



Educating Seniors Against Dementia Through Knitting Skills and Crossgenerational Collaboration

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ABSTRACT

The Rajut Asa Program is a community-based empowerment program aimed at improving the psychosocial well-being and cognitive health of the elderly while simultaneously engaging youth through intergenerational collaboration. Implemented in RW 01, Bidara Cina Village, East Jakarta, the program involved 16 elderly women and 4 Karang Taruna youth members. This initiative integrates three main components: craft-based therapy, intergenerational interaction, and local economic empowerment. The program's effectiveness was evaluated using a mixed-methods approach that combined pretest-posttest quantitative assessments with qualitative observations. The results showed significant improvements in the elderly participants' self-confidence, social support, and cognitive engagement, with an effect size of $d = 1.32$. The youth also demonstrated substantial increases in intergenerational empathy and leadership readiness, with an effect size of $d = 2.43$. Overall, the program effectively enhanced participants' cognitive activity, social involvement, and fine motor skills while laying the foundation for a sustainable creative economy model. This study contributes a novel holistic integration of therapeutic intervention, intergenerational collaboration, and creative economy development within a single community program. The findings hold significant public health policy relevance by demonstrating that low-cost, community-asset-based interventions can effectively address the escalating dementia crisis in resource-constrained settings. They offer scalable alternatives to expensive clinical interventions and contribute evidence for age-friendly community development strategies aligned with WHO guidelines on dementia risk reduction. This low-cost, asset-based program design—utilizing local skills and community assets—can be replicated in similar urban communities to promote elderly well-being and intergenerational cohesion.

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INTRODUCTION

Indonesia is entering a demographic transition phase toward an ageing population. Based on the 2025 Elderly Population Statistics, the number of people aged 60 years and above has reached 33.8 million ($\pm 12\%$ of the national population) and is projected to increase to 19.9% or 65.82 million people in 2045 (BPS, 2025; Bappenas, 2023; Kim et al., 2020). This change in age structure indicates the success of health development, but at the same time, it increases the risk of degenerative diseases, especially dementia (Lee et al., 2020; Suyanto et al., 2021). This demographic transformation has profound implications for health systems, social structures, and public policies that need to be anticipated comprehensively and planned (Yusuf & Nur, 2021; Smith & Brown, 2022; Nasution et al., 2020).

Urban areas such as DKI Jakarta face increasingly complex and multidimensional ageing challenges (Kencono et al., 2025; Supriyadi et al., 2025). East Jakarta is recorded as the region

with the highest number of elderly people in DKI Jakarta, with an estimated more than 300,000 elderly people in 2025 and a Life Expectancy Rate (AHH) of 76.27 years—higher than the national average of 72.29 years (BPS DKI Jakarta Province, 2024; BPS, 2025). This demographic condition contributes to the rising prevalence of chronic diseases and cognitive impairments. High population density, limited public space, fragmentation of family structures, and lack of social cohesion in urban environments create an ecosystem vulnerable to elderly social isolation, which is a major risk factor for cognitive decline and dementia.

Nationally, Indonesia faces significant demographic challenges related to rising dementia cases. The number of people with dementia is estimated to increase almost fourfold, from 1.03 million in 2015 to 3.98 million by 2050, if not accompanied by adequate preventive interventions (Cahaya et al., 2020; Fitriani et al., 2021). This projection positions Indonesia as one of the countries with the fastest growth in dementia cases in Southeast Asia, with a growth rate that exceeds the ability of health and social systems to adapt (Husain & Siregar, 2020; Yusuf & Hariyanto, 2021). Dementia not only impacts the decline of individual cognitive function—which includes progressive memory impairment, decreased decision-making ability, disorientation in time and place, and loss of independence in daily activities (Tarmizi & Aziz, 2020; Lee et al., 2021)—but also poses a significant and multidimensional socio-economic burden (Rohmawati & Basri, 2020; Diah et al., 2021).

When left unattended without structured and sustained interventions, the impact of dementia develops in complex and systemic ways across multiple levels. First, at the individual level, the increasing need for intensive long-term care leads to full dependence on caregivers for basic activities such as eating, bathing, dressing, and mobility. This loss of independence not only decreases quality of life but also reduces the dignity and self-esteem of the elderly. Second, at the family level, informal caregivers face heavy psychological and financial pressure. Various studies show that the rate of depression and burnout among caregivers reaches more than 50% compared to the general population, with treatment costs ranging from IDR 50–150 million per year per family in Indonesia (STRIDE Dementia Indonesia, 2022; Herlina, 2024). This burden includes direct costs such as treatment, care, and assistive devices, as well as indirect costs in the form of lost productivity for caregivers who must reduce or leave work to care for family members with dementia.

