



THE EFFECT OF THE FAMILY CENTERED NURSING MODEL ON THE LEVEL OF FAMILY INDEPENDENCE IN PREVENTING ACUTE RESPIRATORY INFECTIONS (ARI) AMONG CHILDREN IN GUO, WORK AREA HEALTH PUBLIC CENTER OF BELIMBING PADANG

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ABSTRACT

The research aims to analyze the influence of the Family Centered Nursing Model in preventing ARI among children under five on the level of family independence. The research process was started from October 2019 to November 2020 which used a quasi experiment design with a non equivalent control group approach, pre and post-test design. The population is parents of the children in Guo, Work Area Health Public Center of Belimbing Padang, which has 40 samples consist of cases and controls. The sampling technique was purposive sampling. The research instruments were questionnaires and observation sheets, while data processed by editing, coding, entry and cleaning. The results used statistical tests with the Mann-Whitney test p value = 0.023 ($p < 0.05$). This means there is a significant difference between independence after treatment in the case group and the control group. It is necessary to optimize the family's ability to be independent in actively seeking information on children's health by using daily used media. Father's participation is very important in increasing family independence based family centered nursing because it is related to his role in making decision and protecting children against the risk of ARI disease.

Keywords: Family Centered Nursing Model, Family Independence, ARI

INTRODUCTION

World Health Organization [1] data shows the number of children deaths due to pneumonia in the world is 5.9 million. Indonesia is the ninth out of 15 countries in the world that contributes the most under-five deaths due to pneumonia with a child mortality rate of 32 per 1000 live births, this shows that 2-3 children die every hour due to pneumonia. Health workers have used various treatment efforts for patients with Acute Respiratory Infections or ARI (pneumonia). The government has not implemented target yet for eradicating pneumonia in a comprehensive, integrated,

and sustainable manner. Controlling ARI is not only about curative prevention, but also it needs active prevention efforts to reduce the possibility that can increase the potential for ARI incidence [2].

In 2017, the number of pneumonia patients found and treated was 30% in West Sumatra and this has increased compared to 2015 which was only 25% [3]. Data from *Riskesdas* (Basic Health Research) in 2018 showed that in West Sumatra the prevalence of ARI was 5%, while the prevalence of pneumonia rose to 2.5% in 2013 from the percentage of 1%. In 2014, the pneumonia of children ranged from 17.35% - 35.55%,



and it is still far from the national target of 80%. In 2016, the incidence of pneumonia was 3,022 (94.26%) in Padang City [4]. Padang Health Office (2018) showed that there were 81,736 children in Padang in 2017 with the estimated pneumonia sufferers were as many as 3,196 children with a percentage of 3.91%, while 2,719 (85.08%) people are found and treated in Padang. ARI disease is the first rank case out of the ten most diseases (53%) found in Belimbing Public Health Center. This public health center also gets the second rank (48,7%) of public health center in Padang City that has handled ARI disease most [24].

The results of interviews with public health center found that the high of non-repeat visit by the possibility of patients who had been diagnosed with pneumonia. Based on the analysis of family independence data (data from Belimbing Public Health Center), the results of the use of Wilcoxon Signed Rank Test in the treatment group showed that there were differences in the level of family independence in preventing ARI / pneumonia before and after the intervention with p value of <0.001.

Sulistyaningsih, et al (2019) said that in reducing child mortality in Indonesia, it is needed to control pneumonia by promoting exclusive breastfeeding, conducting preventive zinc supplementation, giving full basic immunization, integrated management of sick toddlers (MTBS) and surveillance of pneumonia case finding [5]. Sidiq's research (2018) showed that knowledge value of cadres before and after the intervention was 27.17:29.00 with a p-value of 0.003 (<0.05) [6]. This was not much different compared to the research of Dary, et al (2018) that the incidence of ARI among toddlers or children is quite high in the target area of the Getasan Public Health

Center [7].

The implementation of the ARI disease control program (P2 ARI) requires support from all parties and the active role of the community, especially the family role. This is in line with the current program from the Ministry of Health, such as establishing an operational strategy for health development through the Healthy Indonesian Program with a Family Approach (PIS-PK) [8]. One of the efforts that can be used to increase the role and awareness of families in preventing ARI disease is by empowering families [9]. Family empowerment is a process or effort in growing the knowledge, awareness and willingness of families to maintain and improve health status [10].

