

## Effectiveness of Brief Behavioral Activation for Improving Social Connectedness in Lonely Older Adults

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### ABSTRACT

Loneliness among older adults is a common psychosocial problem that negatively affects social connectedness, emotional well-being, and quality of life. This condition is often exacerbated by the loss of a spouse, limited daily activities, and reduced meaningful social interactions. This study aimed to examine the effectiveness of *Brief Behavioral Activation for Improving Social Connectedness* (BBAISC) in enhancing social connectedness and reducing loneliness among older adults. This study employed a quantitative approach using a pre-experimental design with a *Single Case Experimental Design* (pretest–posttest). The participant was a 60-year-old older woman who experienced loneliness following the loss of her spouse and lived alone, with limited social support from family members and community health volunteers. The participant was selected using a purposive sampling technique. Research instruments included participant interviews, interviews with a significant other (community health volunteer), behavioral observation, the UCLA Loneliness Scale, the 16 Personality Factors (16PF) Test, and graphic tests (DAP and BAUM). The intervention was delivered individually over six weekly sessions, which included guided discussions, identification of personal values, activity monitoring and scheduling, gradual social activation, strengthening social support, and evaluation of behavioral changes. Quantitative data were analyzed using the Wilcoxon Signed-Rank Test due to non-normal data distribution based on the Shapiro–Wilk test. The results showed a significant difference between pretest and posttest scores ( $Z = -2.830$ ;  $p = 0.005$ ), indicating a reduction in loneliness following the intervention. This study concludes that BBAISC has the potential to be an effective and practical psychosocial intervention for reducing loneliness and improving social connectedness among older adults.

**Keywords:** *Older Adults, Loneliness, Brief Behavioral Activation For Improving Social Connectedness (BBAISC), Psychosocial Intervention.*

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## INTRODUCTION

The aging process is ideally characterized by sustained social engagement, a sense of meaning, and optimal psychological well-being. The Active Ageing framework proposed by the World Health Organization (WHO, 2015) emphasizes that older adults are expected to remain socially active in order to maintain quality of life as well as mental and physical health. However, in reality, many older adults face various limitations that increase the risk

of social isolation and loneliness. Declining physical health conditions, such as reduced mobility and chronic illnesses, along with changes in social networks, including living alone and decreased contact with family members or friends, significantly contribute to the emergence of loneliness among older adults (Asante et al., 2022). This condition is reflected in the study participant, a 60-year-old woman who lives alone following the loss of her spouse. The participant exhibited withdrawal from social activities, weight loss, sleep disturbances, and feelings of emptiness when alone. The gap between the ideal condition of active aging and the reality of functional limitations and reduced social roles positions loneliness as a significant psychosocial problem that requires appropriate psychological intervention.

Loneliness is a subjective experience that arises when there is a discrepancy between desired social relationships and those actually possessed by an individual (Russell et al., 1983). Russell and colleagues conceptualized loneliness as consisting of two primary dimensions: emotional loneliness and social loneliness. Emotional loneliness refers to the absence of close, intimate relationships that provide attachment, security, and emotional support, whereas social loneliness relates to limited social networks and a lack of engagement in meaningful social relationships. These two dimensions may co-occur and contribute to decreased psychological well-being among older adults. Quantitative evidence indicates that loneliness among older adults is a prevalent phenomenon across countries. A global systematic review and meta-analysis reported that approximately 27.6% of older adults worldwide experience loneliness, with prevalence rates varying according to measurement methods and cultural contexts (Salari et al., 2025). In Indonesia, analysis of data from the fifth wave of the Indonesian Family Life Survey (IFLS-5) revealed that approximately 11.2% of older adults experience high levels of loneliness. Factors such as low educational attainment, life dissatisfaction, and poor sleep quality were found to be significantly associated with loneliness among older adults (Asri et al., 2025). Furthermore, a community-based study in Kendari City reported that approximately 64% of older adults experienced loneliness based on a single-item loneliness measure, highlighting loneliness as a serious mental health issue among the Indonesian older population (Susanty et al., 2022).

