

# Effectiveness of home care intervention on family ability to do caregiving at home and increase the independence among elderly with dementia

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Hidayatus Sya'diyah<sup>1,2</sup>, Nursalam<sup>3</sup>, Mahmudah<sup>4</sup> and Ferry Efendi<sup>3</sup>

## Abstract

**Background:** Dementia had effect on the dependence status of the elderly. Living in family can increase independence among elderly. The purpose of the study was to determine the effectiveness of home care intervention on the family's ability to conduct caregiving at home as well as the independence of the elderly with dementia. Also, to determine the effect of family ability to conduct caregiving at home on the independence of the elderly with dementia.

**Design and Methods:** This study used quasi-experimental with cross-sectional design. The sample size was 40 respondents into two groups and it was selected using simple random technique. Data were collected from January to June 2021. The intervention group received home care intervention, and the control group did not receive any treatment. The outcome was measured using questionnaire and analyzed using paired t-test and linear regression test.

**Results:** This study showed that home care intervention is effective in improving the family's ability to do home care ( $p$  value  $<0.05$ ) as well as the independence of the elderly with dementia ( $p$  value  $<0.05$ ). In addition, the ability of family to conduct caregiving at home had effect on the independence of the elderly with dementia ( $p$  value  $<0.05$ ).

**Conclusion:** The home care intervention was effective in improving family ability and independence of elderly with dementia. This intervention was developed based on caregiver empowerment. It can be the guideline of family to conduct home care.

## Keywords

Family, elderly, independence, dementia

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## Introduction

Dementia is a degenerative disease that requires long-term care, which is generally experienced by people aged over 60 years.<sup>1,2</sup> Several programs have been carried out as an effort to provide support for the independence of the elderly in Indonesia, but there has been no specific program for the elderly with dementia that involves the role of the family caregiving.<sup>3</sup> The quality of life among elderly can be affected by place of residence. Previous studies have shown that the elderly who live at home can improve the independence, especially for their activity daily living, verbal communication, cognitive, and behavior.<sup>4</sup> The priority of elderly care is in their home environment through home care.<sup>5</sup>

Elderly with dementia had symptoms such as cognitive disorders, inability to communicate, decrease of activity daily living, aggressive behavior, and lead to dependence as well as decrease of quality of life.<sup>6</sup> In addition, the brain function of elderly decreases and has effect on independence.<sup>7</sup> Further,

<sup>1</sup>Doctoral Program, Faculty of Public Health Universitas Airlangga, Surabaya, Indonesia

<sup>2</sup>Stikes Hang Tuah Surabaya, Surabaya, Indonesia

<sup>3</sup>Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

<sup>4</sup>Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia

### Corresponding author:

Mahmudah, Faculty of Public Health, Universitas Airlangga, Kota 60115, Indonesia.

Email: mahmudah@fkm.unair.ac.id



they also had experience neurological deficit and related to the balance,<sup>8</sup> dependence of behavioral, such as urinary incontinence<sup>9</sup> and dependence of activity daily living.<sup>10</sup>

The symptoms can be worse if the elderly was not carried out properly by health services or from their family.<sup>11</sup> The provision of home care services can be carried out by nurses and family members.<sup>12</sup> Elderly who lived with their family can increase their independence.<sup>13</sup> Because family has a key role, especially for conducting home care. However, the phenomenon in Indonesia shows that home care is carried out only by nursing staff from primary health care as well as from hospital,<sup>14</sup> so it is necessary to develop the implementation of home care that was carried out by family members. The previous study is still focused on caregiver burden.<sup>15</sup> Family has five basic functions, namely affective functions, socialization, reproduction, economy, and health care or maintenance. It was expected home care by family members can prevent health problems.<sup>16</sup> The purpose of the study was to determine the effectiveness of home care intervention on the family's ability to conduct caregiving at home as well as the independence of the elderly with dementia. Also, to determine the effect of family ability to conduct caregiving at home on the independence of the elderly with dementia.

## Method

This study was already granted by ethical clearance from Nursing Faculty, Universitas Airlangga, number 2139-KEPK. We selected 40 families who had elderly with dementia using simple random technique, 20 participants in the treatment group and 20 participants in the control group. The minimum total sample size for experimental study based on recommendation was 15 participants in the group.<sup>17,18</sup> This study used a quasi-experimental method with a cross-sectional design. The data was collected from January to June 2021. The inclusion criteria of this study were: families who had elderly with dementia, the elderly suffering dementia less than 5 years, and extended family type. The exclusion criteria of this study were family who take care the elderly with physical or mental illness or disability such as: blindness, deafness, and muteness and the elderly undergoing treatment as inpatient in hospital or primary health care center.