Family empowerment is expected to foster family independence in the form of increasing family knowledge, understanding, and behavior in an effort to prevent ARI (pneumonia) among children [11]. Optimization of the family empowerment approach depends on the existence of a model that used as a guide and reference in performing nursing services [12]. A model will have a positive and good impact as if it is developed based on the needs of providers and users of health services, especially for community and family nurses. One of the nursing models that can be applied to families is family-centered nursing model by Friedman. Family-centered nursing model focuses on the ability of nurses to provide family nursing care through family training in order to achieve improved health for all family members and they are able to maintain health issues [13]. The family center nursing model regarding family empowerment or the prevention of ARI among children is not able yet. This also gives struggle to prevent ARI that often falls into pneumonia. So, it is necessary to establish a model that has functions for



preventing ARI among less than five years old-children that is effective in the community. This model could bring empowerment and effective prevention of ARI.

σ	= standard deviation
$Z_{1-\alpha/2}$	= degree of trust (1.96)
$Z_{1-\beta}$	= test strength (0.842)
μ_1	= mean of condition before intervention (Sidiq, 2018)
μ_2	= mean of condition after intervention (Sidiq, 2018)

RESEARCH METHOD

This research uses quasi-experimental research design with a non-equivalent control group approach, pre and post test design. This study consists of an intervention group and a control group. The type of research used is pre-test and post-test to form 2 groups whose group has an initial measurement (pre-test) to determine the initial score before the intervention. The intervention of the Family Centered Nursing Model gives to treatment group in the form of health counseling, mentoring, counseling and skills demonstration. The control group receives leaflets as the usual intervention related to the public health center program. This research is conducted in Guo, the working area of Belimbing Public Health Center of Padang. The research is started from October 2019 to November 2020. The population in this study is families with children (0 to 5 years old) in Guo, the working area of Belimbing Public Health Center Padang. The sample calculation uses the unpaired categorical analysis sample size formula [14], so the sample size is:

$$n = \frac{2\sigma^2[Z_{1-\alpha/2} + Z_{1-\beta}]^2}{(\mu_1 - \mu_2)^2}$$

$$n = \frac{2(1,79)^2[1,96 + 0,842]^2}{(27,65 - 29)^2}$$

$$n = 20,15$$

$$n = 20$$

Description:

n = number of sample

Based on the results of the sample calculation, the minimum number of samples obtained is 20. The sample in the intervention group and control group is 20:20 (1:1). The total sample is 40 people which used purposive sampling as the sampling technique. Determination of the sample is based on these following criteria:

a. Inclusion criteria

Inclusion criteria in this study are:

- 1) Main family
- 2) Families living at home with children/toddlers
- 3) Families who are willing to be respondents.
- 4) Families who have good communication and reading and writing skills.

b. Exclusion criteria

Exclusion criteria in this study are: families who have physical, mental, or cognitive limitations who could interfere with this research.

c. Drop out Criteria

Drop out criteria in this study are:

- 1) Subjects that do not follow the whole research process.
- 2) Resigned subject.
- 3) Subject suffers from other respiratory diseases (asthma, etc.).



RESULT

The results showed that a mean age of the mothers in the intervention group is 35 years, a minimum age of the respondent is 23 years and a maximum age is 47 years. Meanwhile, in the control group, a mean age of the mother is 36 years, a minimum age is 26 years and an

maximum age is 46 years. Children in the intervention group had an average age of 38 months, a minimum of 14 months and a maximum of 60 months. In the control group, the mean age of the children is 31 months, a minimum of 8 months and a maximum of 60 months.

The results of the research data bivariate analysis are presented as follows:

Table 1. Analysis of Differences in the Level of Family Independence Before and After Getting Treatment in the Case Group

Sub Variable	Group	N	Mean	SD	p value
Family independence in accepting health workers	Pre Test	20	3.00	0.00	-
	Post Test	20	3.00	0.00	
Family independence in accepting health services	Pre Test	20	4.00	0.00	1.000
	Post Test	20	4.00	0.00	
Ability in explaining ARI	Pre Test	20	6.45	1.47	0.023
	Post Test	20	7.55	1.15	
Utilization of Health Services	Pre Test	20	5.45	0.83	0.149
	Post Test	20	5.80	0.69	
Taking Action	Pre Test	20	5.00	1.34	0.048
	Post Test	20	5.75	0.44	
Doing Prevention	Pre Test	20	7.75	1.07	0.003
	Post Test	20	8.70	0.47	
Washing the hands properly	Pre Test	20	9.05	1.05	0.035
	Post Test	20	9.45	0.76	
Cough Etiquette	Pre Test	20	4.65	0.49	0.083
	Post Test	20	4.80	0.41	

Table 1 illustrates that in the case group before and after treatment, family independence in receiving health services, utilization of health services, cough etiquette ($p > 0.05$) which means that there is no significant difference between pre-test and post-test. Family independence in preventing the value of $p = 0.003$, washing

hands properly and correctly with a value of $p = 0.035$, ($p < 0.05$) which means that there is a significant difference between the pre-test and post-test.



