

Impact of a caregiver empowerment intervention within an age friendly village model on depression and loneliness in older adults: A Quasi Experimental Study

Fredy Akbar K^{a*}, Syamsidar Syamsidar^b, Adi Hermawan^c

^a Department of Nursing, STIKES Marendeng Majene, West Sulawesi, Indonesia

^b Department of Nursing, Poltekkes Kemenkes Mamuju, West Sulawesi, Indonesia

^c Department of Nursing, STIKES Amanah Makassar, South Sulawesi, Indonesia

Received: 2026-02-04 ◦ Revised: 2026-03-20 ◦ Accepted: 2026-05-20 ◦ Published: 2026-06-06

ABSTRACT

Introduction: Depression and loneliness are major contributors to morbidity and reduced quality of life among older adults, particularly in rural community settings where access to mental health services is limited. Strengthening caregiver capacity may represent a scalable strategy to improve psychological wellbeing. This study aimed to evaluate the effectiveness of a community-based caregiver empowerment program in reducing depressive symptoms and loneliness among older adults living in an age-friendly village in Indonesia.

Research Methodology: A quasi-experimental nonequivalent pretest–posttest control group design was employed. Seventy-two community-dwelling older adults (n=36 in the intervention group; n=36 in the control group) were recruited using purposive sampling. The intervention consisted of a 6-week structured caregiver empowerment program including psychoeducation, therapeutic communication training, emotional support strategies, and supervised home visits. Depression was measured using the Geriatric Depression Scale (GDS-15) and loneliness using the UCLA Loneliness Scale. Data were analysed using paired and independent t-tests and multiple linear regression ($\alpha = 0.05$).

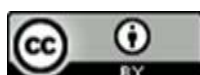
Results: The intervention group demonstrated significantly greater reductions in depressive symptoms ($\beta = -2.88$; 95% CI: -3.74 to -2.02; $p < 0.001$) and loneliness ($\beta = -3.97$; 95% CI: -4.98 to -2.96; $p < 0.001$) compared with the control group. Large effect sizes were observed for both outcomes.

Conclusion: The caregiver empowerment program was effective in improving psychological outcomes among community-dwelling older adults. Integrating structured caregiver training into age-friendly villages and primary health care services may provide a scalable, evidence-based strategy to strengthen mental health resilience in ageing populations.

Keywords: Aged; Caregivers; Depression; Loneliness; Mental Health.



*Correspondence author. Email: fredykabira@gmail.com



INTRODUCTION

Depression and loneliness are among the most consequential determinants of morbidity and mortality in older populations worldwide (Adıgüzel Yaşar et al., 2026). According to the World Health Organisation (WHO), approximately 14% of adults aged 60 years and older live with a mental disorder, with depression ranking as a leading contributor to years lived with disability (Badawy & Shaban, 2025). Loneliness, recently framed by WHO as a global public health priority, is associated with increased risk of cardiovascular disease, cognitive decline, frailty, and premature mortality (Bandyopadhyay, 2024). Meta-analytic evidence demonstrates that persistent loneliness increases mortality risk at a magnitude comparable to established behavioral risk factors such as smoking and physical inactivity. Despite this burden, mental health conditions in later life remain substantially underdiagnosed and undertreated, particularly in low- and middle-income countries (LMICs) (Bertin et al., 2025).

Indonesia is undergoing rapid demographic aging. National population projections indicate a marked increase in the proportion of individuals aged ≥ 60 years over the next two decades, positioning Indonesia among the fastest-ageing countries in Southeast Asia (Brice et al., 2025). Although national policies, including the Rencana Aksi Nasional Kesehatan Lanjut Usia 2020–2024, emphasise community-based elderly services, mental health integration within primary care and village-level programs remains limited. Epidemiological data suggest a substantial prevalence of depressive symptoms among Indonesian older adults, yet structured psychosocial interventions are rarely embedded within routine community health services (Burke et al., 2026). In rural provinces such as West Sulawesi, service fragmentation, shortage of geriatric mental health specialists, and reliance on informal family caregiving create systemic vulnerability for unaddressed depression and loneliness (Goldman et al., 2026). Preliminary observations in age-friendly village initiatives reveal that emotional isolation persists even among older adults living in multigenerational households, indicating that physical proximity does not equate to meaningful psychosocial support (Ernst et al., 2026).

