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THE CONTINUOUS CARE INTEGRATION MODEL INCREASES FAMILY INDEPENDENCE OF POST-STROKE PATIENTS

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ABSTRACT

Families of post-stroke patients are often not independent in the follow-up care of their family members, this can have an impact on the family and the patient. A suitable integrated continuity of care model is needed to improve family independence. This study therefore aims to study whether an integrated model of continuing care can improve the independence of families of post-stroke patients. Methods: This research design is a quasi-experiment with pre and post-test control group design. The intervention group received inperlat model treatment, the control group did not receive the intervention. The sample of this study was the family of post-stroke patients with family members after undergoing hospitalization at the Bukittinggi Brain Hospital consisting of 28 case groups and 28 control groups with the sampling technique being convenience sampling. Measurement of family independence was carried out three times, namely before, after two months, and after 4 months after the intervention was carried out. Results: There was a significant difference in family independence in the case and intervention groups after measurement in both groups before (p-value = 0.000), after two months (p value = 0.000), and after four months (p value = 0.000) the Inperlat model was carried out. Conclusion: The Continuous Care Integration model is effective in increasing the independence of families of post-stroke patients after 2 months and after 4 months.

***Keywords**: Continous Care, Integration, Independence, Post-Stroke Family*

INTRODUCTION

Continuing care of post-stroke patients has not received full attention so far. WHO (2018) states that continuity and coordination of care is a global priority for reorienting health services because it is a community need. Several studies have shown that continuing care is important and provides benefits to patients or families. Rezapour & Nasrabad (2018) stated that the transition of care from hospital to home is very important because a smooth transition from hospital to home ensures that patients receive consistent and continuous care, which is very important to prevent complications or other health problems. Lack of resources, including knowledge and skills in caring, is a critical

challenge experienced by families (Muthucumarana & Samarasinghe, 2018). Gray *et al.* (2018) stated that there is a need for policies from the government and health workers for continuous care in primary care.

In West Sumatra it self, it is also seen that the continuity of nursing care for post-stroke patients from hospitals to health centers and homes The continuity of hospital services to the community can be linked to the discharge planning program. The results of research by Wong *et al.* (2011) in Hong Kong found that several things cause the lack of a patient discharge planning program from the hospital, namely policy standards and lack of communication and coordination between different healthcare providers. According to Kuo *et al*. (2021) nurses need to plan for patient discharge, which is included in Continuity of Care (COC). Therefore, before patients are discharged from the hospital, there must be a good discharge plan to help them manage their health conditions after discharge. So that the coordination of care for patients at home is integrated.

Saputra & Lusmilasari (2017) suggest that integration between health facilities is needed so that there are no longer fragmented services. Integration of health services is considered important in achieving effective and efficient services for patients in general and for long-term patients with conditions that have multiple morbidities in particular. Similarly World Health Organization, (2016) stated that health service integration is the alignment and coordination of different health and support services to meet the needs of a particular patient or population.

This study according to the researcher is important to do, because post-stroke patient care needs to be continued at home and most of it is done by the family. Not all families have a good readiness and understanding of stroke care at home. This is by the statement of Mukhti et al., (2022) stating that most post-stroke patients will be treated at home by family caregivers with limited abilities. This is also in line with the results of research by Muthucumarana et al. (2018) which states that families in Sri Lanka do not receive formal preparation for care from health professionals when patients are discharged from the hospital. In addition, there is no established family support system at the community level in the health care system in Sri Lanka. Therefore families need to be involved in the care of family members. This is in line with the statement of Dharma et al., (2021) which states that the role of the family is very important in improving the quality of life of post-stroke patients, the family provides long-term intensive assistance. Learning how to care for and guide patients to adapt to life after a stroke is very important to the family's ability.