Table 2. Analysis of Differences in Family Independence Levels Before and After Getting Treatment in the Control Group

Sub Variable	Group	N	Mean	SD	p value
Family independence in accepting health workers	Pre Test	20	3.00	0.00	1.000
	Post Test	20	3.00	0.00	
Family independence in accepting health services	Pre Test	20	4.00	0.00	1.000
	Post Test	20	4.00	0.00	
Ability in explaining ARI	Pre Test	20	6.85	1.73	0.121
	Post Test	20	7.35	1.31	
Utilization of Health Services	Pre Test	20	5.55	0.99	0.102
	Post Test	20	5.80	0.52	
Taking Action	Pre Test	20	5.40	0.68	0.813
	Post Test	20	5.35	0.75	
Doing Prevention	Pre Test	20	8.05	1.47	0.010
	Post Test	20	8.75	0.55	
Washing the hands properly	Pre Test	20	9.00	1.22	0.507
	Post Test	20	8.90	0.55	
Cough Etiquette	Pre Test	20	4.75	1.21	0.666
	Post Test	20	4.75	0.64	

Table 2 illustrates that in the control group before and after treatment, the independence of the family in receiving workers, explaining about ARI, getting utilization of health services, taking action, and having cough etiquette (p value > 0.05) means that there is no significant difference between pre-test and post-test in the control group. Family independence in prevention with the value of p value = 0.010 (p < 0.05)

means that there is a significant difference between the pre-test and post-test.

Table 3. The Mean Value of Family Independence Level Before Getting Treatment in Case and Control Groups (n=20)

Variable	N	Mean	SD	Min	Max
Intervention Group	20	45.35	3.40	36.0	42.0
Control Group		46.60	4.39	36.0	55.0



Table 3 illustrates that the results of the analysis showed that the mean value of the level of family independence in preventing the ARI (pneumonia) among children before receiving treatment in the intervention group was 45.35 with a standard deviation of 3.40, a minimum value

of 36.00 and a maximum value of 42.00. The mean value in the control group is 46.60 with a standard deviation of 4.39. The minimum value is 36.00 and the maximum value is 55.00, it can be seen in the following chart:

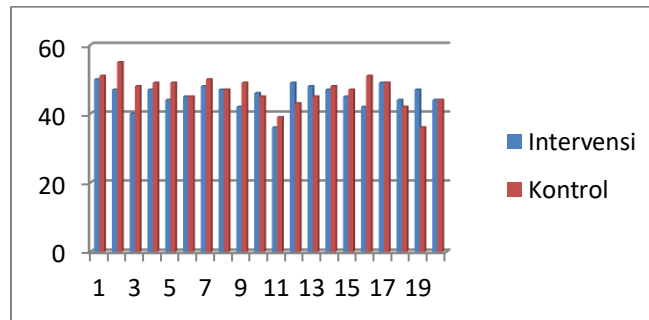


Figure 1. Pre-Test Scores of Intervention and Control Groups

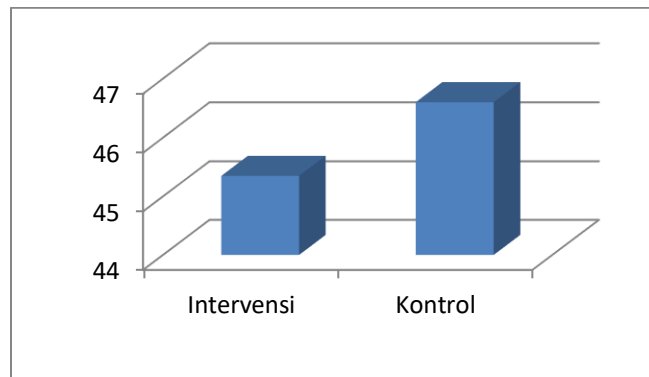


Figure 2. The Pre-Test Mean Scores of the Intervention and Control Groups

Table 4. The Mean Value of Family Independence Level After Getting Treatment in Case and Control Groups (n=20)

Variable	N	Mean	SD	Min	Max
Intervention Group		49.05	1.96	44.0	53.0
Control Group	20	47.90	1.41	45.0	51.0