The existing literature provides partial but insufficient solutions. Caregiver-focused interventions, particularly psychoeducation, skills training, and supportive counselling, have demonstrated effectiveness in reducing caregiver burden and improving care recipient outcomes (Hijrah et al., 2025). Systematic reviews indicate small to moderate reductions in depressive symptoms when caregivers receive structured training. Communication skills training has been associated with improved relational quality and emotional validation, while multicomponent programs integrating behavioral and educational elements show stronger effects than single-component interventions (Hua & Ma, 2024). However, several inconsistencies and limitations remain. First, the majority of trials are conducted in institutional or high-income settings, limiting the transferability of findings to community-dwelling older adults in LMIC rural environments (Kascakova et al., 2025). Second, many studies focus predominantly on dementia caregiving rather than broader geriatric mental health vulnerabilities, restricting applicability to heterogeneous elderly populations. Third, depression and loneliness are typically assessed independently, despite robust evidence demonstrating their reciprocal and reinforcing relationship. Fourth, few studies evaluate caregiver empowerment within structured age-friendly community models that integrate health, social participation, and local governance (Kastl et al., 2026).

These limitations indicate a clear research gap: there is insufficient controlled evidence evaluating whether a structured, community-based caregiver empowerment program can simultaneously reduce depression and loneliness among older adults residing in an age-friendly

village model in Indonesia. Moreover, the effectiveness of combining psychoeducation, therapeutic communication training, emotional support strategies, and supervised home visits within a single multicomponent intervention has not been rigorously tested in rural Indonesian contexts.

This study offers several novel contributions. First, it operationalizes caregiver empowerment within an existing age-friendly village framework, thereby aligning intervention delivery with established community infrastructure rather than external vertical programs. Second, it evaluates dual psychological outcomes depression and loneliness, within one integrated analytical model, acknowledging their interdependence. Third, the intervention incorporates structured home visits to enhance ecological validity and facilitate real-time skill transfer, addressing a common implementation weakness in classroom-based caregiver training. Fourth, by employing a nonequivalent pretest–posttest control-group design, the study strengthens causal inference in a real-world community setting where full randomisation is not feasible.

The objective of this study was to evaluate the effectiveness of a structured community-based caregiver empowerment program in reducing depressive symptoms and loneliness among community-dwelling older adults within an age-friendly village in Indonesia. Specifically, the study aimed to: (1) assess within-group changes in depression and loneliness following the intervention; (2) compare the magnitude of change between intervention and control groups; and (3) quantify the effect size of the empowerment program on both psychological outcomes. By generating context-specific empirical evidence, this research seeks to inform scalable, family-centred mental health strategies within Indonesia's village-based elderly care system.

RESEARCH METHODOLOGY

Study Design

This study employed a quasi-experimental design with a nonequivalent pretest–posttest control group. This design was selected to evaluate the effectiveness of a community-based caregiver empowerment program under real-world conditions where random allocation was not operationally feasible within the village administrative structure. The design allows assessment of temporal changes within groups and estimation of intervention effects through between-group comparison while maintaining ecological validity in a community setting.

Setting and Participants

The study was conducted in an officially designated age-friendly village in Palipi Soreang, Banggae District, Majene Regency, West Sulawesi Province, Indonesia. Data collection and intervention delivery were conducted over 7 weeks (baseline assessment, 6-week intervention, post-intervention assessment).

Eligibility Criteria

Inclusion criteria were: (1) aged ≥ 60 years; (2) residing in the selected age-friendly village; (3) having an identified primary family or informal caregiver willing to participate in the empowerment program; (4) able to communicate verbally in Bahasa Indonesia or the local dialect; and (5) providing written informed consent. Exclusion criteria were: (1) severe cognitive impairment that precluded valid questionnaire completion; (2) acute medical instability requiring hospitalization; (3) diagnosed severe psychiatric disorders under active specialist treatment; and (4) planned relocation during the study period.

Sampling Technique

Participants were recruited using purposive sampling based on eligibility criteria obtained from village health records (posyandu lansia registry). To minimize contamination, allocation to intervention and control groups was based on geographic sub-clusters within the village. Sample size was calculated using a two-sided hypothesis test for mean difference between two independent groups, assuming a medium-to-large effect size (Cohen's $d = 0.70$), power $(1-\beta) = 0.80$, and $\alpha = 0.05$. The minimum required sample was 34 participants per group. Anticipating 5% attrition, 36 participants were recruited per group, yielding a total sample of 72 older adults.

