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Prevention of hypertension by changing behaviour through family empowerment method

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ABSTRACT

The Hypertension is the most common cause of cardiovascular events and is a major problem in both developed and developing countries. Cardiovascular disease is also the number one cause of death in the world each year. The objective of this research is to determine the effect of the family-centred empowerment model on changes in family behaviour in preventing hypertension in the Mafututu Village, Tidore Kepulauan City. The method used in this study is quasi-experimental, more specifically the non-equivalent control group (nonrandomized control group pre-test, post-test design). This study uses a total sampling technique, which is the same sampling with the existing population. The results of the Kruskal Wallis statistical test on the pretest value of the intervention group with the control group obtained p-value = 0.439 with a significant level of 0.05. This indicates that the p-value is more than the significant level value (0.439> 0.05). There are differences in behaviour (knowledge, attitudes, and actions) of poor families in preventing hypertension in families before and after the intervention of the family-centred empowerment model. The family-centred empowerment model intervention influences the behaviour of poor families in preventing hypertension in the family

Keywords
Family Centered Empowerment, Behaviour, Hypertension

Introduction

Hypertension is a significant public health problem and is one of the leading causes of premature death worldwide. nearly 1.13 billion people worldwide suffer from hypertension. a 2015 survey showed that 1 in 4 women and 1 in 5 men have hypertension (World Health Organization, 2019), and more than 9 million deaths worldwide are associated with hypertension (Kingue et al., 2015). Well-managed and managed hypertension results in a better quality of life and a reduced risk of complications, which include coronary artery disease, heart failure, cerebrovascular disease, and chronic kidney disease(Lamelas et al., 2019). An estimated 17.7 million people died of heart disease in 2015, (World Health Organization, 2013). The report states that complications of hypertension causes 9.4 million deaths worldwide each year (Lim et al, 2012). of these deaths, an estimated 7.4 million were caused by coronary heart disease and 6.7 million were caused by stroke (World Health Oragnisation, 2015)

The global prevalence of hypertension has increased dramatically over the last twenty years. Globally, at least 1 billion people suffer from hypertension (Kingue et al., 2015). Southeast Asian countries such as Malaysia, Indonesia, Singapore, the Philippines, Vietnam, Laos, Cambodia, Myanmar, and Timor Leste are not spared from cases of hypertension. Approximately one-third of Southeast Asian adults are currently diagnosed with hypertension, and an estimated 1.5 million deaths are related to hypertension each year (World Health Organization, 2018)

Globally, about 20% of women and 24% of men aged 18 years and over experienced an increase in blood pressure in 2015 (Organization, 2018). Many of the population affected by hypertension are not aware that they have this disease. Thus, many of them go undiagnosed and ultimately go untreated. This is common in developing countries compared to developed countries (World Health Organization, 2013)

In Indonesia, hypertension is the number 3 cause of death after stroke and tuberculosis, where the proportion of deaths reaches 6.7% of

the death population at all ages in Indonesia (Kementerian Kesehatan Republik Indonesia, 2013). The results of the 2018 Basic Health Research show that the national prevalence of hypertension based on the results of blood pressure measurements reaches 34.1%. It is estimated that there are 15 million people with hypertension in Indonesia, but only 4% are controlled. Controlled hypertension is those who suffer from hypertension and know they are on treatment, on the other hand, 50% of patients do not realize they are hypertensive, so they tend to suffer from more severe hypertension.

There are several ways to treat hypertension such as using smartphones and Bluetooth®-enabled telemonitoring (Kitt, Fox, Tucker, & McManus, 2019), Therapeutic (Nguyen, Dominguez, Nguyen, & Gullapalli, 2010), Renal Denervation and Baroreflex activation therapy (Goit & Yang, 2019), exercise treatment (Naci et al., 2019), collaborative partnership (Carey, Muntner, Bosworth, & Whelton, 2018), Acupuncture (Zheng et al., 2018), multidrug therapy (Doroszko, Janus, Szahidewicz-Krupska, Mazur, & Derkacz, 2016). However, very few have investigated the effect of family empowerment in overcoming hypertension. Several studies examining how the influence of family can prevent hypertension have been carried out by several researchers, such as Family Support Intervention (Maryam, Resnayati, Riasmini, & Mambang Sari, 2018), Emily Health Empowerment Preventing Stroke (Marlina, Badaruddin, Fikarwin, & Lubis, 2020), more research discusses the role of the family in overcoming diabetes and other diseases.

Family empowerment is a process or effort to grow knowledge, awareness, and willingness of families to maintain and improve health status (Notoatmodjo, 2007). Family empowerment is appropriate to be applied in Bima City, considering that in terms of the social structure of the community, most of which are still traditional, with a pattern of close social relationships and interactions among family members (Andarmoyo, 2012). Family empowerment is expected to foster knowledge, understanding, and even high self-efficacy from sufferers and their families. Self-efficacy is one of the individual's self-regulatory abilities to form behaviours that are relevant to specific tasks or situations (Bandura, 1978)

The family-centred empowerment model in the family is done as a comparative health education model for changes in family behaviour in preventing hypertension in the family. This educational model was also chosen because it can strengthen the system in the family to cultivate healthy living behaviours (Rakhshan, Kordshooli, & Ghadakpoor, 2015). This model has been applied and used in several studies (iron deficiency anaemia, thalassemia, haemophilia, diabetes, asthma and epilepsy) to improve the quality of life of these chronic patients. The results show an improvement in their quality of life (Scott, Setter-Kline, & Britton, 2004).