If not appropriately addressed, loneliness among older adults can lead to various negative mental and physical health outcomes. Empirical evidence shows that loneliness is strongly associated with an increased risk of psychological disorders, including depression and anxiety, as well as reduced quality of life and subjective well-being in older adults (Hawkley & Cacioppo, 2010). In addition, loneliness is linked to declines in functional ability, more severe sleep disturbances, and a higher risk of general physical health problems (Salari et al., 2025). These conditions tend to reinforce a cycle of social isolation and withdrawal from the social environment, further exacerbating psychosocial well-being among older adults. The experience of loneliness in later life is influenced by various internal and external factors. Internal factors, such as personality traits, have been shown to be associated with loneliness in old age. Older adults with higher levels of neuroticism tend to report greater loneliness, whereas extraversion is negatively associated with loneliness (Ormstad et al.,

2020). External factors also play a critical role, including the loss of a spouse, changes in family structure, and reduced meaningful social interactions, which have been consistently identified as key determinants of loneliness in demographic and sociological studies.

Various interventions have been developed to address loneliness among older adults, including cognitive-behavioral therapy, reminiscence therapy, and group-based social interventions. These interventions have been shown to effectively reduce loneliness and improve psychological well-being among older adults. However, many of these approaches require relatively long intervention durations, group participation, and resources that are not always available in primary health care settings (Goodman et al., 2015). Therefore, there is a need for more concise, structured, and individually applicable intervention approaches. One promising approach is Brief Behavioral Activation for Improving Social Connectedness (BBAISC), a modification of Behavioral Activation that specifically focuses on increasing engagement in meaningful activities and social relationships. This approach emphasizes the relationship between behavior, activity, and emotional well-being and is designed to accommodate the physical and social limitations experienced by older adults (Pepin et al., 2021). The novelty of this study lies in the individual application of BBAISC for older adults experiencing loneliness as an effort to enhance social connectedness and reduce loneliness. Based on the above rationale, this study aims to examine the effectiveness of Brief Behavioral Activation for Improving Social Connectedness in reducing loneliness and enhancing social connectedness among older adults. The research hypothesis posits that there is a significant difference in loneliness levels before and after the implementation of the BBAISC intervention.

## **METHOD**

**Research Design.** This study employed a quantitative approach with a pre-experimental research design. The design used was a Single-Case Experimental Design (SCED) with a pretest–posttest model, aimed at comparing the participant’s condition before and after the implementation of the Brief Behavioral Activation for Improving Social Connectedness (BBAISC) intervention. **Participant.** The research participant was a 60-year-old woman residing in Surabaya who had been experiencing loneliness following the loss of her spouse approximately four years prior to the study. She lived alone, had limited social interactions, and exhibited symptoms of both emotional and social loneliness. The participant was selected through purposive sampling based on criteria including being 60 years or older, experiencing loneliness, living alone, and being willing to participate in the entire intervention process.

**Research Instruments.** The instruments used to obtain baseline data and post-intervention evaluations included: (1) Semi-structured interviews with the participant to explore emotional conditions, experiences of loneliness, and life history. (2) Significant other interviews (posyandu cadre) to obtain additional information regarding changes in the participant’s behavior and social functioning. (3) Behavioral observation to identify nonverbal expressions, interaction patterns, and emotional responses during the assessment and intervention process. (4) UCLA Loneliness Scale Version 3, used as the

primary measure of loneliness. This standardized instrument demonstrates high internal consistency ( $\alpha = 0.89-0.94$ ) and good construct and convergent validity. (5) 16 Personality Factors Questionnaire (16PF), administered to identify personality characteristics associated with loneliness tendencies and emotional responses. (6) Projective graphic tests (Draw-A-Person and BAUM) to explore emotional conditions and psychological needs.

