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THE EFFECT OF SUPPORTIVE EDUCATION NURSING INTERVENTION ON SELF-EFFICACY OF FAMILY CAREGIVERS CARING FOR DEPENDENT ELDERLY: RANDOMIZED CONTROLLED TRIAL

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Abstract

Objectives: This study aimed to examine the effect of supportive education nursing intervention (SENI) on the self-efficacy of family caregivers caring for dependent elderly.

Materials and Methods: This is a parallel and two-armed randomized control trial. The research was conducted in the work area of primary health facilities in Puskesmas Pasar Ikan with 8 sub-districts in Bengkulu. We recruited 52 family caregivers divided into intervention and control. The supportive educational nursing intervention included audio visual, module book, and worksheet that covered relevant parts of dependent elderly and family caregivers' self-efficacy. The study data were analyzed using chi-square, and independent t-test as well as analysis of variance.

Results: Before the intervention, the total score of family caregivers' self-efficacy was 90.19 and 94.58 in the intervention and control groups, respectively. After the intervention, it increased to 114.23 and 101.58 in the intervention and control groups, respectively, which was statistically significant in both groups ($p<0.001$). Moreover, the mean increase of 24.04 in the experimental group and the mean increase of 7.00 in the control group showed a significant difference between the two groups ($p<0.001$).

Conclusion: The SENI model is an effective way to increase the self-efficacy of family caregivers with dependent elderly. The SENI program can be effectively integrated into primary health services through tailored modifications that account for local contexts and specific healthcare needs.

Keywords: Caregivers, frail elderly, self-efficacy, education, home health nursing, randomized controlled trial.

Introduction

Family caregivers are partners, friends, relatives, or neighbors who help someone with physical, mental, or cognitive disabilities, and these services are usually provided unpaid.[1] In Indonesian culture, family members have an intimate bond with one another called "Ngabdi Wong Tuwo".[2] This cultural preference for independent patient care at home rather than at a hospital leads family caregivers to view this as self-dedication to parents.[3] Indonesian family caregivers require assistance with a range of duties. This entails giving direct care, controlling symptoms, giving emotional support, and handling money. Not only that, but family caregivers must also be able to act as patient advocates, interact with other members of the family, make decisions, navigate the healthcare system, and be ready for an uncertain future.[3,4] Consequently, long-term caregiving for dependents elderly may place a significant burden on other family members.[5]

The prevalence of family caregiver burden globally ranges from 25% to 54%, with evidence indicating that family caregivers in Indonesia typically experience a moderate level of burden in their caregiving roles.[5–7] Family caregiver burden can arise because of the caregiver's duties, negative consequences such as a role in providing care to patients, which causes high pressure felt by the family.[8] The caregiving burden diminishes caregivers' well-being and sleep quality due to the emotional and physical demands they experience.[9] In addition, the caregiving burden affects the quality of life and increases symptoms of depression among family caregivers.[10]

Self-efficacy is known to be able to have a positive influence on family caregivers in increasing confidence and ability to care for the elderly and can directly reduce psychological distress when dealing with various challenges in caring for the elderly.[11,12] Self-efficacy is a psychological factor that greatly influences stress tolerance and family caregiver skills in caring for sick family members.[13]

Self-efficacy is an important phenomenon in understanding the impact of the care tasks undertaken by family caregivers. The characteristics that define self-efficacy in family caregivers include their sense of assurance, competence, and confidence in their capacity to care for adult family members, friends, or members of the community.[7] Self-efficacy will influence motivation to act, levels of depression, anxiety, and feelings of disappointment experienced by the family.[11,12]

Family caregiver self-efficacy, particularly confidence in managing caregiving demands and self-care, is significantly associated with lower stress levels, emphasizing the need for healthcare practitioners to support family caregivers' self-care to prevent health issues.[12,14] Research results show that effective adaptation skills can help family caregivers survive, avoid mental health disorders, and improve quality of life.[9,15] A self-management program can lessen the burden and improve the self-efficacy of family caregivers.[16,17]

