IMPLEMENTATION EFFECTIVENESS OF COMMUNICATION, INFORMATION AND EDUCATION INTERVENTION ON ELDERLY PEOPLE NUTRITION KNOWLEDGE AND ATTITUDE

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ABSTRACT

The increasing composition of population number needs to be addressed particularly in relation to the quality of the elderly welfare to maintain productivity and independence. This study aimed to create a model of health promotion intervention on nutrition knowledge and attitude of the elderly by using Communication, Information and Education (CIE) approach to improve nutrition knowledge and attitude of elderly people and to examine intervention effectiveness. This study uses *pre-test and post-test* method to examine the intervention impact. Random sample was 90 elderlies from two Public Health Centers (Puskesmas) and Integrated Community Development Post (Posbindu) in Kota Tangerang Selatan. The research result showed that CIE intervention implementation has improved nutrition knowledge and attitude of the elderly people., The intervention impact is still affected by the previous nutrition knowledge. In general, implementation of CIE intervention to the elderly people has averagely increased nutrition knowledge by 13%, and nutrition attitude by increase by 8.6%.
Keywords : elderly people nutrition knowledge and attitude, CIE intervention.

INTRODUCTION

Coordinating Ministry for People's Welfare (2010) published a report that Indonesia is reaching the era of aging population. In 2000 the number of people above the age of 60 was 7.18%. In 2010, the life expectancy in Indonesia was 67.4 years with the number of the elderly population reaching 23.9 millions (9.77%) and is predicted to become more than 28 millions in 2020. In 2050 the number of the elderly people is predicted to be 71.6 millions.

The life expectancy of active and productive elderly population is expected not to be a demographic burden for any country especially Indonesia. The increasing number of elderly population is on one hand a potency if the independency and well-being aspects were maintained. People's welfare can be judged by the degree of health. Therefore the increasing number of elderly people has to be managed especially in relation to the life quality of the elderly population to remain productive and independent.

Naturally, the elderly population will experience body organs function degeneration that put their health at risks. Health factor is strongly related to nutrition issues, among them are the increasing number of degenerative and non-degenerative disease that causes changes of food intake, absorption, and nutrients utilization on tissues level as well as certain medicines consumption caused by suffered illnesses (Muis 2006).

Health factor and food intake on the elderly are correlated, thus nutrition status has become one of the indicators of the elderly population welfare. Researches on elderly population nutrition have been conducted by researchers in many places. Puspitasari (2011) stated that elderly nutrition is positively correlated with the sufficiency level of energy, protein, calcium and phosphor. Rusilanti and Kusharto (2006) stated that the psychosocial aspects and physical activities have positive correlation with the nutrition level of the elderly as a whole.

The researches on the elderly nutrition on Posbindu and Non-Posbindu members in Kota Tangerang Selatan have been conducted by observing the map of the effects of determinant factors on the elderly nutrition status (Fadila, 2013). The empirical result of this research showed that the nutrition status of the elderly in Posbindu has yet to show good food consumption and behavior. Nutrition behavior of theelderly and food consumption of Posbindu members in average is still under the category of adequate so it has no impact toward the nutrition status.

Quality of elderly population nutrition behavior and food consumption have to be improved because of its direct relation to the nutrition status of the elderly population. To put into action, the results of the research have to be followed up by applying interventions through communication, information and education activities to promote health especially on nutrition for healthier and independent elderly population.

Health influencing factors are environmental, hereditary, health services and lifestyle (Blum, 1974). A conceptual frame can be derived from Blum's theory that connects health service factor (one ofthe form is health promotion/promotive) to nutrition behavior of the elderly members of Posbindu.

Basically, human behavior is all human activities that can be directly observed or can not be observed by others (Notoatmodjo, 2003). Nutrition behavior is one of the factors of health behavior. Behaviors being observed further are knowledge, attitude, and nutrition-related activities. Health promotion is being implemented by the Communication, Information and Education (CIE) approach. The effect of CIE approach on nutrition knowledge change of elderly Posbindu meRmbers is the focus of this research.