**Intervention Procedure.** The Brief Behavioral Activation for Improving Social Connectedness intervention was delivered individually over six weekly sessions, each lasting approximately 60 minutes, and conducted face-to-face at a community health center. The intervention procedures included psychoeducation and therapeutic rapport building, identification of life values and meaningful activities, activity monitoring and scheduling, gradual social activation, reinforcement of adaptive coping strategies, and evaluation and maintenance planning. **Data Analysis Technique.** Data were analyzed using quantitative descriptive analysis to compare the participant's condition before and after the intervention. In addition, the Wilcoxon Signed-Rank Test was employed to examine differences between pretest and posttest loneliness scores, as the data were not normally distributed.

## **RESEARCH RESULT**

### **Characteristics of the Participant**

The participant was a 60-year-old woman residing in Surabaya who had been living alone since the death of her spouse four years prior due to a chronic illness. She has two children: a married daughter living in Jakarta and a son currently attending university. Since the loss of her spouse, the participant experienced significant changes in her social and emotional functioning. Previously active and socially engaged, she gradually reduced her activities outside the home due to declining physical condition and increasing fatigue. At the time of assessment, the participant spent most of her time alone at home and reported limited interaction with her surrounding environment.

### **Behavioral Observation Results**

Behavioral observation indicated that the participant appeared neat and well-groomed but physically fatigued, with a slightly stooped posture. Facial expressions were predominantly subdued and melancholic. Speech was soft with a slow tempo, and eye contact was limited, particularly when discussing family-related topics. The participant showed signs of emotional vulnerability, including tearfulness, especially when recounting experiences related to loneliness and health concerns. Despite initial guardedness, the participant became more open and cooperative as the session progressed, particularly when the interviewer demonstrated empathy.

### **Interview Results**

#### **a. Participant Interview**

The semi-structured clinical interview revealed persistent feelings of loneliness, particularly during nighttime. The participant reported sleep disturbances, frequent

awakenings, and the habitual use of television sound to reduce feelings of emptiness. Emotionally, the participant described sadness, feelings of emptiness, and worry about her children’s future and her own health. Socially, she reported withdrawal from community activities despite a desire to socialize, which was often inhibited by fatigue and fear of social judgment.

b. Significant Other Interview (Community Health Volunteer)

Information from the community health volunteer corroborated these findings. The volunteer reported that the participant had become increasingly withdrawn, less communicative, and less involved in community and posyandu activities over recent months. Emotional sensitivity and frequent tearfulness were also observed, particularly when discussing family-related issues.

**UCLA Loneliness Scale (Pretest)**

Based on the UCLA Loneliness Scale Version 3, the participant obtained a pretest score of 51, which falls within the moderate–high loneliness range (50–64), indicating significant emotional and social loneliness.

Personality Assessment Results (16 Personality Factors)

**Table 1. Relevant 16PF Results Related to Loneliness**

No	Factor	STD	Category	Interpretation
1	A – Warmth	4	Average	Social relationships present but emotionally limited
2	H – Social Boldness	4	Average	Passive social engagement, low initiation
3	L – Vigilance	10	High	Distrust, interpersonal caution
4	O – Apprehension	3	Low	Loneliness not driven by anxiety
5	Q1 – Openness to Change	1	Low	Difficulty adapting to new social roles
6	Q2 – Self-Reliance	4	Average	Need for closeness restrained by distrust

The 16PF results indicate that the participant demonstrates generally adequate social capacity, reflected in average levels of Warmth and Social Boldness; however, social engagement tends to be passive with limited initiation of interaction. A markedly high score on Vigilance suggests interpersonal distrust and cautiousness, which may hinder the formation of close and meaningful relationships. Low scores on Apprehension indicate that feelings of loneliness are not primarily driven by anxiety, while low Openness to Change reflects difficulty adapting to new social roles in later life. Overall, the pattern suggests an underlying need for social closeness that is restrained by distrust and limited behavioral flexibility, contributing to persistent loneliness despite the presence of basic social functioning.