Table 4 illustrates that the results of the analysis showed that the mean value of family independence level in preventing ARI (pneumonia) among children after receiving treatment in the intervention group is 49.05 with a standard deviation of 1.96, a minimum value of 44.00 and a maximum

value of 53.00. The mean value in the control group is 47.90 with a standard deviation of 1.41. The minimum value is 45.00 and the maximum value is 51.00. The following chart as belows:

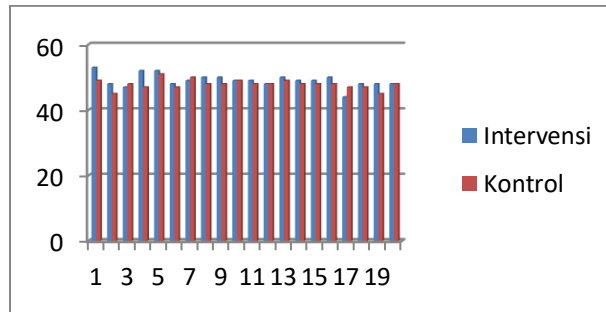


Figure 3. The Post-test Scores of Intervention and Control Groups

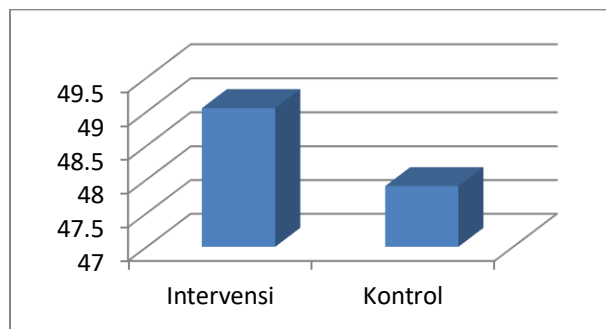


Figure 4. The Post-Test Mean Scores of the Intervention and Control Groups

Table 5. Normality Test with *Shapiro-Wilk* Test in the Intervention Group and Control Group

No.	Variable	Significant	Alpha	Description
1.	<i>Pre Test</i>	0.075	0.05	Normal
2.	<i>Post Test</i>	0.004	0.05	Not Normal



Table 5 illustrates that based on the description above, it is found that in the pre-test with the value of $p = 0.075$ ($p > 0.05$) indicates that the data is normally distributed. In the post-test with the value of $p = 0.004$ ($p < 0.05$) indicates that the data is

not normally distributed. In order to see the difference in independence of the intervention and control groups, the researcher uses Mann Whitney test.

Table 6. Mann Whitney Test Results for Independence Differences Before and After in the Intervention Group and Treatment Control Group (n=20)

Variable	Group	N	Mean	SD	p value
Pre-test Independence	Intervention	20	45.35	3.40	0.211
	Control	20	46.60	4.39	
Post-test Independence	Intervention	20	49.05	1.96	0.023
	Control	20	47.90	1.41	

Table 6 illustrates that the results of statistical tests with the Mann-Whitney test value of $p = 0.211$ ($p > 0.05$), which means that there is no significant difference between the independence before the intervention group and the control group. The results of statistical

tests using the Mann-Whitney test, p value = 0.023 ($p < 0.05$) shows that there is a significant difference between independence after treatment in the intervention group and the control group as following chart:

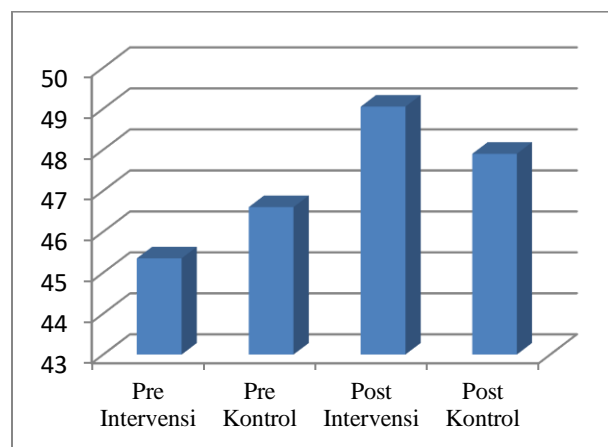


Figure 5. Mean Value of Independence Level on Differences in Pre-Test and Post-Test Assessments in the Intervention Group and the Control Group

DISCUSSION

The results of statistical analysis on family independence in preventing ARI with the value of $p = 0.003$ ($p < 0.05$) in the

case group, while in the control group the value of $p = 0.010$ ($p < 0.05$) which means that there are significant differences in family independence in the prevention of



ARI between before and after intervention with Family centered nursing model in the groups of case and control. This proves that there is an influence using family independence in the prevention of ARI among children in Guo.