Variables and Measurement

The independent variable was participation in the community-based caregiver empowerment program (intervention vs usual care). Dependent Variables. Depressive symptoms, operationally defined as total score on the 15-item Geriatric Depression Scale (GDS-15), ranging from 0–15, with higher scores indicating greater depressive symptom severity. Loneliness, operationally defined as total score on the UCLA Loneliness Scale (validated Indonesian version), with higher scores indicating greater perceived loneliness.

Instrument Validity and Reliability

The GDS-15 has demonstrated strong psychometric properties in older populations, with reported Cronbach's $\alpha > 0.80$ and established construct validity. The UCLA Loneliness Scale short-form has demonstrated internal consistency (Cronbach's $\alpha > 0.85$) and convergent validity with depressive symptom measures. Both instruments have been previously validated in Indonesian older adult populations. Primary data were collected directly from participants through structured, face-to-face interviews conducted by trained research assistants who were blinded to group allocation.

Data Collection Procedures

Baseline assessments were conducted before intervention delivery (Week 0). The intervention group received a 6-week structured caregiver empowerment program consisting of psychoeducation sessions, therapeutic communication training, emotional support strategies, and supervised home visits. The control group continued receiving routine community elderly services. Post-intervention assessments were conducted in Week 7 using identical instruments and standardised procedures. Data collectors underwent standardised training on interview techniques and instrument administration. A pilot test was conducted to ensure procedural clarity. Completed questionnaires were double-checked for completeness. Data entry was performed using double-entry verification to minimize transcription errors. Blinding of assessors to group allocation reduced measurement bias.

Data Analysis

Data were analyzed using IBM SPSS Statistics version 25.0. Continuous variables were summarised using the mean and standard deviation (SD) for normally distributed data, or the median and interquartile range (IQR) when appropriate. Categorical variables were presented as frequencies and percentages. Bivariate Analysis. Within-group comparisons were performed using paired-samples t-tests. Between-group differences in change scores were analyzed using independent-samples t-tests. Assumptions of normality (Shapiro–Wilk test) and homogeneity of variance (Levene's test) were assessed before parametric testing. Multivariable Analysis. To adjust for potential confounders (age, sex, marital status, living arrangement, and baseline scores), multiple linear regression analysis was conducted for each outcome variable (post-test depression and loneliness scores). Intervention status was entered as the primary predictor, with baseline values and covariates controlled for. Regression diagnostics were performed to assess

multicollinearity and model fit. Statistical significance was set at $\alpha = 0.05$ (two-tailed). Effect sizes were calculated using Cohen's d to quantify the magnitude of intervention effects.

Ethical Approval

This study received ethical approval from the Institutional Research Ethics Committee of Politeknik Sandi Karsa, South Sulawesi, Indonesia, Indonesia number B-588/PT19.2.1/PP/VI/2025. All procedures were conducted in accordance with the Declaration of Helsinki and national research ethics guidelines. Written informed consent was obtained from all participants after explanation of study objectives, procedures, risks, benefits, confidentiality protections, and voluntary participation. Participants were informed of their right to withdraw at any time without consequence. Confidentiality was maintained using coded identifiers and secure data storage.

RESULT

A total of 72 older adults were included in the analysis (intervention = 36; control = 36). No attrition occurred during the study period (100% response rate). Baseline comparability between groups was assessed before outcome analysis.

Table 1. Baseline Characteristics of Participants (n = 72)

Variable	Intervention (n=36)	Control (n=36)	p-value
Age, mean $\pm$ SD (years)	67.3 $\pm$ 5.8	68.1 $\pm$ 6.2	0.604
Female, n (%)	22 (61.1%)	24 (66.7%)	0.623
Widowed, n (%)	18 (50.0%)	20 (55.6%)	0.637
Living with family, n (%)	31 (86.1%)	30 (83.3%)	0.743
Primary education or less, n (%)	28 (77.8%)	27 (75.0%)	0.781
Baseline GDS score, mean $\pm$ SD	8.45 $\pm$ 2.31	8.72 $\pm$ 2.18	0.604
Baseline loneliness score, mean $\pm$ SD	42.18 $\pm$ 5.67	41.94 $\pm$ 5.32	0.851

No statistically significant differences were observed between groups at baseline (all $p > 0.05$), indicating comparability before intervention.