Third, at the national health system level, the country faces escalating costs for health and social services due to repeated hospitalizations, long-term medical management, and care facilities that are cost-prohibitive for most Indonesians (Chou et al., 2021; Lio & McKee, 2020). A health system not fully prepared for the dementia tsunami risks overload that could disrupt services for other conditions (Kong et al., 2020; Jolly & Wang, 2021). Fourth, social stigma toward dementia and accompanying behavioral challenges—such as agitation, wandering, and personality changes—contribute to family structure fragmentation, increased social isolation, and even neglect of older adults with dementia (Alzheimer's Disease International, 2021; Hong et al., 2020). Fifth, the loss of the elderly's potential socio-economic contributions reinforces perceptions of dependence, even though some elderly people retain the capacity to remain productive and meaningful in their communities if given the right support (Bourgeois et al., 2020; McCallum & Cumming, 2021).

Without structured, sustainable, and evidence-based community interventions, dementia has the potential to widen disparities in elderly well-being, create a highly vulnerable and

dependent group of seniors, and exponentially increase the burden on public health systems in the future. This condition risks diverting health resources from other diseases and reducing access to services for the wider population, creating inefficiencies in the allocation of limited resources. Therefore, preventing dementia through evidence-based, community-based, non-pharmacological interventions is a crucial and urgent public health strategy in the coming decades—especially in middle-income countries such as Indonesia, which have limited resources for expensive individualized clinical interventions.

At the local community level, especially RW 01, Bidara Cina Village, Jatinegara District, East Jakarta, participatory social mapping conducted in October 2025 identified three interrelated main problems requiring integrated intervention. First, elderly social isolation due to limited physical mobility, reduced social networks from the loss of life partners or peers, and a lack of space and meaningful social activities in the environment. This isolation significantly increases the risk of deteriorating physical and mental health, including depression, anxiety, and accelerated cognitive decline. Second, the lack of productive and meaningful activities leads to loss of social roles, self-identity, and sense of purpose, which in turn accelerates cognitive decline and worsens psychological well-being. Third, existing elderly programs lack psychosocial approaches; available activities remain predominantly clinical, such as routine health check-ups, and have not yet targeted non-pharmacological dementia prevention through structured cognitive, social, and physical activities.

Amid these complex challenges, community social assets that have not been optimally utilized (dormant assets) hold great potential for activation. Karang Taruna RW 01, Bidara Cina Village—which has been vacant for several years due to a lack of meaningful programs—PKK members with latent and undistributed knitting skills to younger generations, and untapped potential for cross-generational collaboration represent valuable social capital that can be mobilized for community-based solutions. Responding to these conditions, through a participatory social mapping process involving community leaders, PKK cadres, youth from the Youth Organization, and elderly representatives in October 2025, the research team designed an integrated intervention in the form of the Rajut Asa Program.

The program combines three mutually reinforcing pillars in a single intervention ecosystem. First, craft-based therapy using knitting for multidomain cognitive and fine motor stimulation. Knitting activities involve sustained concentration, working memory to remember patterns, executive functions for planning and problem-solving, and complex fine motor coordination. The scientific literature shows that craft-based therapy effectively slows cognitive decline by up to 30–50% in the elderly population (Van der Meer et al., 2021; Van der Meer et al., 2023). The neuroprotective mechanisms of these structured creative activities work through increased neuroplasticity, formation of cognitive reserves, and maintenance of neural connectivity in brain regions involved in complex cognitive functions.

Second, cross-generational collaboration designed to build an inclusive, reciprocal mentoring ecosystem, where the elderly serve as skill mentors and sources of wisdom, while youth act as learning facilitators, social companions, and innovation agents. This model not only provides instrumental support but also fosters exchanges of values, knowledge, and perspectives that enrich both generations. Quality intergenerational interactions have been shown to reduce negative aging stereotypes, improve empathy and social cohesion, and provide meaning and purpose for both age groups (Jarrott, 2011; Kaplan et al., 2017).

Third, activation of the creative economy through simple digital marketing, leveraging youth competence as digital natives to document, promote, and market knitted products made by the elderly. This component not only offers income potential to enhance elderly economic independence but also instills a sense of productivity, social contribution, and validation of elderly abilities in the digital era. This creative economy integration provides instrumental value that strengthens intrinsic motivation for creative and social activities.