Family independence has not been optimally implemented in preventing ARI because the families struggle with some problems, such as education, economy, and information about ARI. This would be better if families implied good life style, such as maintaining good nutrition and healthy dietary habit. This can be seen from the majority of parents of children who have not better education and working as the housewives. Most of them (95%) have low income which has impact on low economic status. They would not really able to buy nutritious foods, such as eggs, fish, chicken, and meat.

Nutrition is one of the important factors in preventing infectious diseases. Children with good nutritional status have immunity to infectious diseases, such as ARI. Roso (2015) said there is a relationship between the role of underprivileged families and efforts to prevent ARI among toddlers in Depok Village, Kandeman District, Batang Regency with the value of 0.00. The family as the place where family members grow and develop roles as well as gaining family functions, such as the function of family care. This function requires the family to provide food, clothes, protection, and health/nursing care that is useful in preventing the incidence of ARI among children under five [9].

The results showed that the family's independence in knowing how to prevent ARI (pneumonia) in the pre-test from the case group with the mean value of 7.75 and the value of 8.05 in the control group. In general, after the intervention or post-test the family's independence in the prevention

of ARI in the case group, the mean value has increased to 8.70. It increased either in the control group with the mean value of 8.75. Statistical results showed that the changes were influenced by the intervention of the family centered nursing model. The intervention of the family centered nursing model that has given to the case group has positive and better impact on the family.

There are several factors in order to support ARI prevention behavior in the community of Guo, in Work Area Health Public Center of Belimbing, including the availability of health facilities, medicines, educational media (enabling factors), and good behavior of health workers. However, there are still several other factors that do not support health behavior in the community, such as beliefs, values, public perceptions (predisposing factors), and physical environmental factors (reinforcing factors) [10]. Earlier, Fitri's research (2018) showed that there was a significant relationship between knowledge about ARI and ARI prevention behavior (p value = 0.000, $p < = 0.05$). There were two steps that can be implemented in preventing ARI among children, such as immunization and non-immunization [15].

Meanwhile, non-immunization prevention includes some steps, such as giving exclusive breastfeeding, good nutrition, children avoidance of cigarette smoke, kitchen smoke, environmental improvement with clean and healthy living behavior. Another factor that affects the incidence of ARI (pneumonia) among children in Guo is related to the habits of parents' when the fathers have bad smoking habit in the house (75%).

It is showed that there is a triggering factor with the incidence of pneumonia in children. This research is related to the research results of Milo & Ismanto (2015)



on the relationship between smoking habits in the home and the incidence of ARI in children aged 1-5 years at the Sario Health Center of Manado with the p-value of 0.002 ($p < 0.05$) [16]. The result showed that there was the relationship between family members' smoking habit in the house and the incidence of ARI among children. It is also reinforced by research conducted by Tina (2018) that there was a relationship between smoking habits and the incidence of ARI in children under five in the Kenali Asam Bawah Village with the p-value = 0.000 ($p < 0.05$) [17].

Children who get easily polluted by cigarette smoke in the house tend to be infected of ARI. Fathers have an important role in the family, including in the prevention of disease. The role of the father in the general family is as the head of the family and others, such as a decision maker, breadwinner, protector of risk and danger, and supporter.

Family independence in washing hands properly and correctly in the case group gets the average value of the pre-test which was 9.05 and the post-test was 9.45. The results of the statistical test value of $p = 0.035$ ($p < 0.05$) showed that there was a significant difference in family independence between the pre-test and post-test. In the control group, the average value of the pre-test was 9.00 and the post-test was 8.90. The results of the statistical test value of $p = 0.507$ ($p > 0.05$) showed that there was no significant difference between the pre-test and post-test. This means family's actions in preventing pneumonia in the case group have increased since intervention with the family centered nursing (post-test) model implemented.

Then, researcher found the mean value of the pre-test of family independence in cough etiquette was 4.65 and the post-test was 4.80. The result of the statistical test value of $p = 0.083$ ($p > 0.05$) in the case

group showed that there was a significant difference between the pre-test and post-test. In the control group, the mean value of the pretest was 4.75 and the post-test was 4.74. The results of statistical tests using the Wilcoxon test value of $p = 0.666$ ($p > 0.05$) indicated that there is no significant difference between the pre-test and post-test.

