagement within highly controlled institutional settings such as modern psychiatric wards, geriatric residential facilities, and specialized rehabilitation clinics there is an absolute scarcity of peer-reviewed data assessing structured horticultural therapy as a decentralized, grassroots community wellness program within the organic, rural landscapes of developing nations (Xu et al., 2023). Current mental health frameworks lack localized data indicating how nature-based therapies behave when implemented directly within a vulnerable agricultural collective.

Furthermore, current literature fails to address the unique intersection of economic marginalization, agricultural identity, and mindfulness-infused micro-farming within the Philippine barangay framework. It remains empirically unverified whether systematically reorienting a rural community's relationship with the soil shifting it from an exhausting socio-economic obligation of survival into a highly structured, voluntary, and mindfully executed space of psychological restoration can serve as a clinically significant psychotherapeutic countermeasure against depression. This research directly targets this gap by introducing a structured, community-based intervention that transforms existing agrarian resources into a localized ecosystem of psychological healing. Global analyses of nature exposure therapies confirm that passive viewing is vastly inferior to participatory and immersive agrarian tasks when targeting severe emotional despondency, which highlights the clinical necessity of tracking long-term program engagement (Paredes-Céspedes et al., 2024).

The practical applications and long-term significance of this applied research are broad, offering immediate utility across multiple operational levels of community governance and regional health planning. For local government units and municipal health offices, this study provides a concrete, empirically verified operational template to embed accessible, cost-effective mental health interventions directly into the primary care workflows of Barangay Health Emergency Response Teams. By demonstrating the clinical validity of an active nature-based protocol that utilizes existing public plots or backyard spaces, the research provides a clear roadmap for municipal policymakers to maximize the cultural and health-promoting services of their ecological landscapes (Aldea, 2025). This operational integration directly aligns with and advances the United Nations Sustainable Development Goal 3, specifically Target 3.4, which mandates the reduction of premature mortality from non-communicable diseases through the systematic promotion of mental health and well-being. For the targeted adult demographic aged 18–35, the program acts as a dual-purpose intervention: it provides immediate, non-stigmatizing psychological relief and cognitive restoration while simultaneously cultivating sustainable micro-farming skills that bolster household food security and build a sense of collective self-efficacy.

To ensure empirical validity and theoretical precision, this investigation is structurally anchored upon a multidisciplinary framework combining environmental psychology, evolutionary biology, and cognitive behavioral



theory. The underlying logic of the program is grounded first in the Biophilia Hypothesis, which asserts an innate, evolutionary attachment within human beings toward living organisms, suggesting that active collaboration with natural systems naturally triggers physiological down-regulation and psychological repair (Shanahan et al., 2019). This foundational premise is further operationalized via Stress Recovery Theory and Attention Restoration Theory, which explain that natural landscapes possess distinct aesthetic and structural elements that automatically engage involuntary attention, thereby allowing depleted voluntary cognitive mechanisms to recover while reducing sympathetic nervous system arousal and breaking the cycles of cognitive rumination that reinforce depressive states (Paredes-Céspedes et al., 2024). Additionally, to guarantee long-term behavioral adherence within a rural social structure, the study integrates Attachment Theory adapted for environmental leisure spaces. This concept shows that when individuals view an agricultural activity as a voluntary, mindful space of community connection rather than a stressful economic burden, they form a strong psychological attachment to the practice (Mamirkulova, 2026). This emotional transition nurtures a supportive mental environment that actively counters the feelings of helplessness and chronic isolation that define depressive pathologies.

The rationale and urgency for conducting this applied research at this particular socio-economic juncture are critical. As inflation, environmental stress, and economic insecurity continue to strain low-income rural households, the psychological baseline of peripheral communities faces severe risk (White, 2023). Relying entirely on a centralized, specialist-dependent clinical model guarantees that marginalized provincial populations will remain permanently excluded from essential psychiatric services. Waiting for traditional psychological infrastructure to scale down to every remote barangay is no longer viable, given the active toll of untreated depression on family structures and regional labor productivity. There is an immediate, undeniable requirement to pioneer alternative, science-based, and highly scalable psychological modalities that effectively utilize the physical land assets, cultural agricultural heritages, and volunteer workforces already present within the communities (Schafer, 2022).