Table 2. Analysis of Intervention Effects

Outcome	Mean Change (Intervention)	Mean Change (Control)	Mean Difference Between Groups	95% CI	p-value	Cohen's d
Depression (GDS-15)	-3.12 $\pm$ 1.54	-0.16 $\pm$ 1.21	-2.96	-3.82 to -2.10	<0.001	1.63
Loneliness	-4.45 $\pm$ 2.02	-0.26 $\pm$ 1.87	-4.19	-5.21 to -3.17	<0.001	1.78

The intervention group demonstrated significantly greater reductions in depressive symptoms and loneliness compared to the control group ($p < 0.001$). Effect sizes were large (Cohen's $d > 1.5$), indicating substantial clinical and statistical impact of the caregiver empowerment program.

Table 3. Linear Regression Analysis of Post-Test Outcomes (n = 72)

Variable	β (Unstandardized)	95% CI	p-value
Intervention (vs control)	-2.88	-3.74 to -2.02	<0.001
Baseline GDS score	0.61	0.42 to 0.79	<0.001
Age	0.03	-0.05 to 0.11	0.452
Female (vs male)	0.21	-0.64 to 1.06	0.624

Adjusted $R^2 = 0.64$

Model B: Loneliness (Post-Test Score)

Variable	β (Unstandardized)	95% CI	p-value
Intervention (vs control)	-3.97	-4.98 to -2.96	<0.001
Baseline loneliness score	0.58	0.44 to 0.72	<0.001
Age	0.05	-0.09 to 0.19	0.489
Female (vs male)	0.44	-1.02 to 1.90	0.548

Adjusted $R^2 = 0.69$

After controlling for sociodemographic factors and baseline scores, participation in the caregiver empowerment program remained a significant independent predictor of lower post-intervention depression ($\beta = -2.88$, 95% CI: -3.74 to -2.02, $p < 0.001$) and loneliness ($\beta = -3.97$, 95% CI: -4.98 to -2.96, $p < 0.001$). Baseline scores were also significant predictors of post-test outcomes. Sociodemographic variables were not statistically significant contributors in the adjusted models.

The caregiver empowerment intervention demonstrated statistically significant and clinically meaningful reductions in depressive symptoms and loneliness. Large effect sizes and robust adjusted regression coefficients indicate that the intervention effect persisted after controlling for potential confounders. Statistical analyses were conducted using IBM SPSS Statistics version 25.0 with a significance level of $\alpha = 0.05$ (two-tailed).

The findings demonstrate that the caregiver empowerment program produced statistically robust and clinically meaningful improvements in psychological outcomes among community-dwelling older adults. Baseline equivalence between groups strengthens internal validity and supports attribution of outcome differences to the intervention rather than pre-existing disparities. Analyses indicated large magnitude effects, with substantial reductions in depressive symptoms and loneliness in the intervention group relative to usual care. The observed effect sizes (Cohen's $d > 1.5$) exceed those commonly reported in community-based psychosocial interventions, suggesting a high practical impact of the multicomponent model. Regression analyses confirmed that the intervention effect remained significant after adjustment for sociodemographic factors and baseline outcome scores. The negative regression coefficients indicate an independent protective effect of program participation on post-intervention depression and loneliness. Baseline symptom severity emerged as the strongest predictor of post-test outcomes, while age and sex did not demonstrate significant associations. Overall, the analytical results provide convergent statistical evidence that structured caregiver empowerment delivered within an age-friendly village framework significantly improves mental health indicators among older adults, independent of key demographic covariates.

DISCUSSION

This study provides controlled evidence that a structured, community-based caregiver empowerment program significantly improves mental health outcomes among older adults residing in an age-friendly village. The intervention produced large and independent reductions in depressive symptoms and loneliness compared with usual community services. Importantly, the effects remained robust after adjustment for baseline scores and sociodemographic characteristics, indicating that the observed improvements cannot be explained by demographic composition or regression to the mean. These findings support the proposition that strengthening caregiver capacity is a viable upstream strategy for mitigating late-life psychological vulnerability in community settings.

Beyond statistical significance, the magnitude of the effect suggests that the intervention achieved a clinically meaningful change. The convergence between bivariate and multivariable findings reinforces internal validity and indicates a stable intervention signal across analytic models. Collectively, the results position caregiver empowerment not merely as supportive adjunct care but as a potentially central component of community-based geriatric mental health strategy (Kehoe & Van Orden, 2025).