The program is not merely a reactive response to existing problems but a proactive, evidence-based approach that positions the elderly as active agents in dementia prevention while revitalizing youth roles in the community and building sustainable social cohesion. Previous research has demonstrated the effectiveness of craft-based interventions in maintaining cognitive health. Studies show that involvement in creative activities such as knitting provides systematic cognitive stimulation through concentration, working memory, and fine motor coordination, contributing to cognitive decline prevention (Reynolds, 2010; Burt & Atkinson, 2012). Furthermore, intergenerational programs have proven to improve social support, reduce isolation, and enhance quality of life for elderly participants (Jarrott, 2011; Kaplan et al., 2017).

The innovation of the Rajut Asa Program lies in its holistic integration of multiple intervention components within one community-based framework that optimizes local assets. Unlike conventional elderly programs focused solely on clinical approaches or single-dimensional activities, Rajut Asa combines cognitive stimulation, psychosocial support, economic empowerment, and youth activation in a cohesive, mutually reinforcing model. This asset-based approach emphasizes mobilizing existing community strengths rather than deficits or external resources, creating a sustainable and replicable model for similar contexts. This study aims to evaluate the effectiveness of the Rajut Asa Program in improving psychosocial well-being among elderly participants and activating youth roles in community-based dementia prevention, with the hope of producing a replicable and scalable intervention model for urban contexts in Indonesia and other middle-income countries facing similar demographic challenges.

METHOD

The Rajut Asa program uses a mixed methods approach with a pretest-posttest design to comprehensively evaluate the impact of the program. The evaluation framework is designed based on the principles of theory-driven evaluation that integrates program logic models to map inputs, activities, outputs, short-term outcomes, and medium-term outcomes. The mixed methods approach was chosen because of its ability to combine the power of quantitative data in measuring the magnitude of change with the power of qualitative data in understanding the mechanisms, contexts, and subjective experiences underlying such changes.

A structured evaluation framework was developed to measure change in three key dimensions: (1) psychosocial dimensions that include self-confidence, social support, and emotional well-being; (2) cognitive dimensions that include cognitive engagement, concentration, and working memory through knitting activities; and (3) social dimensions that include social connections, intergenerational interactions, and community participation. Quantitative data were collected through structured questionnaires administered before and after the intervention with a time interval of 12 weeks. The quantitative instrument was

developed based on relevant theories and literature, then validated through expert review by two academics in the field of gerontology and communication, as well as pilot testing on an elderly group outside the research sample to ensure the readability, cultural relevance, and reliability of the items.

Qualitative data were collected through three complementary methods: participatory observation during program implementation to document group dynamics, interaction patterns, and behavior changes; open-ended questions in the posttest questionnaire to capture participants' subjective experiences and perceptions; and semi-structured interviews with selected participants to delve into transformative experiences and mechanisms of change. Triangulation of data from multiple sources allows for cross-validation of findings and a more holistic understanding of the program's effects.

The program involved 20 participants consisting of two groups with different roles and characteristics. The elderly group (n=16) consisted of female residents aged 64-75 years who were active members of the PKK (Family Welfare Development) in RW 01, Bidara Cina. Complete pretest-posttest data were available for 8 elderly participants due to attrition during the program period. The demographic characteristics of the elderly group include: average age of 69.5 years (SD=3.2); the majority have junior and senior high school education (75%); marital status of most widows (62.5%); and the majority live with children or grandchildren in extended family arrangements (87.5%). The youth group (n=4) consisted of members of the Youth Organization aged 15-23 years who acted as facilitators and companions, with complete data available for 3 participants. The characteristics of the youth group include: average age of 19 years; high school-college educational background; and minimal experience in social activities prior to the program.

Attrition occurred due to several factors including health issues preventing continued participation (3 elderly participants), family obligations requiring relocation or time commitment changes (2 elderly participants), and loss to follow-up for posttest data collection despite continued program participation (3 elderly participants and 1 youth participant). While attrition reduces statistical power, the 50% retention rate for elderly participants (8 of 16) and 75% retention rate for youth participants (3 of 4) remains acceptable for community-based intervention research, particularly given the voluntary nature of participation and the 12-week program duration.

Participants are recruited through purposive sampling based on established inclusion criteria to ensure fit with program objectives and full participation capabilities. The inclusion criteria for the elderly group include: (1) active membership in the PKK RW 01 organization for at least 6 months; (2) willingness to participate in the program for a full 12-week period; (3) not have severe cognitive impairment or physical illness that prevents participation in knitting activities; (4) the ability to communicate verbally and give informed consent; and (5) not participating in other structured cognitive programs that may be a confounding factor. Inclusion criteria for youth groups include: (1) membership in Karang Taruna RW 01; (2) willingness to commit as a facilitator during the program period; (3) adequate interpersonal communication skills; and (4) motivation to contribute to the welfare of the community.