Research Objectives

The study aims to evaluate the effectiveness of therapeutic gardening programs as a community-based intervention for reducing depression among residents of low-income rural municipalities in Nueva Ecija. Specifically, this sought;

Specific Objectives

1. To measure the pre-intervention depression levels of respondents using the Patient Health Questionnaire-9 (PHQ-9) to establish baseline psychological conditions.
2. To assess the post-intervention depression levels of respondents using the PHQ-9 and compare results with baseline scores to determine changes in severity.
3. To analyze the effectiveness of therapeutic gardening programs in reducing depressive symptoms and provide evidence-based recommendations for integrating micro-farming into local mental health initiatives.

MATERIALS AND METHODS

This study employed a quantitative, quasi-experimental design tailored to the socio-cultural and agricultural realities of Nueva Ecija, using multi-stage cluster sampling to ensure representation across rural municipalities. The PHQ-9 instrument measured baseline and post-intervention depression levels, with strict ethical safeguards observed to guarantee reliability, validity, and cultural relevance within the barangay system.

Research Design

This study used a quantitative, quasi-experimental design with a pre-test and post-test approach to evaluate the effectiveness of therapeutic gardening programs in reducing depressive symptoms. The intervention consisted of structured micro-farming activities for example planting, tending, and harvesting vegetables combined with mindfulness practices, implemented over an eight-week period. This design allowed for measurable comparisons of depression levels before and after participation.

Respondents of the Study

The respondents were 400 adult residents aged 18–35 years old from low-income households in selected rural municipalities of Nueva Ecija. They were chosen because they represent vulnerable populations with limited access to mental health services and are highly exposed to socio-economic stressors. Screening was conducted using the Patient Health Questionnaire-9 (PHQ-9), and only individuals with mild to moderate depressive symptoms were included. Those with severe depression were excluded and referred to professional care.

Locale of the Study

The study was conducted in five rural municipalities of Nueva Ecija: Guimba, Licab, Rizal, Pantabangan, and Carranglan. These municipalities were selected based on poverty incidence rates and their dependence on agriculture, ensuring that the intervention was contextually relevant. Guimba and Licab represent lowland rice-farming communities, Rizal and Pantabangan highlight upland vegetable farming, while Carranglan reflects mixed agricultural livelihoods.



Instrumentation

The primary instrument was the Patient Health Questionnaire-9 (PHQ-9), a standardized and validated psychometric tool for assessing depression severity. The PHQ-9 has demonstrated strong internal consistency (Cronbach’s $\alpha = .89$), test–retest reliability ($r = .83$), and high sensitivity (88%) and specificity (85%) in detecting depressive symptoms. Its cross-cultural validity ensures accurate measurement in Filipino rural contexts.

Data Gathering Procedure

A multi-stage cluster sampling technique was employed. First, municipalities were purposively selected based on poverty and agricultural dependence. Second, barangays within each municipality were randomly chosen. Third, eligible individuals were screened using the PHQ-9. Finally, respondents were randomly selected from the screened pool to participate in the gardening program. Pre-test PHQ-9 surveys were administered before the intervention, followed by the eight-week gardening sessions facilitated by trained barangay volunteers, and post-test PHQ-9 surveys were conducted after completion.

Data Analysis

Data were analyzed using paired t-tests to determine statistically significant differences in depression scores before and after the intervention. Descriptive statistics were used to summarize demographic profiles and participation rates, while cross-tabulations were employed to examine variations across municipalities. This combination of inferential and descriptive analysis provided a comprehensive understanding of the intervention’s effectiveness.

Ethical Considerations

Ethical standards were strictly observed in compliance with the Data Privacy Act of 2012 and the Psychological Association of the Philippines (PAP) Code of Ethics. Informed consent was obtained from all participants, with clear assurances of confidentiality, anonymity, and voluntary participation. Permissions were secured from barangay councils and municipal health offices to ensure institutional accountability. Participants were informed of their right to withdraw at any stage without penalty, and those identified with severe depression were referred to professional services. These measures safeguarded the dignity, rights, and well-being of respondents while reinforcing the integrity of the research process within Nueva Ecija’s rural communities.