Kota Tangerang Selatan was chosen particularly because as one of the youngest cities in Indonesia, Kota Tangerang Selatan is 12th most populous cities in Indonesia with 1.290.322 population. Kota Tangerang Selatan lies on the east part of Banten Province(Kota Tangerang Selatan Office of Statistics, 2010). Banten Province has 7.21% elderly population or 760,876 from the total population of 10,632,166. One of the rapid increases in elderly population in Banten Province happened in Kota Tangerang Selatan.

This research aims to achieve empirical description on the effect of health promotion by CIE approach on elderly population nutrition knowledge change. The research problem is to create a health promotion intervention model with CIE approach to improve nutrition knowledge and measure its effectiveness. The result of this research is expected to convey information on the effect of health promotion with CIE method on elderly members of Posbindu to achieve health improvement among the elderly.

METHODOLOGY

Pretest-postest intervention method is being used to measure the extent of CIE intervention affecting nutrition behavioral change. In general, the research framework concept can be illustrated with Image 1.
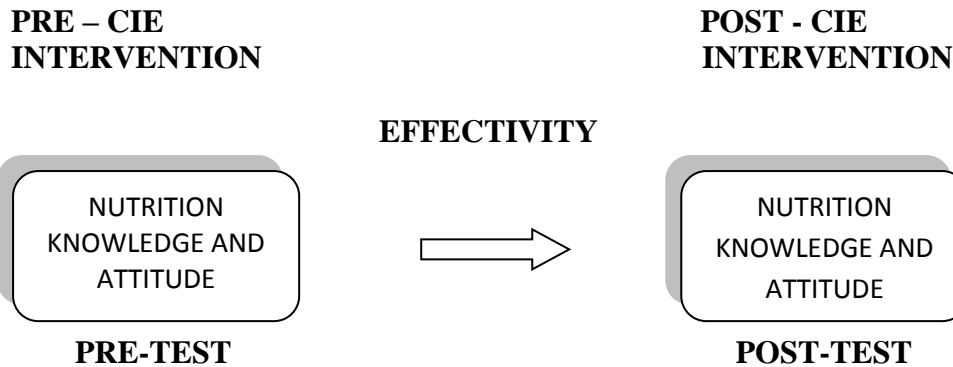
PRE – CIE INTERVENTION   **POST - CIE INTERVENTION**

EFFECTIVITY

| NUTRITION KNOWLEDGE AND ATTITUDE | ⟶ | NUTRITION KNOWLEDGE AND ATTITUDE |

PRE-TEST   **POST-TEST**

Image 1. Conceptual Frame of CIE Effecton Elderly Nutrition Knowledge and Attitude

This research is a cross-sectional research by observing Posbindu members aged 40-90 in Kota Tangerang Selatan sub-districts. The sub-districts and Posbindu samples were chosen as purposive sample, while the elderly sample in Posbindu was randomly selected based on several criteria: Sub-district sample, Puskesmas, and Posbindu samples were selected based on purposive sampling while elderly samples in Posbindu are randomly selected with the criteria of non-dementia, no hearing problems and the willingness to be interviewed. The elderlies' background variables that are also researched are age, sex, education level, occupation, marital status, income and housing. The main variable in this research is the nutrition knowledge of the respondents prior to and post-KIE intervention implementation. Data was collected using questionnaires that have been developed from several indicators and strengthened by observation and interview.

Nutrition CIE is a way to deliver nutrition-related information or messages from an individual or institution to the society through certain media. In order to achieve successful CIE, several steps are required: planning, implementation and evaluation (FAO, 1994). The implementation of CIE begins with CIE material preparation, followed by material delivery through face to face presentation, and Focused Group Discussion (FGD) between Posbindu members. Questionnaires were filled before and after CIE material delivery, for later analysis.

RESULT AND DATA ANALYSIS

The research has been conducted to 90 elderlies in Sub-districts Pamulang and Ciputat Timur, in Kota Tangerang Selatan. Each sub-district is represented by two Posbindus. General profile of the elderly characteristic can be viewed on Table 1. The number of elderly respondents is dominated by females (91.2%) or 82 people. The average age of the respondents is 61.6 years, variety with deviation standard of 9.5 yeard on the age range between 45 yro. to 84 yro. Average respondents weight and height is 59.7kg and 156.7 cm, each with deviation standard of 12.3 kg (in the range of 40-82kg) and 6.2 cm (in the range of 145-175cm).