## Intervention module

The home care intervention module was developed from caregiver empowerment theory.<sup>19</sup> This module consists of concept of elderly with dementia, elderly program in health care, family support, family environment, activity daily living of elderly, emotion management, modality therapy for elderly with dementia. The application of module was health education, training, and accompaniment.

Families were treated eight sessions for 8 weeks: two sessions for education, two sessions for training, and 4 sessions for accompaniment for conducting home care for elderly with dementia.

## Clinical measurement

### *Family caregiving at home*

Family caregiving at home was measured using Care Giver Outcomes.<sup>19</sup> It was used to measure the ability of family to take care the elderly with dementia. It has three indicators perceived health, perceived growth, and existential well-being. The questionnaire using Likert scale with range between 25 and 100.

### *Elderly independence*

Elderly independence was measured using Dementia Elderly Self-reliance Card.<sup>11</sup> It has four indicators: verbal communication, activity daily living (ADL), cognitive and aggressive behavior. This questionnaire has 28 items with Likert scale. The ranges score between 32 and 121.

## Analysis the data

Data analysis was used SPSS. Descriptive statistic was used to analyze the characteristic of participants. Chi-square was used to analyze categorical data. Paired T-test was used to analyze pre and post intervention. The regression linier was used to analyze the effect of home care family ability to conduct caregiving at home on the independence of elderly. We used the level of significance 5%.

## Results

### *Participants*

Participants in this study were family's member who take care of elderly with dementia. Table 1 showed the characteristic of respondents. Most of participants were more than 50 years old, female, and house wife in both groups. In addition, in the treatment group most of participants had elementary school education and the income was minimum wage. Further, in the control group, most of participants had bachelor degree and had minimum wage.

### *The effect of home care intervention on the ability of family to conduct caregiving at home*

We measured the ability of family to conduct caregiving by comparing the results before and after interventions in the treatment group and the control group. Table 2 showed

**Table 1.** Characteristic of respondents.

Characteristic	Treatment		Control		Chi square
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)	
Age (years)					
<35	2	10.0	5	25.0	0.758
36-40	0	0.0	3	15.0	
41-45	2	10.0	2	10.0	
46-50	1	5.0	0	0.0	
>50	15	75.0	10	50.0	
Gender					
Male	5	25.0	7	35.0	1.000
Female	15	75.0	13	65.0	
Occupational					
Farmer	0	0.0	1	5.0	1.000
Self-employee	4	20.0	7	35.0	
Civil servant	1	5.0	2	10.0	
House wife	15	75.0	10	50.0	
Education					
Not finished school	2	10.0	1	5.0	0.560
Elementary school	9	45.0	1	5.0	
Junior high school	2	10.0	3	15.0	
Senior high school	5	25.0	4	20.0	
Bachelor degree	2	10.0	11	55.0	
Income					
<Minimum wage	15	75.0	8	40.0	0.924
Minimum wage	3	15.0	7	35.0	
>Minimum wage	2	10.0	5	25.0	

**Table 2.** Outcome analysis of home care intervention on the ability of family to conduct caregiving at home (n = 40).

Group	Indicator of family ability		$\bar{x}$	SD	$\Delta$	t	p
Treatment	Perceived health	Pre	57.30	6.594	18.25	8.395	0.000*
		Post	75.55	6.501			
	Perceived growth	Pre	59.80	7.113	17.1	8.967	
		Post	76.90	6.164			
	Existential Well Being	Pre	51.40	9.389	22.25	10.913	0.000*
		Post	73.65	6.055			
Control	Perceived health	Pre	60.35	7.909	-1.40	1.127	0.274
		Post	58.95	9.784			
	Perceived growth	Pre	60.30	9.625	-0.30	1.101	0.285
		Post	60.00	9.503			
	Existential Well Being	Pre	58.85	7.492	-1.90	1.554	0.137
		Post	56.95	8.781			

the results of the family's ability to conduct home care before and after the intervention. The average score in the treatment group increased for each indicator with a  $p$ -value  $\leq 0.05$ . It was indicated that there were differences in the ability of family to conduct caregiving at home before and after intervention. The average score of family ability to conduct caregiving in the control group showed decrease between pre and posttest with  $p$ -value  $\geq 0.05$ . It was indicated that there was no difference before and after the intervention in the control group.

### *The effect of home care interventions on the independence of the elderly with dementia*

Table 3 showed the results of the independence of elderly with dementia before and after the intervention in the treatment and control group. The average score in the treatment group has increased, including indicators of verbal communication, activity daily living (ADL), cognitive and behavior, with  $p$  value  $\leq 0.05$ , it was indicated that there were differences in the independence of the elderly with

**Table 3.** Outcome analysis home care intervention on the independence of the elderly with dementia before and after intervention ( $n=40$ ).