Draw-A-Person (DAP)

**Table 2. Interpretation of the Draw-A-Person (DAP) Test**

<b>a. Formal Interpretation</b>		
No	Data	Interpretation
1	Drawing position: above the midline	Indicates an effort to present a relatively strong and well-functioning self-image as an adult individual. In older adults, this position may also reflect a compensatory mechanism to conceal internal vulnerability and feelings of loneliness.
2	Drawing size: small	Reflects a diminished self-image, feelings of helplessness, and a tendency toward social withdrawal. In older adults, a small figure is often associated with a reduced sense of meaning and limited social engagement, consistent with experiences of loneliness.
3	Line quality: discontinuous	Suggests hesitation and emotional instability. The participant appears to restrain emotional expression and affective impulses, which may hinder openness in interpersonal relationships.
4	Overall impression: vague/blurred	Reflects self-uncertainty, underlying anxiety, and emotional exhaustion. This condition may lead to withdrawal from the social environment as a form of self-protection.
5	Facial expression: smiling	Indicates an effort to display a positive emotional state to others. However, this expression functions as a defensive mechanism to mask feelings of emptiness, loneliness, and unmet emotional needs.
6	Drawing sequence: drawn later	Suggests that self-figure and social relational aspects are not a primary focus. This reflects emotional distance from the environment and low levels of social involvement.
<b>b. Content Interpretation</b>		
No	Data	Interpretation
1	Minimal facial details (absence of eyebrows, covered ears)	Indicates caution in communication and limited openness to external input. The participant tends to restrict interpersonal contact.
2	Disheveled hair	Reflects emotional tension and unresolved internal conflict that is not openly expressed.
3	Round eyes	Suggest a strong inward focus on internal experiences, commonly observed in individuals with restricted social interaction.

4	Prominent mouth	Indicates a need for acceptance, attention, and affection, accompanied by difficulty expressing these needs directly.
5	Long and thin neck	Reflects strong but fragile self-control and difficulty integrating thoughts and emotions.
6	Relatively short arms and legs	Suggest feelings of limited agency and reduced initiative in forming social relationships.

Based on the Draw-A-Person (DAP) results, the participant demonstrates psychological dynamics characterized by caution, emotional withdrawal, and strict emotional control. Although the participant attempts to present a positive and stable self-image externally, there are strong indications of insecurity, self-doubt, and unmet affective needs. The small figure size, unstable line quality, and delayed drawing sequence of the human figure reflect reduced social engagement and emotional distance from the environment. This pattern is consistent with experiences of loneliness in older adulthood.

#### BAUM Test (Tree Test)

**Table 3. Interpretation of the BAUM (Tree Test)**

No	Data	Interpretation
1	Drawing position: above the midline	Indicates an effort to maintain a positive self-image, aspirations, and self-control. In older adults, this may also reflect a compensatory response to emotional fragility and loneliness.
2	Drawing size: small	Reflects feelings of insecurity, diminished sense of personal significance, and a tendency toward social withdrawal.
3	Line pressure: moderate	Suggests adequate self-control and adaptive functioning, achieved by restraining emotional expression.
4	Shading: light	Indicates high emotional sensitivity and an unmet need for safety and emotional comfort.
5	Roots: spread laterally at the base	Reflect a strong need for stability and belonging, as well as difficulty establishing a sense of security within the social environment.
6	Trunk: sharp/angular (spitsoekig)	Suggests emotional reactivity, defensiveness, and heightened vigilance toward the environment, leading to interpersonal distance.
7	Crown: relatively small	Indicates limitations in affective expression and meaningful social relationships.
8	Branches and leaves: clearly drawn	Reflect a need for recognition, attention, and social acceptance that has not been fully fulfilled emotionally.