In this study, respondents were given a family centered nursing model intervention. The intervention included health counseling, guidance, and demonstrations on how to prevent ARI (pneumonia) by washing hands properly and having cough etiquette. They were also provided with ARI prevention module. Post-test result showed the increased average score in the case group. Researchers asked respondents to show how to do cough etiquette correctly. Most of the respondents were unable to practice cough etiquette in accordance with the correct procedure because most of them did not cover their mouths using a tissue. They did not use the mask and did not wash their hands properly while they covered the sneeze and cough only with hands.

Various studies have shown that good and correct hand washing behavior using soap can prevent disease transmission and reduce numbers of disease. One of the studies conducted by Luby (2015) revealed the fact that the habit of washing hands used soap was the simplest preventive measures to reduce mortality from diarrhea and ARI [18].

Based on a review conducted by Charlotte (2012), it is related to the effectiveness of hand washing with soap with the incidence of ARI and influenza. It was found that washing hands with soap is an important basic thing to do but not specific enough to prevent the occurrence of ARI. Optimizing the prevention of ARI (pneumonia) can be done by combining two important things, such as hand



washing with soap and using proper mask [19].

Arifianto (2017) explained that ARI (pneumonia) is transmitted through droplets or small droplets of saliva or respiratory fluid when sneezing or coughing containing viruses and bacteria that are spread to various surfaces, including hands that will touch the mouth and nose. Using proper masks, limiting contact with patients with ARI (pneumonia) and practicing cough etiquette properly and correctly are appropriate preventive steps related to ARI (pneumonia) [20]. Sari's research (2013) showed that the combination of using masks and washing hands properly with soap in the treatment group was more effective in preventing acute respiratory infections than non-combined interventions in the control group [21].

The results of the analysis showed that the average value after the intervention group was 49.05 while in the control group was 47.90. The results of statistical tests using the Mann-Whitney test with the p value = 0.023 ($p < 0.05$), which means that there is a significant difference between independence after treatment and the intervention of the FCN (Family Centered Nursing) Model in the intervention group and the control group. It can be concluded that the intervention using the Family Centered Nursing model is effective on the level of family independence.

The results showed that most of the respondents in the case group and control group were at level I of independence during the pre-test. After using the family centered nursing (post-test)-based family empowerment intervention, in general the level of family independence in preventing ARI (pneumonia) in the treatment group increased to the categories of level II of independence, level III of independence and level IV of independence. The results of

statistical tests in the case group showed a significant difference in the level of family independence in preventing ARI (pneumonia) before and after the intervention. The control group did not show any difference.

The level of family independence is an indicator in assessing the extent to which family health tasks have been fulfilled by the family itself [13]. Some aspects related to family independence include: accepting health workers to receive health services according to the nursing plan; knowing and be able in revealing health issues, knowing the utilization of health facilities; performing simple nursing actions; taking precautions; taking the improvement actions (promotion) [8].

Prevention and treatment of ARI with the FCN (Family Centered Nursing) Model strategy is expected to provide optimal results which in its implementation it also develops educational activities, such as health counseling, guidance, demonstrations and discussions.

Health education is one of the empowerment processes, which is believed to increase family knowledge in order to empower family in gaining related information. With lot information it would make easy for family to gain more knowledge which will build the confidence in the family as according to its role in family. The process starts from providing information, identifying family resources, building family confidence through the process of thinking, remembering and recognizing things that can improve family abilities and skills. So, the empowerment process produces the final result in the form of family independence [22].

Implementation of interventions using a family centered nursing model through home visits can provide opportunities for families to obtain information of pneumonia,



health prevention, and the ways to care children at home. This means there is an impact in increasing the family's ability to recognize ARI (pneumonia). Interventions using family centered nursing model create active families to prevent ARI with their knowledge about the importance of utilizing health services in order to get appropriate health treatment.

CONCLUSION

In conclusion, there is no difference in the level of family independence in the prevention of ARI (pneumonia) among children before receiving treatment with the family centered nursing model in the case and control groups with p value = 0.211 ($p > 0.05$). There are differences in the level of family independence in preventing ARI (pneumonia) among children after receiving treatment with family centered nursing model in the case and control groups with p value = 0.023 ($p < 0.05$).

SUGGESTION

It is necessary to optimize the family's ability to be independent in actively seeking information on children's health by using daily used media. Father's participation is very important in increasing family independence based family centered nursing because it is related to his role in making decision and protecting children against the risk of ARI disease.

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