Respondents education, approximately 33.3% are elementary school graduates, 51.1% are middle school (junior and senior high school) graduates, and 15.6% are college graduates. Respondents with higher educational background generally live in residential-complex, while those with middle-lower educational background live outside the residential-complex. This showed that Posbindu services have been utilized properly by people with multiple background.All of the respondents are married, 66.7% are still living together with their spouses, and 33.3% are widowed/divorced. Respondents' occupations are dominated by

labors, etc. (70%), retired Public Servants (PNS)/private employees (21.1 %), and private employees (8.9 %).

Table 1. Characteristic Profile of
Elderly Posbindu Members in Kota Tangerang Selatan

No.	Characteristic	Scale	Statistic*			
			Min	*Max*	*Mean*	*St.dev*
1	Age	Year	45	84	61.6	9.5
2	Weight	Kilogram	40	82	59.7	12.3
3	Height	Centimeter	145	175	156.7	6.2
			Frequency			*%*
4	Sex	Male	8			8.9
		Female	82			91.1
5	Education	Elementary School	30			33.3
		Middle School	46			51.1
		College	14			15.6
6	Marital Status	Married	60			66.7
		Widower	30			33.3
7	Occupation	Private employee	8			8.9
		Retired Public Servants/employee	19			21.1
		Laborers, others	63			70.0
8	Income	Low (< Rp 2 millions)	19			21.1
	Per month	Middle (Rp 2 millions- Rp 4 millions)	50			55.6
		High (> Rp 4 millions)	21			23.3
9	Income source	Single	27			30.0
		Family	48			53.3
		Others	15			16.7
10	Living	Together	70			77.8
		Alone	20			22.2

Note : *) Number of respondents, *N* = 90 people.

The monthly income rate of respondents are varied, although it is predominantly middle-income (Rp. 2 millions – Rp. 4 millions) with 55.6% of the respondents, higher income respondents (above Rp 4 millions) are 23.3% and the rest 21.1% with lower income (below Rp 2 millions). As well as educational background, the majority of respondents with lower income live outside the residential complex. Main income source are in general from families (children or grandchildren) with as many as 53.3 %, self/spouse (30%), the rest 16.7% are from others (benefits, neighbors, relatives and others). While on living condition, most respondents (77.8%) live with family, and 22% live alone.

In general, respondents characteristic data showed that respondents are dominated by female participants, educational background is mainly middle school (junior and senior high school), married and mostly stillhave spouses, are mostly unemployed or self-employed with middle income, income source are generally from family (the children), and the majority are living with family.

Description of CIE intervention results on nutrition konowledgefrom Pre-test and Post-test are presented on Table 2 and Table 3. The data on the tables shows frequency distribution of elderly population number based on the points of nutrition knowledge aspects arranged in a structured questionnaire.

1. Nutrition Knowledge

Table 2 shows the distribution of the correct answers to each question about nutrition knowledge

Table 2. Number of elderlies after and before CIE outreach on nutrition knowledge

No.	Knowledge Nutrition	After		Before	
		Freq.	%	Freq.	%
1	Vegetables and fruits	89	98.9	88	97.8
2	Chicken meat processing	88	97.8	85	94.4
3	Good food	86	95.6	84	93.3
4	Food amount	84	93.3	79	87.8
5	Coffee or tea consumption	70	77.8	59	65.6
6	Food absorption	66	73.3	45	50.0
7	Healthy food	62	68.9	23	25.6
	Average	**77.9**	**86.5**	**66.1**	**73.5**

The components of nutrition knowledge are divided into seven aspects as mentioned on Table 2. Before intervention, the precentage of nutrition knowledge on the aspects of vegetables and fruit (97.8), chicken meat processing (94.4), good food, (93.3), food amount (87.8), coffee/tea consumption (65.6), food absorption (50.0), and the concept of healthy food (25.6).After nutrition outreach with CIE method, the percentage of elderlieswith correct nutrition knowledge on each of the seven indicators were: vegetables and fruit (98.9), chicken meat processing (97.8), good food (95.6), food amount (93.3), coffee and tea consumption (77.8), food absorption (73.3), and healthy food (68.9). Most of the elderlies (90% or more) had already have the correct understanding on nutrition on three aspects: vegetables/fruits, chicken meat processing and good food. After CIE intervention, beside the three aspects mentioned, most elderlies had have the correct knowledge on nutrition on the amount of food aspect. While there is relatively big number of the elderlies who have not yet accurately understood the nutrition knowledge on three aspects as followed: coffee and tea consumption, food absorption and healthy food concept. After CIE intervention, the three aspects can be understood by approximately 70% of the elderlies.