Overall, the graphic test results (DAP and BAUM) reveal an imbalance between strong affective needs and limitations in establishing meaningful social relationships. The participant strives to appear independent, stable, and positive, yet underlying this presentation are feelings of loneliness, interpersonal caution, and emotional withdrawal. This pattern is characteristic of loneliness in older adults, where individuals remain functionally adaptive but experience emotional emptiness and limited relational closeness.

### Pretest–Posttest Analysis

#### a. Normality Test

The assumption of normality was examined prior to conducting the main statistical analysis. The Shapiro–Wilk test indicated that both pretest and posttest loneliness scores were not normally distributed, with significance values of  $p = 0.017$  for the pretest and  $p < 0.001$  for the posttest. Since both values were below the conventional significance threshold of 0.05, the data violated the assumption of normal distribution. Given the small sample size and the non-normal distribution of the data, the use of parametric statistical tests was deemed inappropriate. Therefore, a non-parametric alternative, namely the Wilcoxon Signed-Rank Test, was selected to examine differences between pretest and posttest scores.

#### b. Wilcoxon Signed-Rank Test Results

Table 4. Wilcoxon Signed-Rank Test

Statistic	Value
<b>Z</b>	-2.830
<b>p-value</b>	0.005

The Wilcoxon Signed-Rank Test was conducted to examine differences in loneliness scores before and after the Brief Behavioral Activation for Improving Social Connectedness (BBAISC) intervention. The results showed a statistically significant difference between pretest and posttest scores ( $Z = -2.830$ ;  $p = 0.005$ ), indicating a reduction in loneliness following the intervention. Most posttest scores were lower than the corresponding pretest scores, suggesting a consistent improvement pattern. These findings support the effectiveness of BBAISC in reducing loneliness among older adults.

### Summary of Research Results

The results demonstrate that the participant experienced a significant reduction in loneliness following the implementation of Brief Behavioral Activation for Improving Social Connectedness. Improvements were observed in emotional expression, social engagement, and perceived connectedness. These findings support the hypothesis that BBAISC is an effective psychosocial intervention for reducing loneliness among older adults.

## DISCUSSION

The results of this study indicate a significant reduction in loneliness among older adults following the implementation of the Brief Behavioral Activation for Improving Social Connectedness (BBAISC) intervention. Quantitatively, the participant's UCLA Loneliness Scale score decreased from pretest = 44 to posttest = 32, and the Wilcoxon Signed-Rank Test confirmed this reduction as statistically significant ( $Z = -2.830$ ;  $p = 0.005$ ), with most posttest scores lower than pretest scores, indicating a consistent improvement pattern. Qualitative follow-up data from the community health cadre supported these findings, showing that the participant engaged in meaningful activities such as completing a strimin handicraft project over approximately two months, resuming light physical activities including leisurely walks and neighborhood morning exercise, and gradually increasing social interactions with friends and family through in-person meetings, messages, and video calls. These changes reflect enhanced engagement in adaptive and value-based activities, supporting the core assumption of Behavioral Activation theory that systematically increasing meaningful behaviors can improve emotional well-being and disrupt patterns of avoidance and negative reinforcement (Lewinsohn, 1974). Contemporary Behavioral Activation models further emphasize that behavioral change serves as a primary mechanism for emotional improvement, particularly in individuals experiencing low motivation, social withdrawal, and diminished environmental reinforcement (Martell et al., 2010).

In Session 1, the participant understood the concept of loneliness and agreed to participate actively in the intervention. Session 2 involved identifying personal values and meaningful activities, which helped the participant reconnect with the desire to engage socially and pursue purposeful tasks. In Session 3, the participant monitored daily activities and scheduled light physical and creative tasks, including completing a strimin handicraft project over two months, reducing boredom and enhancing personal satisfaction. Session 4 focused on gradual social activation, leading the participant to resume outdoor walks, morning exercise, and invite peers to social activities. Session 5 strengthened family and friendship communication through phone and video calls, increasing emotional connectedness. Finally, Session 6 evaluated progress and established maintenance plans, with the participant demonstrating improved emotional well-being, reduced loneliness, and readiness to continue adaptive behaviors independently.