A good family's ability to care for post-stroke family members can show family independence. Family independence is defined as the family's ability to care for family members at home, taking action to meet the physical, psychological, social, and spiritual needs of family members (Friedman & Bowden, 2018). Family independence is one of the focuses of assessment in family nursing care. Nurses can evaluate family independence by referring to the implementation of family health tasks as part of efforts to achieve healthy families with effective communication, and family coping strategies (Hayati, 2018). Family independence is needed in caring for family members with stroke and the care provided is as a continuation of patients from the hospital to accelerate recovery and prevent complications. Therefore, nurses need to prepare families so that family independence occurs. Some research results also state that providing interventions through training, and education conducted by nurses increases positive aspects of family skills and

psychosocial family of post-stroke patients.

Based on the phenomenon that the researchers found, the researchers to develop an integration model for sustainable nursing services. Interventions carried out through integrated continuing care are expected to increase self-efficacy, coping, and family independence. Research related to stroke-related continuing care models has been carried out in several countries in the world, but researchers have not found research on models related to continuing care in Indonesia, especially integration models that are predicted to have an effect on three aspects, namely coping, self-efficacy and family independence with post-stroke patients. Therefore, this study aims to determine whether the sustainable care integration model can increase family independence.

METHODS

This research design is a Quasi-Experimental Pretest-Posttest Group Design consisting of case and control groups. Measurement of family independence variables was carried out three times, namely before, after two months, and after four months. Instrument The sample in this study was the family of post-stroke patients, where family members had just finished undergoing post-stroke treatment in the hospital, especially the Bukittinggi City Brain Hospital. The sample criteria in the case group family are: 1). Families of post-stroke patients who live in Bukittinggi City and East Agam, 2). Families of post-stroke patients who can read and write, 3). Families of post-stroke patients who are willing to be research subjects and are willing to receive treatment from the interventions carried out, 4). Willing to participate in activities from beginning to end, 5). Families who are involved in the care of post-stroke patients and 6). Families who have blood relations/kinship with post-stroke patients. While the control group is the same in principle, the only difference is the aspect of the family of post-stroke patients who live outside Bukittinggi City and East Agam Regency. Sample size for a family of post-stroke patients based on large sample calculations using a 2 mean differential hypothesis test on two dependent groups (Hardisman, 2020). After the sample was calculated with the formula, the number of samples was 50 (25 intervention groups and 25 control groups). To anticipate the drop-out, then added 20%, so that the samples amounted to 60 people with each group of 30 people (control and intervention). In the implementation of the study there were as many as 2 respondents drop out of each group so a total of 56 respondents (28 intervension group dan 28 control group). This is because some respondents died, and some moved out of other cities with family members. The sampling technique was convenience sampling.

Procedure for Conducting The Study

This study was conducted in case and control groups. The control group was not given treatment while the case group was given the sustainable care model treatment. Initial data collection (Pre) in the case and control groups was carried out when the patient was discharged from the hospital. The second and third measurements in the control group were carried out when the patient made a re-visit to the hospital and the case group was carried out at home during the visit. The implementation of this model consists of three stages, namely the preparation, implementation, and monitoring and evaluation stages. The implementation of this model in respondents through the first stage is the provision of nursing resumes by nurses on patients discharged from the hospital, the resume is then given to the community health center nurse. There were 11 nurses involved in this study who

had previously been trained in stroke care at home using lecture, demonstration, and role play methods for three days, and also two undergraduate nursing students.

Researchers together with health center nurses conducted home visits for 4 months. In the first two months, home visits were conducted once a week eight times, and in the following two months, the visits were once a month and were part of monitoring and evaluation. Home visiting activities are carried out through various interventions in the family, namely case management, empowerment, collaboration, coordination, education, consultation, and counseling.

The application of case management is carried out by applying family-based post-stroke patient nursing care using a nursing care format. Nurses perform care documentation integrated with the Healthy Indonesia Program-Family Approach. Family empowerment was carried out in this study by involving families in the care of family members. Families are taught and trained regarding the care of family members at home such as physical exercise, self-care so that it is hoped that families can take care of family members. Collaboration and Coordination are realized through hospital nurses and community health center nurses through the provision of nursing resumes to community health center nurses containing patient conditions and data after undergoing hospital care. Education is carried out through lectures, questions and answers, and demonstrations. Educational topics provided are related to stroke disease, prevention of recurrence, self-care, stress management, and communication techniques. Counseling and consultation interventions are carried out by providing opportunities for families to convey, and express problems or obstacles experienced by families in caring for family members so that it is expected to reduce their depression. The data collection process was carried out from February 2023 to August 2023 starting with the provision of a nursing resume, up to monitoring and evaluation.