First, Social Support Theory posits that emotional, informational, and instrumental support buffer stress and reduce vulnerability to psychological distress (Konstantinou et al., 2026). By enhancing caregivers' knowledge (informational support), communication competence (emotional support), and practical caregiving skills (instrumental support), the intervention likely increased both the quality and consistency of support available to older adults (Kumar et al., 2025). Improved perceived support may directly attenuate depressive cognitions and reduce subjective loneliness. Second, the Stress Process Model of caregiving suggests that caregiver competence mediates the impact of caregiving demands on both caregiver and care recipient outcomes (Kwon et al., 2025). When caregivers lack knowledge or communication skills, routine caregiving interactions may inadvertently reinforce emotional withdrawal or frustration. Empowerment interventions reduce secondary stressors by increasing role mastery and self-efficacy, thereby transforming caregiving interactions into protective relational experiences rather than sources of strain (C. Liu et al., 2025).

Third, from a Relational Regulation perspective, loneliness is not solely determined by network size but by the quality and emotional resonance of interactions. The intervention's emphasis on therapeutic communication and emotional validation likely improved relational depth rather than merely increasing contact frequency (H. Liu et al., 2026). This theoretical mechanism explains why loneliness declined despite participants already living in multigenerational households. Fourth, Ecological Systems Theory provides a broader systems-level interpretation. Rather than targeting only the individual older adult (microsystem), the intervention modified relational processes within the family unit while embedding them in a supportive community structure (mesosystem) (Özsoy et al., 2026). Delivering the program within an age-friendly village framework aligns interpersonal change with community norms and local governance structures, enhancing ecological coherence and sustainability (Qi et al., 2025). Taken together, these theoretical perspectives suggest that caregiver empowerment functions as a relational intervention that modifies proximal interactional dynamics, which in turn cascade into measurable psychological benefits (She et al., 2025).

Globally, caregiver-focused interventions have demonstrated modest effects on depressive symptoms among older adults, particularly in dementia care contexts (Somers et al., 2026). Meta-analyses from high-income countries typically report small to moderate effect sizes. The comparatively large effects observed in this study may reflect contextual factors unique to rural LMIC settings, where baseline service gaps create greater potential for measurable improvement (Sun et al., 2026). Unlike many Western trials conducted in institutional or clinic settings, this intervention was embedded in a community-village model. This aligns with emerging Southeast Asian evidence suggesting that culturally grounded, family-centred approaches may yield a stronger psychosocial impact than clinic-based models. In Indonesia and neighbouring countries, caregiving remains predominantly family-based; thus, interventions that enhance familial relational capacity may yield greater benefits than in more individualistic contexts (Suprpto et al., 2021).

Regional literature on age-friendly community initiatives has primarily focused on physical accessibility, social participation, and infrastructure. Few studies have empirically tested mental health outcomes within these frameworks (Ungureanu et al., 2025). This study contributes to a growing but still limited body of evidence demonstrating that age-friendly initiatives can be leveraged as platforms for structured psychosocial intervention rather than serving solely as policy labels. Moreover, many global studies examine depression and loneliness separately (Wang et al., 2026). By demonstrating simultaneous improvement in both outcomes within a single intervention, the findings support conceptual models that view these constructs as interrelated dimensions of late-life psychosocial vulnerability (Zhou et al., 2026). First, it reframes caregiver empowerment as a preventive mental health strategy rather than merely caregiver support. This repositioning shifts the analytic focus from caregiver burden reduction toward dyadic psychological outcomes and community mental health resilience. Second, it operationalises the age-friendly village model as an intervention-delivery platform. Rather than treating age-friendly designation as a symbolic policy, the study demonstrates how structured training modules can be integrated into existing community health infrastructure, including village health posts and local nurse-led services. Third, integrating structured home visits addresses a persistent translational gap in psychosocial intervention research: the disconnect between training acquisition and real-world skill implementation. Embedding coaching within the home environment enhances behavioral fidelity and contextual adaptation.