The recruitment process is carried out through program socialization in PKK and Karang Taruna meetings, with an explanation of the program's objectives, activities to be carried out, the time commitment needed, and potential benefits for participants. A participatory approach

is used in the recruitment process to ensure participants understand and feel they own the program from the start. Written informed consent is obtained from all participants after they have received a full explanation of the program and their rights as a research participant, including the right to withdraw at any time without negative consequences.

For elderly participants, the evaluation measured five psychosocial and cognitive dimensions selected based on the literature on protective factors against dementia and the outcomes of craft-based programs. The dimensions measured include: (1) self-confidence, measured through 5 items that assess the perception of self-ability, courage to try new things, and confidence in social interaction; (2) social support, measured through 5 items that assess the perception of the availability of emotional, instrumental, and informational support from family, friends, and community; (3) cognitive engagement, measured through 5 items that assess the frequency and intensity of activities that stimulate cognitive functions such as problem solving, learning new skills, and creative activities; (4) emotional wellbeing, measured through 5 items that assess positive mood, life satisfaction, and emotional regulation; and (5) purpose fulfillment, measured through 5 items that assess the sense of purpose, the meaning of life, and the feeling of contributing to the community.

Each dimension was measured using a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree) which allows for a response gradation that is sensitive enough to detect changes. There are a total of 25 items to measure the five dimensions in the elderly group. For youth participants, the evaluation measured ten dimensions of social competence and leadership that were relevant to their role as facilitators and agents of community empowerment. The dimensions measured included: (1) intergenerational empathy, (2) social connections, (3) leadership readiness, (4) civic responsibility, (5) communication skills, (6) problem-solving skills, (7) emotional maturity, (8) cultural awareness, (9) teamwork skills, and (10) self-efficacy. Each dimension is measured with 3-4 items using a 5-point Likert scale, for a total of 35 items.

Both instruments are validated through a systematic process. First, content validity was obtained through an expert review involving two senior academics in the field of social gerontology and health communication who provided input on relevance, domain representation, and item clarity. Second, face validity and cultural appropriateness were obtained through pilot testing on 5 elderly and 2 young people outside the research sample, where pilot participants were asked to provide feedback on readability, language clarity, and the relevance of items to their experiences. Third, construct validity is obtained through the analysis of exploratory factors on pilot data which shows that the items measure the intended construct. Fourth, internal reliability was tested using Cronbach's alpha, with results showing good internal consistency for all dimensions ($\alpha > 0.70$). This validation process ensures that the instrument measures the relevant constructs accurately and can be understood by the target population.

The program is implemented in three phases that are designed sequentially and mutually supportive. Phase 1 (October-November 2025) is a participatory social preparation and mapping phase that involves community needs assessment, engagement with stakeholders, and identification of mobilizable local resources. This phase began with a coordination meeting with community leaders, RW chairmen, PKK administrators, and representatives of Karang Taruna to build consensus on the urgency and design of the program. Social mapping was

conducted through focus group discussions (FGDs) with PKK members and youth to identify specific needs, available community assets, and potential barriers. The results of the social mapping show that the elderly have basic knitting skills that need to be re-honed, youth have access to the internet and social media skills but lack experience in social service, and there is a Posyandu meeting room that can be used for program activities.

The preparation phase also includes the procurement of the necessary materials and tools such as multi-colored knitting yarns, crochet hooks of various sizes, simple knitting pattern manuals, and visual boards for demonstrations. This procurement was carried out through the contribution of program funds and self-help from PKK members, demonstrating community ownership of the program from the early stages. Coordination with Bidara Cina Village was carried out to obtain administrative support and formal legitimacy of the program. This phase also includes the recruitment and orientation of professional knitting instructors who will facilitate intensive training in the next phase.

Phase 2 (December 3, 2025) is a phase of intensive knitting training and health education which is carried out for one full day with a duration of 8 hours. The training is facilitated by three professional instructors who have experience teaching knitting for different age groups. The morning session (08.00-12.00) focused on knitting technique training which includes: introduction to tools and materials, basic techniques for holding heels and yarns, making initial knots (slip knots), basic stitching techniques (chains, single stitches, double stitches), how to read simple patterns, and finishing techniques. Learning uses a hands-on learning approach where each participant directly practices each technique with the guidance of the instructor and mentoring from the youth facilitator. The ratio of instructors and youth facilitators to elderly participants is maintained at around 1:4 to ensure adequate attention and effective learning.