This research instrument used a family independence questionnaire with 16 statement items (Hayati, 2018). This instrument uses a Likert scale from 4 (always) to 1 (never). This instrument has been tested with item correlation values ranging from 0.468-0.898 and reliability tests with Cronbach alpha greater than r table (0.761 > 0.235) so that it is declared valid and reliable.

Data analysis in this study was carried out using bivariate analysis and multivariate analysis. A bivariate analysis of family independence of stroke patients was conducted to test the homogeneity of family characteristics between the two groups. We analyzed differences in family characteristics between the two groups on a categorical scale such as age, education, gender, income, patient-caregiver relationship, and family living in the same house. While the difference in caregiver age between the two groups was analyzed using the independent t-test and T test. Results The multivariate analysis in this study used a general linear model (GLM) to determine the effectiveness of the continuing care integration model.

Research Ethics: This study has obtained a research ethics permit from the Ethics Committee of the Faculty of Medicine, Unand with number 568/UN.16.2/KEP/FK-2021.

RESULTS AND DISCUSSION

Table 1. Frequency distribution of post-stroke patient characteristics in the control group and intervention group February - August 2023 (n = 56)

Characteristic Variables	Control Group (n=28)		Intervention Group (n=28)		P value
	f	%	f	%	
Age Group					
Adults (20-59)	18	64,3	7	25,0	**0.009**
Elderly(≥ 60)	10	35,7	21	75,0	
Gender					
Male	17	60,7	13	46,4	0.292
Female	11	39,3	15	53,6	
Employment Status					
Work	7	25,0	3	10.7	0.169
Not working	21	75,0	25	89.3	
Family Income					
≥ 4,2 IDR	7	25,0	5	17,9	0.524
< 4,2 IDR	21	75,0	23	82,1	
Last Education					
Not in school	1	3,6	1	3,6	0.910
Elementary School	11	39,3	9	32,1	
First High School	4	14,3	5	17,9	
High School	7	25,0	10	35,7	
College	5	17,9	3	10,7	
Family History					
No	6	21,4	7	25,0	0.757
Yes	22	78,6	21	75,0	
History of Recurrent					
Not Recurrent	16	57,1	19	67,9	0.417
Recurrent	12	42,9	9	32,1	
Frequency of Hospitalization					
1 time	16	57.1	19	67.9	0.293
> 1 time	12	42.9	9	32.1	

Table 1 shows that in the most intervention group are adults while in the control group are the elderly, and the homogeneity test results obtained p-value <0.05 so that the age group is not homogeneous. In other aspects, homogeneous data were obtained (value> 0.05) between the control and intervention groups, namely the most male gender, employment status is not working, family income < 4.2 million, high school education and have a family history of stroke and almost all respondents have a history of stroke risk diseases, namely hypertension, diabetes mellitus in the intervention group and control group.

Table 2. Family Demographic Distribution of Post-Stroke Patients in Control and Intervention Groups February - August 2023 (n = 56)

Characteristic Variables	Control Group (n=28)		Intervention Group (n=28)		P-value
	f	%	f	%	
Age Group					
Adults (20-59)	25	89,3	25	89.3	0.786
Elderly (≥60)	3	10,7	3	10.7	
Gender					
Male	11	39,3	6	21.4	0.152
Female	17	60,7	22	78.6	
Job					
State official	2	7,1	2	6.9	0.221
Private employee	4	14,3	2	6.9	
Merchant	5	17,9	3	10.7	
Farmers	4	14,3	4	14.3	
Labor	1	3,6	1	3.6	
Others job	6	21,4	5	17.9	
Not working	6	21,4	11	39.3	
Family Income					
≥ 4,2 IDR	2	7,1	4	14,8	0.397
< 4,2 IDR	26	92,9	24	85,2	
Last Education					
Not in school	0	0	1	3,6	0.900
Elementary School	6	21,5	3	10.7	
First High School	2	7,1	5	17.9	
High School	13	46,4	13	46.4	
College	7	25,0	6	21.4	
Family members at home					
Wife and husband	5	17,9	2	7.1	0.458
Wife, husband, and child	5	17,9	7	25	
Wife, husband, child, and other	18	64,3	19	67.9	
Patient's relationship with family caregivers					
Wife	9	32,1	2	7.1	**0.007**
Husband	3	10,7	4	14.3	
Parents	15	53,6	16	57.1	
In-laws	1	3,6	4	14.3	
Others	0	0	2	7.1	
Total	28	100	28	100	