Generally pretest results prior to the intervention showed that 73.5% of the respondents have correctly answered the questions on every aspect of nutrition knowledge, or in another words every aspect has been understood by 73.5 % of the elderlies. After CIE outreach, the number has increased by 86.5% elderlies per nutrition knowledge aspect. This level of nutrition knowledge is relatively good. The improvement on nutrition knowledge resulted by the implementation of CIE intervention can be clearly seen on four aspects: healthy food (increased from 25.6% to 68.9%), food absorption (improved from 50% to 73.3%), coffee and tea consumption (increased from 65.6% to 77.8%), and food amount aspect (increased from 87.8% to 93.3%). The highest improvement achieved was as many as 40% on the question on healthy food definition. The next significant improvement by 20% was on the food absorption question.

2. Nutrition Attitude

As well as nutrition knowledge, nutrition attitude has also been measured on pretest and post-test. Table 3 shows the pretest and post-test result on respondents' nutrition attitude distribution. Nutrition attitude is measured by 10 aspects.

Table 3. Number of elderlies after and before CIE outreach on nutrition behavior

No.	Nutrition attitude	After		Before	
		Freq.	*%*	*Freq.*	*%*
1	Healthy food and the price	84	93.3	70	77.8
2	Fruits and stomachache	86	95.6	78	86.7
3	Fried food, coffee and breakfast consumption	74	82.2	61	67.8
4	The elderly, food amount and meal frequency	85	94.4	79	87.8
5	The elderly and daily food items	90	100.0	81	90.0
6	Everyday vegetables items	89	98.9	84	93.3
7	Eat and drink regularity	78	86.7	65	72.2
8	Food appearance and appetite	86	95.6	78	86.7
9	Food and health condition	87	96.7	80	88.9
10	Vegetables condition before cooking	83	92.2	75	83.3
	Average	**84.2**	**93.6**	**75.1**	**83.4**

The result showed that in average the respondents answered all the questions in pre-test correctly by 83.4%, after CIE nutrition outreach it increased to 93.6%. After CIE implementation, most of the elderlieshave the correct behavior towards nutrition attitude aspects, except on eat and drink regularity/habit (86.7%) and on fried food, coffee and breakfast consumption (82.2%). Nevertheless, both aspects have improved by 15% than before the intervention. This phenomenon revealed that respondents attitude towards question number 3 and 7 before CIE outreach have yet to be fixed due to their eating/drinking and breakfast habit.

Before CIE intervention, most of the elderly having the correct behavior towards nutrition attitude only on the aspects of daily vegetables intake (93.3%), the elderly and daily meal (90%), and the aspects of food and health condition (88.9%). While for other aspects, many of the elderlies not yet have the correct attitude. The increase in correct answers commonly happen in every aspects of nutrition behavior, starting from an increase of 5% to 15% from the respondents condition prior to the intervention.

In average, the pretest result for respondents nutrition attitude (83.4 %) is higher than the respondents average nutrition knowledge (73.5 %). The same is also for the average post-test results of respondents nutrition attitude (93.6 %) is higher than the respondents average nutrition knowledge (86.5 %). The results shows empirically that the increasing knowledge cause an increasingly better respondents nutrition attitude. This corresponds to the statement of Notoatmodjo (2003), that an attitude as an assessment to an object will be in line with the possessed knowledge . Thus the respondents attitude toward elderly nutrition is in line with the knowledge on elderly nutrition gained.

4. CIE Activities

In general the results of data description analysis above shows that the elderlies nutrition knowledge and attitude, in increasing post nutrition CIE intervention

implementation. Elderly nutrition knowledge and attitude increased significantly (the increase number of elderlies answering correctly are by 5% or more) on four of the seven nutrition knowledge aspects (Table 2), on all (10) aspects of attitude (Table 3), The description is gained based on the analysis results of elderly profiles in each nutrition knowledge and attitude aspects, before and after nutrition CIE intervention. The next analysis is how the level of nutrition knowledge and attitude,before and after nutrition CIE intervention implementation to each elderly. The analysis uses four variables of nutrition, which are the variables of nutrition value knowledge, and nutrition attitude, each in before and after intervention. All variable values of the nutrition knowledge and attitude component have a scale between 0 to 10 (the maximum value to gain). The statistical description on the variable values of the elderly nutrition knowledge and attitude, are presented in Table 4, while the distribution and data pattern are presented in box plot in Image 2.