Supportive educational nursing interventions based on Orem's nursing theory can promote better nursing care through education, support, and guidance.[18–20] Supportive education nursing intervention is a simple, affordable, and useful program that can decrease the burden and improve the self-efficacy of family caregivers.[19] There is a lack of formal training and home visitation services in Indonesia that would empower family caregivers to offer patient care at home.[4]To reduce the burden on family caregivers, it is recommended to improve home healthcare quality, provide support and education, and promote patient independence. [21]

The use of supportive education nursing intervention for enhancing the self-efficacy of family caregivers providing care for dependent elderly individuals in Indonesia remains relatively unknown, despite the known obstacles. In summary, we aimed to investigate the effect of supportive educational nursing intervention on family caregivers who care for dependent elderly. It was expected that family caregivers' self-efficacy would rise following the use of supportive educational nursing intervention.

Materials and Methods

Research design

This study was designed as a parallel and two-armed randomized control trial. Before the intervention, the pretest was conducted at baseline, and the post-test was completed five weeks later. This study adheres to the CONSORT guidelines.[22] Eligible participants were allocated (1:1) after completion of the enrollment and baseline measures using simple random (block size of 2,4) assigned to the intervention group or the control group by university IT staff. The university IT staff was not involved in any part of this study and used a computer-generated random sequence to randomize participants.

Setting and samples

The research was conducted in the work area of primary health facilities in Puskesmas Pasar Ikan with 8 sub-districts in Bengkulu. Researchers purposefully chose all participants who met the requirements by reviewing medical record data at the primary health facilities. To reflect on the diversity of the participants, investigators assessed the patient's level of dependency with the Barthel index. The total number of family caregivers living with the elderly who are dependent and need long-term care across the 8 sub-districts in Puskesmas Pasar Ikan in this study is approximately 167. All participants who carried out this study agreed to informed consent.

The sample size was calculated using G*Power 3.1.9.7 software. To compare the means between the two groups with a one-tailed test at a level of significance (α) = 0.05, power of the test (1-β) = 0.80, a large effect size (d) of 0.7, and an allocation ratio N2/N1 = 1.[20] The minimum sample size per group was calculated as 26. A total of

167 potential eligible family caregivers were evaluated, of which 52 eligible family caregivers were randomized until reached 26 participants in each group (Figure 1).