Table 2 illustrates that in the intervention and control groups, the data were homogeneous (pvalue>0.05) where the most age groups in the family were adults, female gender, farmer and other occupations, family income <4.2 million, high school education, family members at home with extended family, and data were not homogeneous (pvalue <0.05) in the patient's relationship with the family

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Table 3. Analysis of Differences in Measures 1, 2, and 3 Based on Family Independence in the Intervention Group compared to the Control Group February - August 2023 (n=56)

Family Components	Intervention Group (n=28)			Control Group (n=28)			P-Value
	mean	SD	95%CI	mean	SD	95%CI	
Family Independence							
Before	54.75	5.40	52.51 - 56.99	42,21	6,37	39.98 - 44.45	0.000*
After 2 months	54.93	5.49	52.62 - 57.24	44,75	6,65	42.44 - 47.06	0.000*
After 4 months	54.82	4.74	56.64 - 57.00	44.46	6.63	42.28 - 46.65	0.000*

Based on Table 3 data the average family independence in the intervention group tends to be higher than the control group both before, after, and after four months. The results of statistical tests through the General Linear Model Test on family independence in the first, second, and third measurements in the intervention and control groups are significant differences where the p-value is 0.000 <0.05 in three measurements, namely before intervention, 2 months after intervention and 4 months after intervention. This indicates that the Inperlat Model has an effect on increasing family independence after 2 months and up to 4 months of intervention.

Diagram 1. Mean Score of Family Independence in Intervention Group compared to Control Group February - August 2023 (n=56)

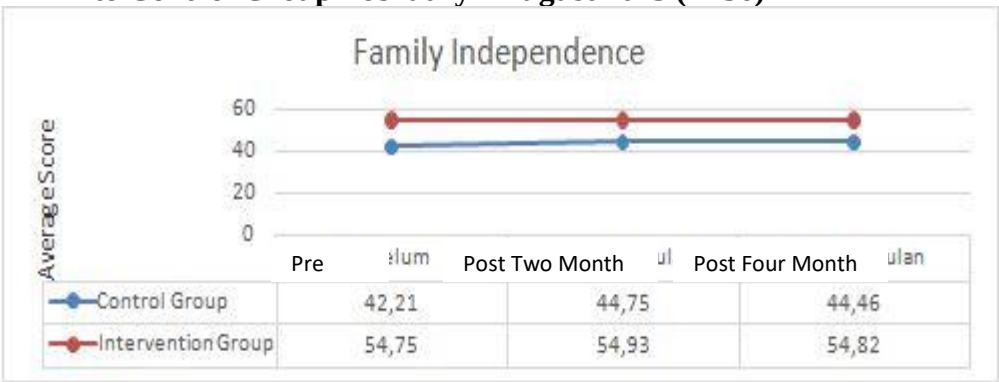

Diagram 1 shows a graphical representation of the average score of family independence in the intervention and control groups, which increased in the second measurement, and decreased in the third measurement. The mean score of family independence in the control and intervention groups was highest after the second month where the intervention group averaged 54.82 and the control group 44.75. Based on the category of family independence, it can be seen that the intervention and control groups before, in the first two months, and after 4 months were high.