**Theoretical Mechanisms Underlying Intervention Effectiveness.** From a theoretical perspective, the effectiveness of BBAISC can be explained using (Weiss's 1973) conceptualization of loneliness, which distinguishes between emotional loneliness and social loneliness. Following the intervention, the participant exhibited reduced feelings of emotional emptiness and increased perceived emotional connectedness, indicating a decrease in emotional loneliness. Additionally, improvements in social initiative and participation reflect a reduction in social loneliness. These outcomes align with the behavioral-emotional linkage model, which posits that changes in observable behavior can precede and facilitate emotional change, particularly among individuals who experience withdrawal and reduced reinforcement from their environment (Ferster, 1973). Behavioral

Activation further conceptualizes this process as a systematic increase in positively reinforcing experiences that gradually restores emotional balance (Martell et al., 2010).

**Relationship to Previous Studies.** The findings of this study are consistent with prior research demonstrating that behavioral activation and social engagement–focused interventions are effective in reducing loneliness among older adults. (Pepin et al. 2021) reported that brief behavioral activation interventions targeting social connectedness were associated with increased social participation and improved emotional well-being in older populations. Similarly, (Cacioppo and Hawkley 2009) emphasized that interventions encouraging active social engagement are more effective in addressing chronic loneliness than passive or solely supportive approaches. The consistency between the present findings and previous studies suggests that enhancing adaptive social behavior is a key mechanism in reducing loneliness during later life.

**Novel Findings and Contributions.** In contrast to many previous studies that relied on group-based interventions or longer intervention durations, this study demonstrates that an individually delivered and time-limited intervention can still produce meaningful reductions in loneliness. This finding extends early behavioral theories proposed by (Lewinsohn 1974), which emphasize the cumulative impact of small but consistent behavioral changes. It also complements recent findings by (Pepin et al. 2021), highlighting the feasibility of brief and individualized behavioral activation approaches. Furthermore, despite the participant’s interpersonal vigilance and tendency toward social withdrawal, the intervention remained effective when aligned with personal values and individual capacities. This individualized adaptation represents a contribution that has been less emphasized in prior loneliness intervention research among older adults.

## **CONCLUSION**

The findings of this study indicate that the Brief Behavioral Activation for Improving Social Connectedness (BBAISC) intervention effectively reduced loneliness in the older adult participant. Before the intervention, the participant experienced significant emotional and social loneliness, including the loss of an intimate attachment figure after the death of her spouse, feelings of emptiness, and low emotional connectedness. She often felt bored, spent most of her time at home, turned on the television at night for company, limited social interactions with her children due to distance, and had minimal contact with friends. The participant also exhibited social passivity, withdrawal from community activities, and reduced daily engagement, which collectively contributed to low emotional well-being.

Over six structured sessions, the intervention addressed these issues systematically. Session 1 involved psychoeducation and engagement, helping the participant understand the nature of loneliness and the link between social inactivity and emotional distress. Session 2 focused on identifying personal values and meaningful activities, encouraging the participant to reconnect with her priorities, including family, independence, and social interaction. Session 3 guided the participant to monitor and schedule daily activities, resulting in the resumption of light physical exercises and the initiation of a strimin handicraft project, which provided a productive and rewarding use of

leisure time. Session 4 emphasized gradual social activation, enabling the participant to participate in neighborhood morning exercise and invite peers to social activities. Session 5 strengthened social connections through proactive communication with family and friends via phone and video calls, enhancing emotional support and a sense of being valued. Finally, Session 6 evaluated the participant's progress and established a maintenance plan to ensure sustainability of behavioral changes.