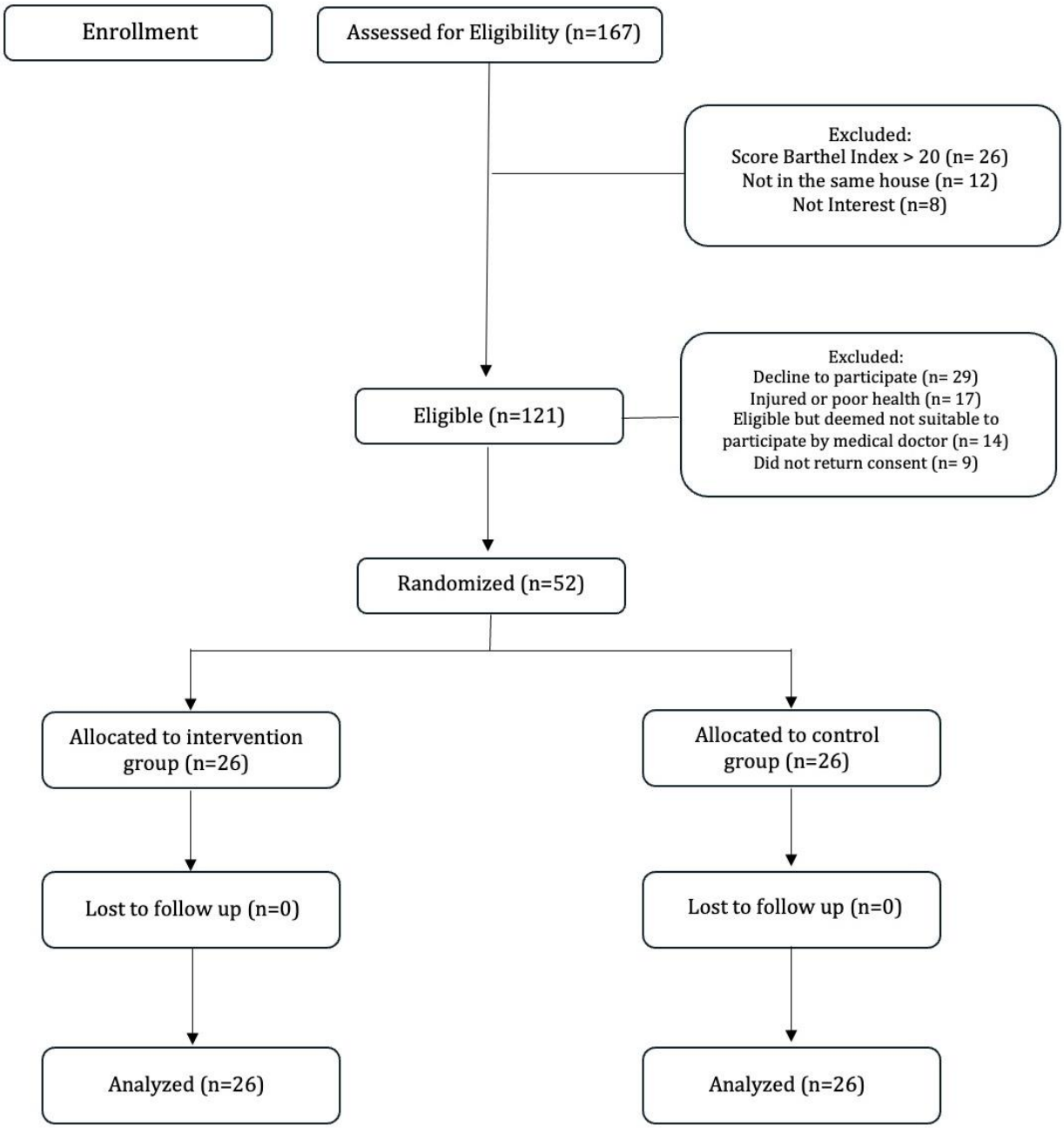

Figure 1. The flow diagram of the study

The following eligible family caregivers included those who were the patient's primary family caregiver and shared a home; were 18 years or older; caring for patients with total dependence based on the Barthel index and willing to spend time for the process of the research. Family caregivers who were already receiving therapeutic intervention to decrease their burden or caring for nursing home-dependent elderly during the recruitment period were excluded. Approaches to potential participants who met the eligibility criteria were carried out to explain the aims, benefits, and procedures of the research. After potential participants signed the consent form, the researcher then conducted a pretest.

Intervention

The researchers developed a supportive educational nursing intervention after reviewing the relevant literature. The supportive educational nursing intervention included audio visual, module book, and worksheet that covered relevant parts of dependent elderly and caregivers' self-efficacy, as well as an overview of how to be a good family caregiver and strategies needed to care for dependent elderly, such as stressors and obstacles to being a family caregiver, the need of topical care, self-care, activity daily living and emergencies of the dependent elderly. Two researchers (TA, NY) conducted all the instructional sessions to guarantee consistency in the implementation of the intervention. Every participant in the intervention group was visited door to door by researchers for 45 minutes as part of supportive educational nursing intervention sessions. The role and self-efficacy of family caregivers are enhanced using audiovisual and educational video-based module books, which facilitate discussions, presentations, and further explanations. The content of educational videos, which are made to meet specific objectives, includes details about the responsibilities, capacities, and self-efficacy of family caregivers in providing care for dependent elderly people as well as the characteristics of such individuals. A worksheet and module were created to pinpoint the work, appropriate, and useful skills for its application to support the researcher's explanation of the instructions.

Measurement and data collection

To investigate the effects of supportive educational nursing interventions on family caregivers, several outcomes were assessed. The study instruments were twofold: (i) a questionnaire for demographic data; and (ii) a self-efficacy questionnaire for family caregivers. The purpose of the demographic information questionnaire was to gather data about participant characteristics, including age, gender, education level, length of caregiving experience, and type of employment. We also created questions about illnesses, such as a specific type of disease.