Table 4. Description Value Statistics of Elderly Nutrition Knowledge and Attitude Before and After Implementation of Nutrition CIE Intervention

No.	Variable	Mean	Std. Dev.	Median	Mini-mum	Maxi-mum	Range	Inter-quartile Range	Skew-ness	Kur-tosis
1	Knowledge_1	7.3	1.52	7.1	4.3	10.0	5.7	2.9	0.047	-0.725
2	Knowledge_2	8.7	1.26	8.6	4.3	10.0	5.7	1.4	-0.821	0.656
3	Attitude_1	6.5	1.64	7.0	1.0	8.0	7.0	2.0	-1.513	2.593
4	Attitude_2	7.4	1.17	8.0	1.0	8.0	7.0	1.0	-2.848	10.87

Notes:
Knowledge_1, andAttitude_1: Value before CIE intervention
Knowledge_2, and Attitude_2: Value after CIE intervention

Results show that the nutrition knowledge and attitude experiencing increase in average value after CIE intervention. Nutrition knowledge increased from the 7.3 average to 8.7, and nutrition attitude increased from the average 6.5 to 7.4. The deviation standard of nutrition knowledge is different from nutrition attitude before and after CIE intervention. This shows that nutrition knowledge and attitude are varied, both before and after CIE intervention.

Image 2 shows that the median and data distribution of nutritional knowledge and attitude value is increasing after CIE nutrition intervention. Distribution of nutrition knowledge and attitude value decrease post CIE intervention, this shows that nutrition knowledge and attitude after CIE intervention became more uniformed compared to before CIE intervention (which is still highly varied).

The circles and stars accompanied by numeric labels in the image shows nutrition behavior data outliers on a number of certain respondents with values far below the data median. After intervention, nutrition knowledge has 4 data below the median reach. After intervention, generally the elderly nutrition knowledge increases post-intervention, but this did not happen to at least these four elderlies (number 1, 5, 7, and 46).

In the nutrition attitude , before CIE intervention, three elderlies have very low values (including elderly number 7, the two others are number 70 and 82). After intervention, there are at least 5 elderlies who are not or less significantly experiencing an increase of attitude (one of them is number 7), while other participants experience attitude improvement.
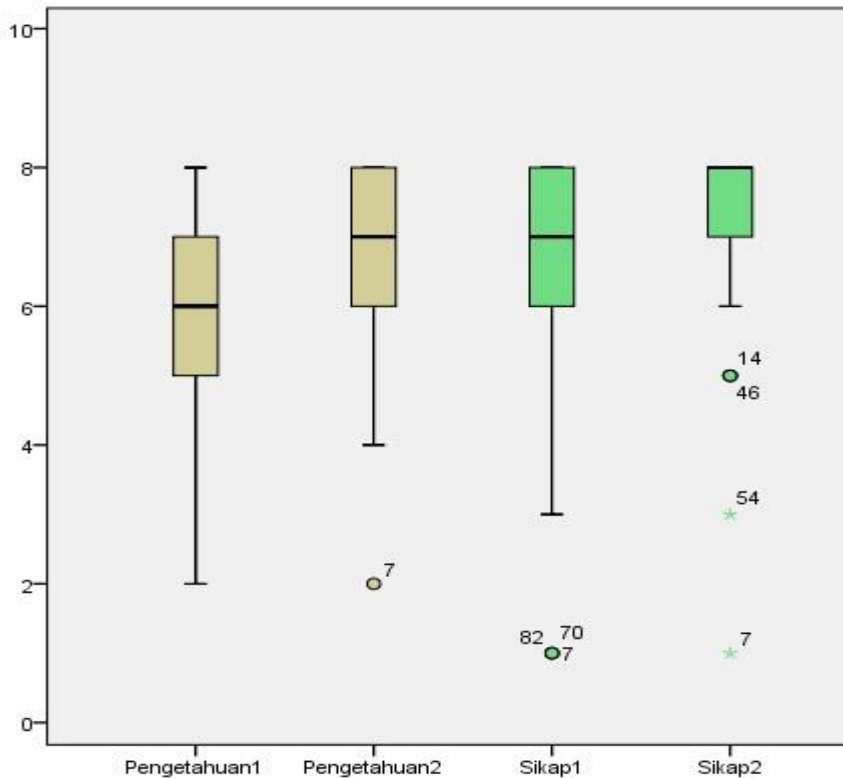
Image 2. Diagram of Nutrition Knowledge and Attitude Component Value Median and Distribution Before and After Nutrition CIE Intervention