RESULTS

This section presents the empirical findings gathered from the eight-week implementation of the app-based digital peer support network, capturing baseline conditions, therapeutic outcomes, and user interaction metrics among the youth participants. Organized systematically, the subsequent tables detail the shift in participant anxiety severity levels, the statistical significance of the intervention's clinical impact, user interaction behavior with core features, and data-driven operational strategies for local institutionalization.

Table 1. Measurement of Pre-Intervention Depression Levels

PHQ-9 Baseline Severity	Municipalities					Total
	Guimba	Licab	Rizal	Pantabangan	Carranglan	
Mild Depression (5–9)	16 (19.5%)	9 (20.5%)	11 (19.0%)	11 (19.6%)	10 (16.7%)	57 (19.0%)
Moderate Depression (10–14)	66 (80.5%)	35 (79.5%)	47 (81.0%)	45 (80.4%)	50 (83.3%)	243 (81.0%)
Moderately Severe (15–19)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Total	82 (100.0%)	44 (100.0%)	58 (100.0%)	56 (100.0%)	60 (100.0%)	300 (100.0%)

N=300

Table 2. Assessment of Post-Intervention Depression Levels and Severity Shifts

Severity Level	Frequency (f)	Percent (%)
Minimal Depression (Scores 0–4)	114	38.00%
Mild Depression (Scores 5–9)	162	54.00%
Moderate Depression (Scores 10–14)	24	8.00%
Total	300	100.00%

N=300



Table 3. Analysis of Intervention Effectiveness and Framework Integration

Pair	Mean Difference	Std. Deviation	t	df	Sig. (2-tailed)
PHQ-9 Pre – Post	6.28	2.01	54.14	299	0.000

N=300; Significant if $p < .05$

DISCUSSION

The inferential analysis of this study demonstrates that an eight-week structured therapeutic gardening intervention yields a robust, statistically significant reduction in depression scores among low-income young adult residents (N = 300) across selected rural municipalities in Nueva Ecija. Prior to the intervention, baseline measurements established a high concentration of psychological distress, with 81.0% (n = 243) of the cohort suffering from moderate depression and the remaining 19.0 (n = 57) experiencing mild depressive symptoms. Following the micro-farming protocol, a profound downshift in clinical severity occurred, as 38.0% (n = 114) of participants transitioned into minimal depression, 54.0% (n = 162) shifted to mild depression, and only 8.0% (n = 24) remained in the moderate tier. The paired samples t-test confirmed this dramatic improvement, showing a mean reduction of 6.28 points (SD = 2.01) with a test statistic of $t(299) = 54.14, p < .001$. This highly significant p-value confirms that the clinical improvement is mathematically insulated from sampling variance.

In practical terms, these findings indicate that community-embedded ecotherapy, when paired with mindfulness practices, serves as a highly effective mechanism for alleviating depressive symptoms in socio-economically vulnerable populations. This research successfully fulfilled its structural objectives by establishing baseline parameters, tracking post-intervention symptom shifts, and demonstrating an empirically backed reduction in clinical distress. Ultimately, this low-threshold, localized framework effectively lowers cognitive despondency, affective flattening, and somatic anxiety while bypassing the cultural stigma and financial barriers that typically prevent low-income rural Filipinos from seeking formal psychiatric support.

The therapeutic outcomes observed in this study strongly align with global and local empirical literature evaluating nature-based psychiatric interventions. The pronounced reduction in PHQ-9 scores mirrors the meta-analytic conclusions of Lu et al. (2023), who established that structured horticultural therapy consistently downregulates stress biomarkers and reduces depression severity across diverse cohorts. Furthermore, the uniform geographic efficacy documented across Guimba, Licab, Rizal, Pantabangan, and Carranglan expands upon the findings of Ainamani et al. (2022), who argued that ecotherapeutic frameworks are highly effective but under-utilized tools in resource-constrained, low- and middle-income countries. Locally, these findings build upon the descriptive insights of G. Daiz et al. (2022), whose research confirmed that active Filipino gardeners experience higher baseline well-being than non-gardeners. This study advances local literature by proving that shifting agricultural interactions from routine household chores into an active, medically tracked, and mindfulness-infused program can actively mitigate clinical depressive episodes within marginalized communities.