We evaluated the self-efficacy of family caregivers using the Caregiving Inventory (CGI) developed by Merluzzi, et al. [23] The 21-item Caregiver Inventory is divided into four subscales: managing medical information, caring for the care recipient, taking care of oneself, and handling challenging interactions and emotions associated with tasks performed when taking care of ill family members. The instrument uses a Likert scale, with the number 1 indicating not at all confident in carrying out the treatment, and the value 9 indicating very confident in completing the action. The reliability score of the Caregiver Inventory translated into Bahasa Indonesia was 0.85.[24] We received permission to use the CGI from Merluzzi, et al also the CGI Bahasa version from Rochmawati & Prawitasari.[23,24]

The procedures outlined below were followed in conducting this study. Following official approval from the director of Puskesmas Pasar Ikan and an explanation of the study's objectives to the head nurses, the researchers started gathering data with a preparatory phase in which all family caregivers who were eligible and cared for dependent elderly people during the time frame set were asked to participate in the study and signed a written informed consent form. The patients who fulfilled the inclusion requirements and gave their consent to participate were then divided into two groups: the intervention group and the control group.

The study was conducted over five weeks, two days a week (Wednesday and Saturday) from 8:00 a.m. to 5:00 p.m. at the Puskesmas Pasar Ikan primary health facilities work area. It took a lot of hard work for the researchers to determine the schedule to set for the intervention group. Every Sunday, participants were contacted to schedule weekly meetings in the intervention group. Each session lasts 45 minutes with details of 15 minutes for material sessions and 30 minutes for discussion sessions with family caregivers.

Based on four of Orem's theories, the intervention group got routine home visits and SENI: "teaching" through PowerPoint and audiovisual education, "guiding" through weekly worksheets, "supporting" through weekly phone calls, and "developmental environment" with the provision of a module book. Based on Orem's "teaching" and "guiding" theories, the control group was only given routine home visits. The family caregiver's worksheet must be completed, and it will be updated each time the researcher visits.

In the control group, family caregivers' health problems were addressed in a nursing consultation following the usual home visit of health monitoring dependent elderly in primary care, without considering the factors associated with family caregivers' care that cause burden. During the design and development of the trial, there was no specific protocol in the primary care service for family caregivers.

Following the presentation in the orientation session, the family caregivers were given a written educational program outlining the learning objectives and subject matter for each session. Next, a questionnaire was used to evaluate self-efficacy and the traits of family caregivers. Family caregivers received information about diseases, the significance of providing care for the elderly who are dependent, and how to oversee their self-

care throughout sessions one through four. The SENI program covered a wide range of topics and methods, including worksheets, instructional videos, PowerPoint slideshows, and modules. Table 1 provides a summary of the SENI program's goals and contents.

Table 1. The content of the Supportive Educative Nursing Intervention program

Session	Content	Goals	Methods
Orientation	Introducing the instructors and family caregivers to each other and overview of the program Discussion of the importance of the program both for patients and caregivers and completion of a questionnaire by family caregivers	To introduce family caregivers to the program and establish a rapport of trust between family caregivers and instructors	Question–Answer
Week 1	Emphasis on the importance of caregiver's roles Discussion about how to care-dependent elderly	To identify the role of caregivers To understand the disease and its symptoms	Lecture, question–answer discussion, delivering PowerPoint and audio-visual education
Week 2	Teaching about self-care, managing the patient's symptoms, and referring the patient to an emergency	To recognize the emergencies of dependent elderly	Lecture, question–answer discussion, audio-visual education.
Week 3	Discussion about adaptation to caregiving roles by promoting coping strategies and self-efficacy Orientation toward problem-solving methods and time management in the caregiving situation	To promote family caregivers' self-efficacy To promote the capability of caregiving	Lecture, question–answer consultation, PowerPoint
Week 4	Explanation of the importance of self-care in caregiving and completion of a post-test questionnaire by family caregivers	To maintain and promote caregivers' physical and mental health	Lecture, question–answer, delivering PowerPoint and audio-visual education

Each session included a lecture from the researcher in the first half and a conversation between the researcher and the family caregiver in the second half. The caregivers talked about alternate approaches to their caring roles and related and shared their experiences in caring for dependent elderly.