The afternoon session (13.00-16.00) included the continuation of knitting training with a focus on making simple products such as coasters (coasters) and knitted flowers as the first project that can be completed in a relatively short time to provide a sense of achievement. This session also includes health education on dementia prevention delivered by public health students with materials including: introduction to dementia and its risk factors, the importance of cognitive stimulation through creative activities, the role of social support in cognitive health, a healthy lifestyle to prevent dementia (nutrition, physical activity, stress management), and the importance of early detection of cognitive disorders. Education is delivered in an interactive method using videos, visual images, and group discussions to accommodate a variety of learning styles and ensure good understanding.

Phase 3 (December 2025-February 2026) is a phase of continuous mentoring that is carried out for 12 weeks with regular meetings every week. Each weekly session lasts for 2-3 hours with a consistent but flexible structure according to the needs and progress of the participants. The structure of the weekly sessions includes: (1) opening and ice-breaking (15-20 minutes) to build a relaxed atmosphere and encourage socialization; (2) progress review and experience sharing (20-30 minutes) where participants share their work, challenges faced, and achievements; (3) learning new patterns or techniques (40-60 minutes) that are introduced gradually in accordance with the development of group skills; (4) knitting practice with mentoring (60-90 minutes) where participants work on their projects with support from youth facilitators and peer support from fellow participants; and (5) closure and reflection (10-15 minutes) to celebrate achievements and motivate for the following week.

During the mentoring phase, youth facilitators play an active role in providing technical assistance with knitting, progress documentation through photos and videos, WhatsApp group management for communication and support outside of face-to-face sessions, and initiating simple digital marketing through product posts on Instagram and Facebook social media. Visual documentation carried out by youth not only serves as a promotional medium but also as a reinforcement of the positive identity of the elderly as productive and creative individuals. Intergenerational interaction during mentoring creates a mutual and respectful relationship, where the elderly teach patience and perseverance while the youth introduce digital technology and new perspectives. This dynamic creates two-way learning that enriches both groups.

Quantitative data was collected through the administration of a structured questionnaire at two time points: a pretest was conducted one week before intensive training (end of November 2025) and a posttest was conducted one week after the completion of the 12-week program (early February 2026). The questionnaire administration is carried out face-to-face with assistance to ensure the understanding of the item and the completeness of the data. The researcher or research assistant reads each item and answer selection clearly, provides clarification when needed, and records the participants' responses. This method was chosen to accommodate the variation in literacy and visual abilities of elderly participants, as well as to ensure the accuracy and completeness of the data.

Quantitative data analysis was carried out using SPSS software version 25 with analysis procedures including: (1) descriptive statistics to describe the characteristics of participants and the distribution of pretest-posttest scores; (2) paired-samples t-test to compare the average pretest and posttest scores on each dimension and overall, assuming the normality of the data tested using the Shapiro-Wilk test; (3) the calculation of effect size uses Cohen's d to determine the magnitude of the change, with interpretation based on Cohen's convention ($d = 0.2$ small effect, $d = 0.5$ medium effect, $d = 0.8$ large effect); and (4) analysis of individual changes to understand the distribution of program impacts at the participant level and identify good versus less responsive responders to the program. Statistical significance was set at $\alpha = 0.05$ for all hypothesis tests.

Qualitative data was collected through three complementary sources that provide different perspectives on the program's processes and impacts. First, participatory observations were carried out by the researcher during all program sessions by recording field notes about group dynamics, interaction patterns, behavioral changes, emotional expression, and significant moments that arose during implementation. Observations focused on aspects that could not be captured by quantitative instruments such as the quality of interaction, spontaneity of participation, and the transformation of the group atmosphere over time. Second, open-ended questions in the posttest questionnaire asked participants to describe their experience in the program, the changes they felt, and what participation meant to them. These written responses provide first-person data about participants' subjective perceptions and experiences. Third, semi-structured interviews were conducted with 4 elderly participants and 2 youth participants who were purposively selected based on the variety of experiences and levels of involvement in the program to explore the mechanisms of change, challenges faced, and learnings obtained.

Qualitative data analysis uses a thematic analysis approach (Braun & Clarke, 2006) which includes the following stages: (1) familiarization with the data through repeated reading of transcripts and field notes; (2) initial coding by identifying units of meaning and providing

descriptive codes; (3) theme search by grouping related codes into potential themes; (4) theme review to ensure internal and external coherence; (5) the definition and naming of themes to capture the essence of each theme; and (6) the writing of findings by integrating representative quotes to illustrate each theme. The analysis was carried out iteratively with discussions between members of the research team to increase the trustworthiness of interpretation. Triangulation of data from multiple sources (observations, open-ended answers, interviews) is used to cross-validate findings and ensure the credibility of qualitative analysis.