DISCUSSION

In the dependent t-test test in the case group there was a significant difference between the independence scores before (M = 54.75 with SD 5.40) and after two months (M = 54.93 with SD 5.49) after an integrated care model with a p-value of 0.022 < 0.05 and there was a significant difference in family independence after 2 months with four months (54.82 with SD 4.74.) after an integrated care model with a p-value of 0.896 > 0.05. The average score of independence pre-, and after two months increased and four months experienced a

slight decrease. These results indicate a significant increase in family independence after the application of the integrated model of sustainable care, especially after 2 months.

This study showed that the mean score of family independence in the intervention group increased significantly from pre in the second month, while in the following four months, there was a decrease but not significant. The results of this study are consistent with the statement of Salamung *et al*. (2021) that many studies have shown that family nursing interventions can increase family knowledge, awareness, and ability to care for family members who experience health problems, including stroke. The results of this study can be attributed to several factors, including family demographic factors, patient conditions and also nurses and family interactions. Based on family data, it was found that the majority of families treating were women (78.6%), having the most relationship with the patient, namely the parents (57.1%). Furthermore, family experience in treating with frequency treated >1 times (42.9%) may be affected.

Another factor that caused family independence to increase in the second month can be attributed to the intense interaction between nurses and families. In the first two months, the nurse made intense visits to the family once every week for eight times. This is a form of relational continuity intensity between nurses and families. Several studies have also shown that patients and families value relational continuity, especially for more serious conditions such as cancer, psychological problems, and family problems (Kuo *et al*., 2021).

It is also supported by research results on family responses to family independence instruments. Based on the number of responses to the family's declaration of independence, the highest scores obtained were if a family member could not be treated in the puskesmas immediately taken to the hospital (score 107), appreciation of health workers who were willing to assist in the care of family members (score 105), and treatment of a stroke family member as directed by a health worker (score 104).

In the control group, the average family independence score at the first measurement was 42.21 with a deviation standard of 6.37. The average family independence score after 2 months was 44.75 with a deviation standard of 6.65. The average family independence score in the control group after 4 months was 44.46 with SD 6.63. The results of the statistical test, after the second measurement obtained a p-value of 0.000 <0.05, which means that there is a difference in family independence in the first measurement and after 2 months. The results of the statistical test after 4 months obtained a p-value of 0.009 <0.05 means that there is a significant difference in family independence after 2 months and after 4 months. This can also be seen from the decrease in family independence score (from 44.75 to 44.46).

The results of this study are consistent with research Sutin *et al*. (2022) which states that family readiness in caring for stroke patients also affects the family's ability to care for patients at home. The results of this study indicate that most families do not have the readiness of knowledge to care for stroke patients. In this study, it was found that the lack of family independence could be attributed to the absence of interventions carried out to the control group so that the family was not ready to carry out family healthcare functions, family demographic data including that the family was the first time caring for a patient (57.1%) so that this could also affect family knowledge and family experience about stroke which could have an impact on their ability to care. Furthermore, the socio-economic level obtained in the family economic

level is mostly middle to lower class (75% in the control group).

Families are often unprepared to handle stroke patients. Nurses need to improve family function in caring for family members so that it is hoped that families can have independence in caring for their family members. White *et al*. (2015) stated that families who have good coping with the burden and have an adequate level of independence are an important part of the holistic nursing care process. Family independence in the health care of stroke family members is needed because of several things including: (1) families are often the primary caregivers for stroke patients and they need to provide emotional, physical, and financial support to patients (2). Families can assist in managing issues related to patient safety, daily activities, and changes in cognitive and emotional functioning after stroke, (3) Family members influence decision-making and play both positive and negative roles (Guo & Liu, 2015).

Based on the General Linear Model (GLM) test of differences between intervention and control groups, it was found that there were differences in family independence between the intervention group and the control group before, after two months, and after four months. There was a significant difference (p-value 0.000) in three measurements, namely before the intervention, two months after the intervention, and four months after the intervention. This shows that the Continuous Care Integration Model affects the independence of families of post-stroke patients.

The results of this study are in line with Kuo *et al*. (2021) which states that the importance of implementing a continuity of care model for case management in healthcare institutions to meet the individual care needs of stroke patients and family involvement in the care of family members is very important. The results of this study are in line with the results of previous research conducted by Pitthayapong *et al*. (2017) the results of his study showed that family caregivers who participated in the post-stroke care intervention program experienced an increase in post-stroke care skills, thereby increasing the ability to perform ADLs and reducing complications in post-stroke patients.