Data analysis

Using SPSS 24 software, the collected data were arranged, tabulated, and statistically examined (IBM Corp, 2021). Descriptive statistics (Mean ± SD and percentage) were utilized to analyze the demographic data. Using the chi-square and t-test, the homogeneity of the intervention and control groups with considering demographic data was evaluated. In addition, we compared the baseline characteristics of the participants who completed the follow-up assessments (completers) and those who were lost to follow-up (drop-out). The two groups' data were normally distributed according to the Kolmogorov-Smirnov test, so the independent sample t-test was used to compare the data between the groups, and the paired sample t-test was used to compare the data within the groups before and after the intervention. A fixed significance level of $p < 0.05$ was used to interpret the significance test results.

Ethical considerations

The study was approved by the Faculty of Public Health Sriwijaya University with number Institutional Review Board is 288/UN9.FKM/TU.KKE/2023. Following an explanation of the study's goal, each participant gave written consent to take part in the research and was given the assurance that all information collected would be kept completely confidential and used only for that purpose. The researchers stated that participation in this study was completely voluntary and anonymous. It was also explained to participants that declining to take part in the study would not have any negative effects on their health.

Results

Data was available for 52 participants who took part in this study. Their demographic characteristics are described in Table 2. The mean age of participants is 51.44±6.37 years. The homogeneity of variables such as sex, education, employment, patient's medical diagnoses, and income was assessed using a chi-square test, and then age and length of caregiving were assessed using an independent t-test, which divided the different levels of variables into two intervention and control groups. The mean±SD age (years) and length of caregiving (years) were 51.15±7.15 and 3.80±2.48 in the intervention group, respectively, and 51.73±5.62 and 3.42±1.94 in the control group (Table 2).

Table 2. Demographic Characteristics of Family Caregivers

Characteristic		Intervention Group n (%)	Control Group n (%)	X^2/t	p-value
Age (years)	Mean (SD)	51.15 (7.15)	51.73 (5.62)	-0.323[a]	0.187
Length of Caregiving (years)	Mean (SD)	3.80 (2.48)	3.42 (1.94)	0.622[a]	0.234
Sex	Male	20 (76,1)	20 (76.9)	0.332[b]	0.565
	Female	6 (23.1)	6 (23.1)		
Education	Literate	13 (50)	17 (65.4)	0.709[b]	0.400
	Not Literate	13 (50)	9 (34.6)		
Employment	Employee	10 (38.5)	13 (50)	0.312[b]	0.577
	Not employee	16 (61.5)	13 (50)		
Patient's medical diagnose	Stroke	10 (38.5)	11 (42.3)	0.876[b]	0.645
	Diabetes	4 (15.4)	6 (23.1)		
	Osteoporosis	12 (46.2)	9 (34.6)		
Income	< minimum wage	10 (38.5)	13 (50)	0.312[b]	0.577
	≥ minimum wage	16 (61.5)	13 (50)		

[a] Independent t-test [b] Chi-square, minimum wage = IDR 2.494.915

The mean score of family caregiver's self-efficacy was 20.19±17.88 in the intervention group and 94.58±22.38 in the control group before the intervention and changed to 114.23±18.35 in the intervention group and 101.58±22.03 in the control group after the intervention (Table 3). Based on the results of the paired t-test, the mean score of family caregiver self-efficacy had a statistically significant change in the intervention and control group ($p<0.001$). Based on the independent t-test, the mean score of family caregiver's self-efficacy before intervention had no significant difference between the two groups ($p>0.05$). However, after intervention, the mean score of family caregiver self-efficacy had a statistically significant difference between the two groups ($p<0.05$). In addition, the mean increase of 24.04 in the experimental group and a mean increase of 7.00 in the control group showed a significant difference between the two groups ($p<0.001$).