Quantitative analysis using the Wilcoxon Signed-Rank Test confirmed a significant reduction in loneliness scores ( $Z = -2.830$ ;  $p = 0.005$ ), with most post-test scores lower than pre-test scores, indicating a consistent pattern of improvement. Qualitative observations revealed that the participant not only regained interest and engagement in meaningful activities but also reported enhanced emotional well-being, increased confidence in social interactions, and a stronger sense of purpose in daily life. The participant demonstrated increased initiative in maintaining communication with family and friends, resumed physical activity, and completed creative projects, reflecting the core principles of Behavioral Activation theory: that systematic engagement in value-based activities can interrupt avoidance behaviors and reinforce positive emotional experiences. Overall, the study highlights that a time-limited, individually tailored intervention can produce meaningful reductions in loneliness, even among older adults with social withdrawal and previous interpersonal losses, emphasizing the importance of personal values, gradual activity activation, and social support in promoting emotional and social well-being.

### **Recommendation**

Based on the findings of this study, it is recommended that the participant continue to engage in meaningful activities regularly, such as handicraft projects, leisurely walks, and morning exercise, to maintain physical health and emotional well-being. The participant is also encouraged to sustain social interactions with family, friends, and neighbors through calls, video chats, or casual meetings, as this can further reduce feelings of loneliness and strengthen emotional connections. Additionally, managing time alone with calming or enjoyable activities, such as watching favorite programs, listening to religious broadcasts, or pursuing hobbies, is important to minimize feelings of emptiness. Family members should continue providing emotional support, positive reinforcement, and encouragement for the participant's independence and social involvement, while remaining sensitive to her emotional condition. For future research, it is suggested to replicate this intervention with a larger sample of older adults, explore its long-term effects, and investigate the integration of other psychosocial support methods to enhance the effectiveness of reducing loneliness and promoting overall well-being among the elderly population.

### **REFERENCES**

Asri, Y., Hartono, A., Murwani, A., Kristiarini, J., & Manga, Y. B. (2025). *Prevalence and associated factors of loneliness among older adults in Indonesia: Insights from the Indonesian Family Life Survey (IFLS-5)*. *Jurnal Ners*, 20(1), 9–16.

- Cacioppo, J. T., & Hawkley, L. C. (2009). *Perceived social isolation and cognition. Trends in Cognitive Sciences*, **13**(10), 447–454.
- Ferster, C. B. (1973). *A functional analysis of depression. American Psychologist*, **28**(10), 857–870.
- Goodman, C. C., et al. (2015). *Interventions for loneliness among older adults: A systematic review. Journal of Aging & Health*.
- Hawkley, L. C., & Cacioppo, J. T. (2010). *Loneliness Matters: A Theoretical and Empirical Review of Consequences and Mechanisms. Annals of Behavioral Medicine*, **40**(2), 218–227.
- Lewinsohn, P. M. (1974). *A behavioral approach to depression. In R. J. Friedman & M. M. Katz (Eds.), The psychology of depression: Contemporary theory and research (pp. 157–178).*
- Martell, C. R., et al. (2010). *Behavioral Activation for Depression: A Clinician's Guide. Guilford Press.*
- Ormstad, H., et al. (2020). *Personality traits and loneliness: Associations in later life. Journal of Gerontology & Geriatric Research.*
- Pepin, R., et al. (2021). *Brief Behavioral Activation for Improving Social Connectedness in Older Adults. Clinical Gerontologist.*
- Russell, D., Peplau, L. A., & Cutrona, C. E. (1983). *The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. Journal of Personality and Social Psychology*, **45**(1), 145–149.
- Salari, N., et al. (2025). *The global prevalence and associated factors of loneliness in older adults: A systematic review and meta-analysis. Humanities and Social Sciences Communications.*
- Salari, S., et al. (2025). *Association between loneliness, health outcomes and risk factors among older adults. Archives of Gerontology and Geriatrics.*
- Susanty, A., et al. (2022). *Community-based study on loneliness among older adults in Kendari City. Indonesian Journal of Public Health.*
- World Health Organization. (2015). *World report on ageing and health.*
- Weiss, R. S. (1973). *Loneliness: The experience of emotional and social isolation.*