From a systems perspective, the findings suggest that primary health systems in ageing LMIC contexts may achieve greater impact by investing in caregiver capacity-building rather than relying solely on specialist-based service expansion. Given workforce shortages in geriatric psychiatry and clinical psychology, scalable nurse-led empowerment models offer pragmatic policy relevance. The intervention also aligns with universal health coverage principles by leveraging community assets, minimising reliance on tertiary facilities, and promoting family-centred continuity of care. Integration into routine posyandu lansia programming could institutionalize mental health promotion within village governance structures.

Strengths and Limitations

This study has several methodological strengths. The controlled quasi-experimental design enhances causal inference relative to single-group pre-post studies. Baseline equivalence between groups strengthens internal validity. The use of validated psychometric instruments improves measurement reliability. Complete participant retention eliminates attrition bias. Multivariable adjustment further supports the robustness of the intervention effect. First, non-random allocation introduces potential selection bias, although baseline comparability mitigates this concern. Second, the relatively short follow-up period precludes conclusions about the long-term sustainability of the effects. Third, reliance on self-reported measures may introduce response bias, particularly in collectivist cultural contexts where social desirability may influence reporting. Fourth, caregiver outcomes were not formally assessed, limiting insight into dyadic reciprocal benefits. Fifth, implementation fidelity was monitored but not quantified using standardised fidelity metrics. Finally, generalizability may be limited to rural community-based settings with strong family caregiving norms. Replication across diverse Indonesian provinces and urban environments is necessary before national-scale implementation. The present findings suggest that caregiver empowerment constitutes a theoretically grounded, systemically scalable, and empirically supported strategy for improving geriatric mental health within community-based aging frameworks. By shifting focus from individual symptom management to relational capacity

building, the intervention demonstrates a pathway toward sustainable psychological resilience in rapidly aging societies.

CONCLUSION

This study directly addressed its objective by demonstrating that a structured community-based caregiver empowerment program significantly reduces depressive symptoms and loneliness among community-dwelling older adults within an age-friendly village setting. The intervention effect remained robust after adjustment for baseline characteristics and sociodemographic factors, indicating that caregiver-focused capacity building independently contributes to improved psychological outcomes. These findings confirm that strengthening caregiver knowledge, communication skills, and emotional support competencies constitutes an effective strategy for mitigating late-life mental health vulnerability in rural community contexts.

From a policy perspective, caregiver empowerment should be integrated into routine primary health and village-based elderly care services, particularly within age-friendly community frameworks. Nurse-led training modules, combined with structured home visits, offer a scalable and resource-efficient model suitable for low- and middle-income settings with limited specialist availability. Institutionalising such programs within existing posyandu lansia structures and national ageing action plans may enhance sustainability and system-wide impact. Investment in caregiver training represents a pragmatic, evidence-based approach to advancing healthy aging and strengthening community mental health resilience.

Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. The study was conducted using the authors' institutional and personal resources.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this study.

Authors' Contributions

Fredy Akbar K conceptualised and designed the study, supervised the intervention implementation, conducted the data analysis, and drafted the manuscript. Syamsidar contributed to study design refinement, coordinated data collection, and assisted in data interpretation. Adi Hermawan supported the development of the intervention and the statistical review and critically revised the manuscript for important intellectual content. All authors reviewed and approved the final manuscript and agree to be accountable for all aspects of the work.

Acknowledgments

The authors sincerely thank the older adults and family caregivers in Desa Palipi Soreang, Banggae District, Majene Regency, West Sulawesi, for their active participation and trust. We acknowledge the support of the village government of Palipi Soreang, the Posyandu Lansia team, and the local Primary Health Center for facilitating coordination, data collection, and implementation of the caregiver empowerment program. Their collaboration was essential to the successful completion of this study.

References

- Adıgüzel Yaşar, Y., Gencer, S., İlhan, N., & Aştı, T. (2026). The relationships between frailty and depression, loneliness, and self-neglect in older adults: A cross-sectional study. *Archives of Psychiatric Nursing*, 60, 151997. <https://doi.org/10.1016/j.apnu.2025.151997>