Table 3. The comparison of the mean and standard deviation of the family caregivers' self-efficacy before and after the intervention

Family caregivers' self-efficacy	Pre-Intervention		Post-Intervention			Pre-Post Differences		
	M	SD	M	SD	P-value**	Effect size	M	SD
Intervention Group (n=26)	90.19	17.88	114.23	18.35	<0.001	0.623	-24.04	5.64
Control Group (n=26)	94.58	22.38	101.58	22.03	<0.001		-7.00	4.11
p-value*	0.439		0.029				<0.001	

* Independent t-test
** Paired t-test

Discussion

The results of this study indicate that the intervention using Supportive Education Nursing Intervention (SENI) is significantly different from other interventions and can increase the self-efficacy of the patient's family to reduce the burden on family caregivers. The same results were also shown by previous research regarding the self-efficacy of hemodialysis patients by Wasalamah, et al, that Supportive Education Nursing Intervention (SENI) Orem's theory can increase self-efficacy. Other research explains the significant influence of the application of SENI in increasing the knowledge and attitudes of participants who are breast cancer patients.[20,25]

Some mentioned a variety of interventions such as direct education, showing motivational videos, arm stretching, using booklets, monitoring, and closing with a final evaluation.[25] Apart from that, intervention activities are also mentioned in 3 categories, namely teaching, guiding, and supporting which are carried out in a hybrid manner (online and offline) for participants.[20,26] Different media are mentioned in other studies, specifically the usage of media in the form of animated films and early childhood logbooks with light games.[27]

Orem nursing theory is a comprehensive self-nursing theory that provides the most appropriate clinical guidelines for planning and implementing self-nursing principles. In his philosophy, the main thing in Orem's theory is to prepare individuals to be able to take care of themselves. Self-efficacy is a factor related to self-care behavior.[28] Self-efficacy is the belief a person has in their ability to adopt a behavior and achieve the expected results.[29] The results of this research show that there is a connection between self-efficacy and Orem theory. Supportive Nursing Education Intervention (SENI) based on the Orem theory, can increase caregivers' self-efficacy. Good self-efficacy enables family caregivers to manage caregiving burdens and psychological distress

more effectively, utilize positive coping strategies, reduce depression, and enhance their overall psychological well-being. [13,14,17]

Future research could explore integrating community engagement into Supportive Education Nursing Interventions (SENI) to enhance family caregivers' self-efficacy within Orem's framework. This includes investigating the role of local organizations and community support systems in strengthening caregivers' skills and confidence, as well as examining how regular community meetings and collaborative dialogues can address challenges and refine caregiving practices.[30] Additionally, research could assess the impact of community-driven initiatives on caregivers' quality of life and their ability to manage caregiving demands.

Conclusion

We have shown a positive rise in the self-efficacy of caregiving with the supportive educational nursing intervention that was specifically designed for family caregivers of elderly dependents in Bengkulu. Thus, by taking into consideration and putting this program into practice, healthcare professionals, especially nurses, can play a significant role in assisting family caregivers.

The findings of the current study must be considered within its limitations. Because of their personal and financial circumstances, family caregivers' opinions about providing care may have varied between the interventional and control groups. Researchers attempted to control this issue by random allocation of the family caregivers to the groups. The purpose of using modules as a "developmental environment" tool was for participants to read the module, but researchers were unable to verify that this was the case. Researchers confirmed directly to participants when weekly phone calls and meetings. In addition to providing interventions for respondents in the intervention and control groups, researchers participated in the data collection process. This may cause bias in the study's findings.

Family caregiver burden can arise because of the caregiver's duties and role in providing care to patients. Self-efficacy can be something important to prevent a burden on family caregivers. With self-efficacy, family caregivers can directly reduce psychological distress when dealing with challenges in caring. The SENI nursing care model represents an innovative and evidence-based approach to enhancing family caregivers' self-efficacy while simultaneously mitigating and preventing caregiver burden. By empowering caregivers with the knowledge, skills, and support necessary to navigate the complexities of caregiving, the SENI model addresses both the practical and emotional dimensions of care.

Integrating the SENI program into primary health services holds significant potential to improve health outcomes for both caregivers and care recipients. This integration can be optimized through context-specific adaptations that consider local cultural, social, and healthcare system dynamics. Tailored modifications might

include alignment with local healthcare policies, and incorporation of community resources to enhance accessibility and relevance.

Ethical Considerations: The study was approved by the Faculty of Public Health Sriwijaya University with number Institutional Review Board is 288/UN9.FKM/TU.KKE/2023.

Conflict of Interest: The authors declare no conflict of interest.

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