Statistically, the description on impact of nutrition knowledge, and attitude improved after CIE implementation can be observed on Table 5. The improvement of nutrition knowledge, and attitude components in average each is 1.30, and 0.86, in the scale of 10. In other words this shows that post intervention, the level of elderly nutrition knowledge value has increased in average by 13%, and nutrition attitude increase by 8.6%.

Table 5. Statistical Description of Elderly Nutrition Knowledge and Attitude Increase

No.	Variable	Mean	Std. Deviation	Median	Skewness	Kurtosis
1	Knowledge	1.30	1.75	1.43	0.098	-0.589
2	Attitude	0.86	1.65	0.00	1.213	2.092

The increase significance between the previous and post CIE implementation results is presented in Table 6. This test is applied using t-student test to see the significance of intervention impact. The statistical values of t test on nutrition knowledge and attitude increase are big enough to reject the hypothesis that there aren't any impact (value -p< 5%). Thus the results of this research indicate that elderly nutrition CIE intervention can increase and improve nutrition knowledge and attitude

Table 6. Ttest Results of Elderly Nutrition Knowledge and Attitude Change Before and After Nutrition CIE Intervention

Nutrition Behavior Component	Mean	Std. Deviation	Std. Error Mean	t	Sig. (p-value)	Paired Correlations	
						Coef.	Sig.
Knowledge	1.30	1.75	0.1843	7.063	0.000	0.219	0.038
Attitude	0.86	1.65	0.1742	4.911	0.000	0.342	0.001

Notes: N=90, df = 89.

Apart of describing the t-student statistics, Table 6 also present the correlation coefficient estimation of each nutrition knowledge and attitude between pre and post intervention. The correlation prior and after intervention for the component of nutrition knowledge and attitude is significant. The correlation of nutrition knowledge before and after intervention is 0.219, which means the condition of nutrition knowledge impacted by intervention increased by approximately 4.8% from the previous level of nutrition knowledge.

Meanwhile, nutrition attitude is correlated by 0.342 to the previous attitude, which means 11.7% of the previous attitude is impacted. Therefore, the results of CIE implementation give a more dominant impact to nutrition knowledge compared to nutrition attitude because aside of the increase for nutrition knowledge is higher than the attitude, also because the impact of the previous condition for the nutrition knowledge is lower than to nutrition attitude.

CONCLUSION

The elderly nutrition knowledge and attitude increase using CIE (Communication, Information and Education) intervention is working effectively. This can be proven through its impact on the improvement of elderly nutrition knowledge, and attitude along with the effectiveness of Integrated Community Development Post (Posbindu) in Kota Tangerang Selatan area.

Prior to CIE intervention, Posbindu member respondents is dominated by married women whose spouse are still alive, the majority are graduates of middle school, with middle income category, having a relatively good level of nutrition knowledge and attitude. After CIE intervention, the level of nutrition knowledge, and attitude experienced a dominant increase in the level of nutrition knowledge (13%) and later on the nutrition attitude(8.6%). The impact of this intervention is still influenced by the prior level of nutrition knowledge and attitude.

RECOMMENDATION

A more intensive intervention is necessary to increase elderly nutrition behavior through the empowerment of pre-existing community groups (posbindu and other communities) with CIE methods. Also, the development/modification of appropriate intervention model is necessary to reduce the influence of pre-intervention nutrition behavior. The results of research is hoped to be useful for all stakeholders of elderly welfare improvement, especially in the aspect of nutrition behavior so Posbindu can function more than implementing curative activities but also as a medium for health promotive and preventive activities.

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