Several interconnected environmental, psychological, and social mechanisms explain the success of this micro-farming framework. Grounded in Stress Recovery Theory (SRT) and Attention Restoration Theory (ART), regular immersion in natural agricultural settings triggers involuntary attention, which allows depleted cognitive pathways to rest, lowers sympathetic nervous system arousal, and disrupts the cyclic rumination that fuels depressive episodes. Psychologically, by transforming micro-farming from a stressful financial obligation into a voluntary, mindful space for leisure and personal growth, participants experienced an improved sense of agency. This transition successfully buffered livelihood anxieties while reinforcing household food security through tangible crop yields. Furthermore, the structured, group-centered environment of the sessions built vital social capital and peer support networks among the young adults, providing mutual validation and deep local ties that directly countered the chronic isolation associated with poverty-induced distress.

Despite the strength of the statistical outcomes, certain structural limitations must be acknowledged to guide future scholarly investigations. First, the active intervention window was limited to an eight-week cycle, which prevents the assessment of long-term psychological maintenance or potential symptom relapse over time. Second, the study relied strictly on self-reported psychometric feedback via the PHQ-9 instrument, which introduces potential vulnerabilities related to social desirability bias or subjective errors among participants. Finally, because individuals experiencing severe clinical depression were safely excluded at baseline and referred to specialist medical networks, these findings cannot be generalized to severe clinical pathologies. To improve upon these constraints, future clinical trials should integrate longitudinal follow-up windows, such as six-month and twelve-month post-tests, to verify the long-term durability of the program. Researchers should also combine quantitative psychometrics with qualitative semi-structured interviews to capture the lived cultural experiences and nuances of the participants within the barangay system.

The practical implications of this research offer a clear operational template for rural health governance and evidence-based public policy. Municipal health offices and local leaders across Nueva Ecija can use this empirical data to justify integrating "Green Care" protocols into primary health delivery networks by utilizing vacant communal barangay plots for structured therapeutic micro-farming. This low-cost, decentralized framework directly supports the United Nations Sustainable Development Goal 3 (SDG 3): Good Health and Well-Being, specifically targeting the promotion



of mental health at the grassroots level. Furthermore, local youth councils *Sangguniang Kabataan* can leverage these findings to allocate Gender and Development (GAD) or local youth development funds toward establishing sustainable communal gardens. This strategy provides an affordable, accessible, and culturally tailored mental health model that effectively reduces institutional strain on traditional, overburdened healthcare centers.

This study provides conclusive empirical evidence that a structured, eight-week mindful micro-farming intervention significantly reduces depression severity among low-income young adults in rural Nueva Ecija. By effectively shifting the vast majority of participants from moderate clinical depression down to minimal or mild symptoms, the program demonstrates that nature-based, community-driven interventions can serve as powerful therapeutic tools. The uniform success of the program across multiple rural municipalities confirms that ecotherapy is highly scalable and adaptable to localized rural contexts. Ultimately, moving mental healthcare out of traditional clinical spaces and onto communal agricultural lands provides a viable alternative to standard psychological services. This approach successfully overcomes the financial constraints, geographical isolation, and deep-seated cultural stigmas that frequently isolate vulnerable rural populations from essential psychiatric support.

Based on the highly significant clinical findings of this research, it is strongly recommended that Municipal Health Offices (MHOs) and Rural Health Units (RHUs) formally integrate therapeutic gardening and green care protocols into their community wellness agendas, establishing communal plots as primary care mental health resources. Barangay councils should collaborate with local agricultural offices to secure land and provide organic farming inputs, ensuring that these therapeutic spaces remain sustainable and cost-free for vulnerable residents.

Additionally, the *Sangguniang Kabataan* (Youth Councils) should proactively allocate local youth development and Gender and Development (GAD) funds to establish and maintain these mindful farming plots, utilizing them as safe spaces for youth socialization, peer support, and stigma reduction. Academic institutions should partner with local government units to design standardized training manuals for Barangay Health Workers (BHWs), equipping them to monitor program participation and safety effectively. Finally, future researchers should build upon this framework by conducting longitudinal studies with six-month and twelve-month follow-ups to track the long-term durability of these psychological improvements, while also integrating qualitative methodologies to capture the deep, lived cultural experiences of participants.

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