RESULTS AND DISCUSSION

Overall Program Outcomes

The Knitting Asa program demonstrated significant and consistent positive impacts across all dimensions measured for both groups of participants. Table 1 presents comprehensive quantitative results showing substantial improvements in psychosocial well-being, cognitive engagement, and social functioning. These results provide preliminary empirical evidence on the effectiveness of a craft-based intergenerational intervention model for the urban elderly population in Indonesia.

Table 1. Overall Quantitative Results (n=11)

Participant Groups	Rata-rata Pretest	Posttest rate-rate	Increase (%)	Effect Size (d)
Elderly (n=8)	3,43	4,01	16,76%	1,32
Youth (n=3)	3,44	4,44	29,13%	2,43

The elderly group showed an average improvement of 16.76% across all dimensions measured, with an average pretest score of 3.43 increasing to 4.01 on a 5-point scale in the posttest. Cohen's effect size $d = 1.32$ indicates a large effect according to Cohen's conventions, which indicates a substantial and practically meaningful program impact. The magnitude of these changes exceeded the threshold for meaningful clinical change in the context of psychosocial interventions, indicating that the program not only produced statistically significant changes but was also relevant and meaningful in participants' daily lives. The youth group showed an even more striking improvement, with an average increase of 29.13% (from 3.44 to 4.44) and a very large effect size ($d = 2.43$). This very large effect size indicates a profound transformative impact on youth participants, beyond the program's initial expectations.

Importantly, all participants (100%) showed a positive change in their posttest scores compared to the pretest, with no decrease or stagnation. The consistency of this universal improvement indicates that the program is effective for a broad spectrum of participants, not just for specific subgroups. These findings demonstrate the robustness of the intervention and its ability to accommodate individual variations in demographic characteristics, baseline functioning, and learning pace. The absence of non-responders or negative responders also indicates that the program has no adverse effects and is well-tolerated by all participants.

Dimensional Analysis for Elderly Participants

Table 2 presents detailed results for each dimension measured in elderly participants. The analysis by dimension reveals an informative pattern of change about the specific mechanisms

through which the program operates and the functional domains that are most responsive to the intervention.

Table 2. Results per Dimension of Elderly Participants

Dimensions	Pretest	Posttest	Change (%)
Confidence	3,13	3,69	+17,95%
Social support	3,63	4,44	+22,22%
Cognitive engagement	3,31	4,21	+27,27%
Emotional well-being	3,44	3,91	+13,79%
Fulfillment of life goals	3,63	3,81	+5,00%

The highest increase was observed in the cognitive engagement dimension (27.27%), followed by social support (22.22%) and confidence (17.95%). These results are in line with the theoretical foundations of craft-based therapy that emphasizes systematic cognitive stimulation through concentration, working memory, and fine motor coordination. Knitting activities that are done in a structured and regular manner in the program provide optimal cognitive challenge—not so easy that it's boring, but not so difficult that it's frustrating. The level of difficulty that gradually increases along with skill development creates flow conditions conducive to deep cognitive engagement and sustained attention.

Substantial increases in cognitive engagement support the existing literature on craft-based therapy as an effective non-pharmacological intervention for cognitive health. Van der Meer et al. (2021; 2023) demonstrated that regular involvement in creative activities such as knitting can slow cognitive decline by 30-50% in the elderly population. Neuroprotective mechanisms work through multiple pathways. First, knitting activities involve multisensory integration (visual, tactile, proprioceptive) that activates various brain regions simultaneously. Second, learning new patterns and techniques encourages neuroplasticity through the formation of new neural connections and strengthening existing synapses. Third, the progressive mastery of increasingly complex skills builds a cognitive reserve that serves as a buffer against age-related brain pathologies. Fourth, the creative and problem-solving aspects of knitting activate executive functions involving the prefrontal cortex, a region that is particularly vulnerable to age-related decline.

The increase in social support reflects the program's success in reducing social isolation through structured group activities and meaningful intergenerational interactions. Social isolation is a significant risk factor for cognitive decline and dementia, with meta-analysis studies showing that socially isolated individuals have a 50% higher risk of developing dementia than socially engaged ones (Livingston et al., 2020). The Rajut Asa program overcomes isolation through multiple mechanisms. First, regular weekly meetings create a social routine that is reliably and positively anticipated by participants. Second, collaborative activities of knitting together facilitate peer support, shared learning, and reciprocal helping that strengthen social capital bonding. Third, interaction with youth facilitators creates a cross-generational social capital bridging that expands the participants' social networks. Fourth, youth-managed WhatsApp groups allow for continuous communication and support beyond face-to-face meetings, extending social connections to daily life.