- Badawy, W., & Shaban, M. (2025). The lonely swipe: Psychiatric nurses' experiences with technology-mediated social isolation in older adults with depression. *Archives of Psychiatric Nursing*, 59, 151987. <https://doi.org/10.1016/j.apnu.2025.151987>
- Bandyopadhyay, S. (2024). Loneliness and depression in older adults: living well in older age. *Medicine*, 52(11), 719–724. <https://doi.org/10.1016/j.mpmed.2024.08.009>
- Bertin, L., Katz, J. S., Deshpande, G., & Krueger, F. (2025). Beyond the human touch: A critical review of the promise and challenges of animal- and robot-assisted therapy in loneliness and mental healthcare. *Asian Journal of Psychiatry*, 110, 104615. <https://doi.org/10.1016/j.ajp.2025.104615>
- Brice, K. N., Paoletti-Hatcher, J., Wu-Chung, E. L., Lai, V. D., Argueta, D. L., Chen, M. A., Mahant, I., Denny, B. T., Green, C., Medina, L. D., Schulz, P., Stinson, J., Henry, S. K., Heijnen, C., & Fagundes, C. P. (2025). Heightened risk: Childhood trauma and anticipatory grief exacerbate the impact of loneliness on depressive symptoms and LPS-stimulated cytokines in dementia caregivers. *Psychoneuroendocrinology*, 179, 107523. <https://doi.org/10.1016/j.psyneuen.2025.107523>
- Burke, L., Christiansen, J., Lasgaard, M., Demkowicz, O., Verity, L., Lau, J. Y. F., & Qualter, P. (2026). Interventions to reduce loneliness in children and adolescents (4–18 years): A systematic review and meta-analysis with narrative synthesis of study-level characteristics. *Journal of Affective Disorders*, 403, 121445. <https://doi.org/10.1016/j.jad.2026.121445>
- Ernst, M., Petersen, J., Krakau, L., Reinwarth, A. C., Hettich-Damm, N., Hartmann, A., Wild, P. S., Münzel, T., Urschitz, M. S., Lackner, K., Pfeiffer, N., & Beutel, M. E. (2026). How the past shapes the present: Differential mental health trajectories in individuals with and without experiences of childhood abuse and neglect in the context of the COVID-19 pandemic. *Journal of Affective Disorders*, 399, 120907. <https://doi.org/10.1016/j.jad.2025.120907>
- Goldman, N., Alemdar, M., Megges, H., Matsumoto, N., Schoenmakers, E., van den Berg, P., Lasgaard, M., Christiansen, J., Junttila, N., Goldman, A., Draxl, D., El-Osta, A., & Qualter, P. (2026). National policy responses to address loneliness: A global scoping review of 194 WHO member states. *Health Policy*, 165, 105553. <https://doi.org/10.1016/j.healthpol.2025.105553>
- Hijrah, H., Norma Lala, N. S., Datu, N., Ruben, S. D., & Wang, S. L. (2025). Optimizing the Role of Family Nurses in Improving Community Health A Holistic Approach: Literature Review. *Jurnal Ilmiah Kesehatan Sandi Husada*, 14(1), 73–86. <https://doi.org/10.35816/jiskh.v14i1.1249>
- Hua, Z., & Ma, D. (2024). Purpose in life moderates the relationship between loneliness and caregiving stress among family caregivers of people with mental health problems. *Archives of Psychiatric Nursing*, 49, 99–105. <https://doi.org/10.1016/j.apnu.2024.02.009>
- Kascakova, N., Furstova, J., Hasto, J., & Tavel, P. (2025). Associations of multiple adverse childhood experiences, attachment insecurity and loneliness with physical and mental health difficulties in a representative Slovak sample. *Preventive Medicine Reports*, 50, 102982. <https://doi.org/10.1016/j.pmedr.2025.102982>
- Kastl, A., Fettke, U., & Dobusch, L. (2026). Experiences and social constructions of loneliness in later life: Collaborative focus group discussions in Germany. *Health Policy*, 166, 105575. <https://doi.org/10.1016/j.healthpol.2026.105575>
- Kehoe, L., & Van Orden, K. A. (2025). The Psychology of Social Isolation and Loneliness in Later Life. *Clinics in Geriatric Medicine*, 41(3), 307–327. <https://doi.org/10.1016/j.cger.2025.04.004>
- Konstantinou, G. N., Rosenblat, J., Hales, S., Husain, M. I., & Blumberger, D. M. (2026). Psilocybin in late-life mental health: Addressing depression, loneliness, and existential anxiety. *General Hospital Psychiatry*, 98, 54–63. <https://doi.org/10.1016/j.genhosppsych.2025.12.005>
- Kumar, A., Petriceks, A., & Schwartz, A. W. (2025). Social Isolation and Loneliness Among Older Adults. *Clinics in Geriatric Medicine*, 41(3), 289–306. <https://doi.org/10.1016/j.cger.2025.05.002>
- Kwon, K. Y., Nam, N., & Kim, J. (2025). Adolescent loneliness and later-life depressive symptoms: The intersecting roles of gender and socioeconomic status. *Social Science & Medicine*, 384, 118588. <https://doi.org/10.1016/j.socscimed.2025.118588>
- Liu, C., Liu, Y., Liu, C., Lin, R., Wang, X., Zhang, X., Wu, Y., & Wang, D. (2025). The Moderated Mediating Effects of Social Media Identity and Loneliness on the Relationship Between Problematic Internet Use and Mental Health in China: Nationwide Cross-Sectional Questionnaire Study. *Journal of Medical Internet Research*, 27, e57907. <https://doi.org/10.2196/57907>
- Liu, H., Peng, Z., Wong, E. L., Jim, C. Y., Li, L., & Hou, W. K. (2026). Built environment in early life is linked to heterogeneous trajectories of loneliness from childhood to adolescence in the ABCD study. *Health & Place*, 97, 103568. <https://doi.org/10.1016/j.healthplace.2025.103568>
- Özsoy, E., Griffiths, M. D., Onay, Ö. A., Karaçay, G. T., Koç, S., Erol, S., Cohen, A., & Ardiç, K. (2026).