Group	Variable		$\bar{x}$	SD	$\Delta$	t	p
Treatment	Verbal communication	Pre	62.55	8.463	9.25	3.547	0.002*
		Post	71.80	10.446			
	ADL	Pre	58.50	9.660	11.6	3.478	0.003*
		Post	70.10	12.490			
	Cognitive	Pre	60.95	9.389	11.3	3.937	0.001*
		Post	72.25	6.055			
	Aggressive behavior	Pre	59.95	9.439	11.3	4.961	0.000*
		Post	71.25	9.172			
Control	Verbal communication	Pre	57.00	5.629	-1.55	0.742	0.467
		Post	55.45	10.380			
	ADL	Pre	57.00	6.775	1.60	1.324	0.201
		Post	58.60	7.989			
	Cognitive	Pre	58.25	7.040	0.95	0.802	0.432
		Post	57.30	8.317			
	Aggressive behavior	Pre	59.55	7.112	0.20	0.124	0.903
		Post	59.75	9.803			

**Table 4.** The influence of the family ability to do home care on the independence of the elderly dementia ( $n=40$ ).

Variable	Coefisien	T Statistics	p
Family ability to conduct caregiving at home	0.566	4.203	0.000

dementia before and after intervention on each indicator. While the average score of the independence of the elderly with dementia in the control group showed decrease with  $p$ -value  $\geq 0.05$ . It was indicated that there was no difference before and after the intervention in the control group.

### *The effect of family ability to conduct caregiving at home on the independence among elderly with dementia*

Table 4 showed t value of the effect of family ability to conduct caregiving at home on the independence among elderly with dementia was  $4.203 \geq 1.96$  and  $p$ -value  $\leq 0.05$ . It was indicated that there was an effect of family ability to conduct caregiving at home on the independence of the elderly with dementia.

## **Discussion**

### *The effect of home care intervention on the ability of family to conduct caregiving at home*

The family ability to conduct caregiving at home consist of three indicators such as perceived health, perceived growth, and existential well-being. After home care intervention, the score of these indicators were increase, and the existential well-being had the highest score. This

intervention focused on the training for family to provide caregiving at home. Previous study mentioned that home care is also strengthened by caregiver empowerment<sup>20</sup> as well as family as internal caregivers.<sup>21,22</sup>

Home care interventions are given to families through three stages of activity, the education stage, the training stage and the mentoring stage. The first stage is education stage. The education stage gives the information for family to conduct caregiving at home for elderly with dementia, this stage developed three domains of learning, that was cognitive, affective, and psychomotor aspects.<sup>23,24</sup> It was expected family had ability to conduct caregiving at home for elderly with dementia. After intervention, family knew how to conduct caregiving at home for elderly, especially their perceived health, perceived growth, and existential wellbeing.

Family has the ability to conduct caregiving at home for elderly with dementia, especially for existential wellbeing experienced. Family was needed to support the health insurance, transportation, information, recreational therapy, social activities to maintained the cognitive elderly with dementia.<sup>25,26</sup>

### *The effect of home care interventions on the independence of elderly with dementia*

This study showed that there was an effect of home care interventions on the independence of the elderly with dementia. The independence of the elderly with dementia had four indicators: verbal communication, activity daily living (ADL), cognitive and behavioral indicators. The score of ADL was the highest. Activity Daily Living (ADL) for the elderly was term to describe basic skill to selfcare, such as eating, bathing, and mobility.<sup>27</sup> In this

study, family motivated the elderly to take care their selves independently, such bathing, toileting, dressing, and mobilizing.

Elderly with dementia showed several disorders, such as cognitive and memory disorders so they can not to conduct their activities independently.<sup>28</sup> It needs treatment to maintain their cognitive. Home care intervention, especially cognitive stimulation such as physical activity was expected to stimulate their brain function.<sup>29</sup> In this study, we involved the elderly in several activities such as reading, social interaction, and spiritual activity.

### *The effect of family ability to conduct caregiving on independence among elderly with dementia*

The ability of family to conduct home care had effect on the independence among elderly with dementia. Health care delivery models showed that family that was involved in health care can reduce health costs and had many benefits.<sup>30,31</sup> Family provides support system including emotional support, instrumental support, and assist the elderly to fulfill activity daily living (ADL) such as eating and bathing, transportation.

### Conclusion

This study showed that home care intervention is effective in improving the family's ability to do home care as well as the independence of the elderly with dementia. In addition, the ability of family to conduct caregiving at home had effect on the independence of the elderly with dementia. The module intervention was developed based on caregiver empowerment. It can be the guideline of family to conduct home care.

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### Contributions

The authors contributed equally

### Declaration of conflicting interests

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### Significance for public health

Dementia is a degenerative disease that requires long-term care among elderly. Several programs have been carried out as an effort to provide support for the independence of the elderly, especially involving family to do home care at home. Family is needed to support elderly with dementia. Family can promote health among elderly with dementia.

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