Qualitative data from observations and interviews reveal that the quality of social connections formed goes beyond superficial pleasantries to meaningful relationships characterized by trust, mutual understanding, and genuine care. Elderly participants reported

feeling listened to, appreciated, and cared for by fellow participants and youth facilitators. The sense of belonging formed in the group provides an emotional anchor that is important for the psychological wellbeing of the elderly. As one participant put it: "Every Tuesday I look forward to the meetings, because there are friends who understand me and the younger brothers and sisters who patiently teach us. We feel like we're not alone." This quote illustrates the combination of peer support and intergenerational connection that is the program's distinctive feature.

The increase in self-confidence is noteworthy because it indicates enhanced self-efficacy—psychological resources that allow individuals to actively engage in health-promoting behaviors and face life's challenges more effectively. Mastery experiences from learning new skills and creating tangible products are the most powerful sources of self-efficacy according to Bandura's self-efficacy theory (Bandura, 1997). The program provides graduated mastery experiences ranging from simple projects such as coasters to more complex products such as knitted bags, allowing participants to experience success gradually and build confidence progressively. The vicarious experiences of seeing fellow participants successfully master a new technique also provide modeling that increases the belief that "if they can do it, so can I." Social persuasion from instructors and youth facilitators who provide encouragement and positive feedback strengthens self-efficacy beliefs. Positive physiological and emotional states during knitting activities—relaxed, focused, joyful—also contribute to enhanced self-efficacy.

Qualitative data reveal that the increase in confidence is not limited to the domain of knitting but is generalized to other areas of life. Participants reported feeling more confident to try new activities, express their opinions, and interact with others including the younger generation. One participant shared: "I used to be shy and insecure, but now I dare to try new things. If I could knit what I couldn't do now, I can learn other things as well." This transfer of learning indicates that the program not only teaches specific skills but also builds a growth mindset and a broader sense of agency.

The dimensions of emotional well-being and fulfillment of life goals also showed an increase albeit with a more modest magnitude (13.79% and 5.00% respectively). Improved emotional well-being reflects improved mood regulation and reduced negative affect as a result of engagement in enjoyable activities, supportive social connections, and a sense of accomplishment from productive activities. Knitting activities have meditative qualities that can reduce stress and anxiety, while simultaneously providing sufficient challenge to maintain engagement without overwhelming. This balance between relaxation and stimulation creates a positive emotional experience that accumulates over time to improve overall emotional wellbeing.

A more modest increase in life goal fulfillment may reflect the more existential nature of this construct and takes longer to change than more proximal outcomes such as cognitive engagement or social support. Purpose fulfillment is related to a deeper meaning of life and requires sustained engagement and reflection to fully develop. However, even a 5% increase indicates the beginning of a shift toward greater sense of purpose through contributions to the community through skill sharing, creation of meaningful products, and indirect mentoring to the younger generation. As one participant explained: "I feel that my life is still meaningful because I can teach others to knit and my work can be enjoyed by others. It makes me feel

valued." With the continuation program, this dimension is likely to show a more substantial improvement.

Impact on Youth Participants

Youth participants demonstrated remarkable improvements across all dimensions measured, with particular highlights on intergenerational empathy (35.48%), social connection (32.05%), and leadership readiness (30.77%). These results indicate that the program has successfully activated youth civic engagement and developed essential competencies for community leadership and social responsibility. Very large effect size ($d = 2.43$) showed a profound transformative impact on youth participants, exceeding expectations and demonstrating that intergenerational programming can be a powerful vehicle for positive youth development.

The development of intergenerational empathy represents a critical outcome for building age-inclusive communities that value the contributions of all generations. Youth participants reported dramatic improvements in understanding of the experiences of the elderly, the challenges they faced, and the strengths they had through direct and collaborative interactions. This is in line with Contact Theory (Allport, 1954) which postulates that meaningful contact between groups in cooperative conditions can reduce prejudice and increase empathy. The Rajut Asa program creates optimal conditions for positive intergroup contact: common goals (creating knitted products), equal status within the group (both generations contribute unique competencies), institutional support (endorsed by community organizations), and opportunities for personal acquaintance through regular prolonged interaction.

Qualitative data reveal a transformation of youth's perspective on the elderly and aging. Before the program, some youth admitted to having stereotypes about the elderly as "outdated," "difficult to learn new things," or "unproductive." Through direct experience accompanying the elderly, this stereotype is challenged and replaced with an appreciation for resilience, wisdom, and capacity for learning for the elderly. One young facilitator reflected: "At first I thought these mothers would be slow learners and give up easily. It turns out that they are very passionate, patient in the face of difficulties, and even more creative than me in combining colors. I have a lot of respect for their spirit." This kind of transformation is fundamental to building intergenerational solidarity which is essential in aging societies.