- The predictive roles of Dark Triad, Big Five personality traits, loneliness, and attachment to caregivers in social media addiction: A cross-national study in Türkiye and Kyrgyzstan. *Personality and Individual Differences*, 252, 113598. <https://doi.org/10.1016/j.paid.2025.113598>
- Qi, X., Liu, R., Ko, E., Pei, Y., & Wu, B. (2025). Buffering Effects of Internet Use on Caregiving-Related Health Impacts and Loneliness Among Older Informal Caregivers in California: Cross-Sectional Study. *JMIR Aging*, 8, e74209–e74209. <https://doi.org/10.2196/74209>
- She, R., Newman, S. P., Kang, A., Choo, J. C. J., Khoo, E., Nandakumar, M., & Griva, K. (2025). Prognostication of Mental Health Risk Clusters on Hospitalization and Mortality in Patients With Coexisting Diabetes and Kidney Failure: The Hidden Burden of Loneliness. *Kidney Medicine*, 7(11), 101099. <https://doi.org/10.1016/j.xkme.2025.101099>
- Somers, J. C., Munsell, D. S., & Kilgore, J. R. (2026). Depression, Loneliness, and Estrangement in the Geriatric Population. *Physician Assistant Clinics*, 11(1), 1–12. <https://doi.org/10.1016/j.cpha.2025.08.001>
- Sun, L., Liao, Y., Gu, Z., Wan, X., & Liu, N. (2026). The association among social participation, loneliness and depression in stroke survivors: A longitudinal cross-lagged panel analysis. *Journal of Psychosomatic Research*, 203, 112553. <https://doi.org/10.1016/j.jpsychores.2026.112553>
- Suprpto, S., Mulat, T. C., & Lalla, N. S. N. (2021). Nurse competence in implementing public health care. *International Journal of Public Health Science (IJPHS)*, 10(2), 428. <https://doi.org/10.11591/ijphs.v10i2.20711>
- Ungureanu, F. A., Parnes, M. F., Superka, J. E., Hasson-Ohayon, I., Figueroa-Restrepo, C., Maya, M. F. P. Y. M., Romero, S. A., Jiwani, Z., Horesh, D., & Brown, A. D. (2025). COVID-related loneliness moderates associations between latent profiles of emotion regulation and mental health. *Psychiatry Research Communications*, 5(4), 100233. <https://doi.org/10.1016/j.psycom.2025.100233>
- Wang, X., Zhou, W., Yu, J., Chen, H., & Wang, C. (2026). Adverse childhood experiences and loneliness trajectory in middle-aged and older adults: A network analysis approach. *Public Health*, 253, 106199. <https://doi.org/10.1016/j.puhe.2026.106199>
- Zhou, Y., Rees, J., Matcham, F., Patel, A., Antonelli, M., Tinker, A., Ourselin, S., & Liu, W. (2026). Development and User-Centered Evaluation of Smart Systems for Loneliness Monitoring in Older Adults: Mixed Methods Study. *Journal of Medical Internet Research*, 28, e81027. <https://doi.org/10.2196/81027>