The results of another study by Ghazzawi *et al*. (2016) where it was concluded that relationships with health providers, informational support, and continuity in case management influenced the experience of caring for families and ultimately improved the quality of care for stroke patients, during the transition to home from rehabilitation facilities. Similar research conducted by Chan *et al*. (2022) about the RE-AIM framework for evaluating family-centered hospital-to-home programs found that the Carer Matters Program helps families in the transition from hospital to home by providing emotional support, knowledge, and skills to families. According to Kuo *et al*. (2021) continuous care has a significant impact on families. First, continuing care can help families understand the health conditions of their family members and how to take good care of them. This can help reduce stress and anxiety that may be experienced by the family and can improve the quality of life of each family member.

In this model, improving family independence is done through relational and informational continuity between nurses and families through interventions. This is following what Hagedoorn *et al.* (2020) stated that the quality and continuity of care for the elderly are expected to improve when nurses collaborate with families as partners in care. The process of establishing partnerships is carried out since the family is in the hospital when going home by providing a nursing resume. This is also in

line with the results of research by Krishnan *et al*. (2019) which emphasizes the importance of involving families and caregivers in the process of discharge planning and post-acute care.

According to Tosun & Temel (2017) the lack of family ability to care can be due to the lack of education and training provided to families. Kaakinen et al., (2015) states that nurses must use evidence-based knowledge to empower families with information, skills, and abilities to manage chronic diseases throughout life and prevent complications and comorbidities. Knowledge allows family members to contribute to preventing side effects or minimizing stroke complications (Simanullang, 2018). Dharma et al., (2021) state that education that needs to be given to families and post-stroke patients is related to management in daily activities, mobility, communication, safety, and disease management. Families are also expected to be able to manage the care of family members through several things including: scheduling medications, conducting repeat controls, and coordinating the necessary care.

According to Yu *et al*. (2021) a critical period in care for stroke patients and families is the transition of care from hospital to home because in this period it is necessary to develop self-management capacity and lay a solid foundation for long-term post-stroke recovery and rehabilitation. This is also in line with Tosun & Temel, (2017) which states that to provide direct support and care to stroke patients and their families, home visits must be carried out. The home visits carried out in this study are relevant to the opinion of Usman *et al*. (2020) which states that families of post-stroke patients need emotional support in ongoing care at home.

The results of the intervention of applying this Inplerlat model can also be seen from the answers to family statements on independence, the highest scores obtained are if family members cannot be treated at the health center, they are immediately taken to the hospital (point 107), appreciate health workers who are ready to help care for family members (point 105) and take care of stroke family members according to instructions from health workers (point 104). This is also following the results of research by Merino *et al*. (2017) regarding the Development of a New Integrated Care Organization Model for Patients with Complex Needs in the Basque Country which found that this model shows the satisfaction of professional patients and families, while the profile of patient service use has moved from secondary to primary care.

The results of this study can also be attributed to family and patient demographic factors. It was found that the majority (89.3%) of family caregivers were adults, female (78.6%), the family was large (92.9%), and more than half had high school and university education (57.6%). Based on patient data, it was found that they had been treated> 1 time (32.1%). Some research results show the same thing as this study, including research by Yu *et al*. (2019) which states that the ability of families to care for stroke patients at home can be influenced by their age. Most families who care for stroke patients at home are women (Apriliyanti *et al*., 2022). Furthermore, it states that family behavior in caring for stroke patients at home can be influenced by their level of education. Families who have a higher level of education tend to have a better understanding of health conditions, the care needed, and ways to support the recovery process *(Santana et al*. 2017).

CONCLUSION

Family independence can increase after a sustainable care integration model is carried out so that this is expected to accelerate patient recovery. This

sustainable care integration model is expected to be used by health center nurses in increasing their role in providing sustainable care for post-stroke patients and can become a policy by the relevant health department.

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