The increase in social connections for youth reflects expanded social networks through meaningful relationships with the elderly and fellow facilitators. Many urban youth experience limited interaction with older generations outside of their nuclear families due to geographic dispersion families and age-segregated social spaces. This program provided structured opportunities to build authentic relationships across generations that are enriching for both parties. The youth reported appreciating the wisdom, life experiences, and emotional support they received from the elderly participants, while the elderly valued the energy, fresh perspectives, and technological skills of the brought. Reciprocal nature of these relationships created genuine mutual benefit rather than one-directional helping relationship.

Enhancement in leadership readiness and civic responsibility indicates the effectiveness of the program in activating youth as community development agents. By assuming facilitator roles, youth participants developed practical skills in coordination, mentoring, conflict resolution, and community mobilization programs that are essential for effective leadership.

These experiential learning opportunities align with youth development principles that emphasize meaningful participation and contribution to community affairs as critical to positive development (Lerner et al., 2015). Youth reported feeling more confident in their abilities to make a positive difference, more aware of community needs, and more committed to civic engagement in the future.

One young facilitator described the leadership development journey: "In the past, I just joined the Youth Organization without knowing what to do. This program made me discover a passion to help others, especially the elderly. I learned how to communicate with them, overcome problems that arise, and motivate them when they feel difficult. This makes me feel more prepared to be a leader in the community." This narrative illustrates the transformative power of authentic youth engagement in meaningful community service that develops both competencies and sense of purpose.

Qualitative Findings and Program Mechanisms

Qualitative data from open responses, observations, and interviews provided rich contextual understanding of program mechanisms and impacts that complement and deepen insights from quantitative findings. The thematic analysis identified four main themes that emerged from the qualitative data of the elderly: (1) renewed sense of capability and productivity, (2) meaningful social connection and belonging, (3) intergenerational learning and mutual respect, and (4) emotional regulation through creative engagement.

The theme of renewed sense of capability emerged strongly in the narratives of the elderly who consistently reported feeling more capable, productive, and valuable after participating in the program. Representative quotes included: "My old brain can still learn new things," "My often sore hands can now make something useful," and "I feel like I'm still productive, not just sitting still waiting for time." These narratives underscore the program's success in challenging negative self-perceptions about aging and capabilities, replacing them with more positive self-image based on concrete achievements.

Meaningful social connection and belonging theme reflected importance of peer support and intergenerational relationships formed through the program. The elderly valued both horizontal connections with fellow participants who shared similar life stages and challenges, as well as vertical connections with youth who brought fresh energy and perspectives. Quotes illustrated the dual nature of these connections: "We became a group that supported and understood each other," "These young brothers and sisters did not consider us burdens but valued partners." Sense of belonging that developed within group addressed social isolation that is widespread among urban elderly.

For the youth participants, qualitative analysis revealed three dominant themes: (1) stereotype transformation and increased empathy, (2) skill development and leadership confidence, and (3) sense of meaningful contribution. Pemuda consistently described how direct interaction challenged initial stereotypes and developed deeper understanding of elderly experiences. One youth reflected: "I used to think that the elderly are passive and cannot be invited to collaborate in modern things such as online marketing. It turned out that they were very supportive of our ideas and even gave us insights that we didn't think about about the target market and product quality."

Skill development theme encompassed both technical skills (facilitating, teaching, documenting) and soft skills (patience, empathy, communication). Youth appreciated program sebagai learning ground untuk developing competencies yang relevant untuk future careers and civic roles. Sense of meaningful contribution reflected pemuda's satisfaction dari making tangible positive impact in their community, which contrasted dengan previous Karang Taruna activities yang often felt perfunctory atau disconnected dari real community needs.

CONCLUSION

The Rajut Asa program proved highly effective as a community-based intervention for dementia prevention and intergenerational empowerment in urban Indonesia, integrating craft-based therapy, cross-generational collaboration, and creative economy activation to yield substantial psychosocial well-being gains—16.76% for elderly participants ($d=1.32$) and 29.13% for youth ($d=2.43$)—with universal positive changes across all involved, addressing social isolation, cognitive decline risks, youth engagement, and economic needs via a low-cost, culturally attuned, asset-based model ideal for replication in ageing urban settings. For future research, longitudinal studies tracking sustained cognitive and socio-economic outcomes over 2–5 years, alongside randomized controlled trials in diverse Indonesian regions, would strengthen the evidence base and refine scalability for middle-income countries.

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