Most studies on hypertensive patients only focus on other aspects and pay less attention to the patient's lifestyle, especially lifestyle improvements by involving family members. Therefore, this study aims to determine the effect of family empowerment in preventing hypertension.

Methods

This study uses a quasi-experimental design because it does not have strict restrictions on randomization, and at the same time, it can control validity threats (Notoatmodjo, 2014). The type of quasi-experimental design used in this study was a non-equivalent control group (nonrandomized control group pre-test-post-test design). The population in this study were all families with hypertension in Mafututu Village, Tidore Islands City. The sample in this study was 80 samples, the sample will then be divided into 2 groups, namely 40 people in the treatment group and 40 people in the sample as the control group. Sampling in this study uses a non-probability sampling technique (purposive sampling), which is a sampling technique by selecting a sample among the population as desired by the researcher

based on the inclusion criteria that have been designed by the researcher so that the sample selection can represent the characteristics of the population that has been determined previously known.

Data collection

In this study, data from the sample sought were collected 2 times, namely before the treatment (pre-test) was given and after the treatment (post-test) was carried out in both groups (one treatment group and one control/comparison group). Observations of the treatment group were carried out 2 times after the intervention and the control group was observed after 2 times of the intervention. Data collection techniques were carried out by interviewing and filling out questionnaires by the client by referring to the questionnaire that had been formulated by the researcher.

The data collection technique in this study used a pre-test and post-test answer collection technique of knowledge, attitudes and actions of families with family members having hypertension through a test instrument. The knowledge aspect questionnaire consists of 15 statements and the attitude questionnaire consists of 10 statements. The data collection instrument used in this study was in the form of a questionnaire, namely several written questions that were used to obtain information from respondents in terms of reports about their personalities or things that were known. The questionnaire used in this study refers to the Q-sort questionnaire model, which is a test to assess changes in a person's behaviour.

The type of questionnaire used in this study is in the form of a checklist using a Likert scale, which is a list where the respondent only needs to put a cross (X) in the column that corresponds to the choices ranging from Agree, Doubtful, and Disagree. The questionnaire used is a single questionnaire, namely, the questionnaire used for the pre-test is the same as that used for the post-test, intending to make it easier to see the difference in the results of the pre-test and post-test after being given treatment. To observe the implementation of the role of family behaviour, the researchers used an observation sheet that the researchers developed themselves based on the parameters that became the reference for the concept of family behaviour change itself which was formulated in the operational definition.

Data analysis

The experimental research used is quasi-experimental. The quasi-experimental design used was Non-Randomize Control Group Pre-Test, Post-Test Design. After the data is collected and examined, data analysis will be carried out to test the research hypotheses that have been determined. The data analysis carried out is a type of bivariate analysis carried out on 2 variables that are analyzed related or correlated, namely the influence of the family-centred Empowerment Model (independent variable) on changes in family behaviour in preventing hypertension (dependent variable). Because the data generated is paired data type (pre-test, post-test), a different test (significance test) will be conducted between the treatment group and the control group with a statistical test independent sample t-test, with a significance level (α) of 0.05 or 5%.

This research was conducted in the area of the Diabetes Center, Ternate City. The study population was all Diabetes Mellitus patients in the City Diabetes Center totalling 172 people. The sampling technique in this study used simple random sampling. Meanwhile, The sample used was Diabetes Center patients who routinely visited during the last 3 months. Based on the calculation results, the sample in this study was 40 people. Instruments or data collection tools in this study using a questionnaire and the adherence of diabetes mellitus patients was measured by using the MMAS-8 questionnaire (Modified Morisky Adherence Scale-8).

The study began by measuring the level of medication adherence, then gave group therapy to the respondents, and ended by measuring the level of adherence again. Group therapy is an activity aimed at a group of clients which has the aim of being able to provide therapy for all members in the group.

Researchers used two analyzes, namely univariate and bivariate. Univariate analysis to describe the variable characteristics of the respondents. Meanwhile, bivariate analysis is intended to answer the research objectives and test the research hypothesis. To determine the

difference between the dependent variable pre and post-test, the researcher used the t-dependent test and to see the relationship between the variable characteristics and Adherence used the Chi-Square test. The data were then analyzed using a computer program with an error rate of $\alpha = 0.05$.

Results and Discussions

The results of Univariate Analysis

Table 1: Univariate Analysis Results of Characteristics of Respondents

Intervention Group					Control Group				
Variabel	Pre-Test		Post-Test		Variabel	Pre-Test		Post-Test	
	n	%	n	%		n	%	n	%
Knowledge									
High	28		39	72,5	High	30		8	5
Moderate	20		12	22,5	Moderate	21		38	70
Low	12		9	5	Low	9		14	25
Attitude									
Well	5	7,5	38	75	Well	2	5	2	5
Enough	20	37,5	20	22,5	Enough	22	35	23	37,5
Less	35	55	2	2,5	Less	34	60	35	57,5
Action									
Well	5	12,5	38	70	Well	2	5	5	12,5
Enough	35	52,5	16	27,5	Enough	20	37,5	30	50
Less	20	35	6	2,5	Less	38	57,5	25	37,5
Total	**60**	**100**	**60**	**100**	**Total**	**60**	**100**	**60**	**100**

The results of the analysis of differences in the pretest value of family knowledge in preventing hypertension, it is known that the results of the interpretation in the intervention group (family centered empowerment model) of 28 respondents (%) have high knowledge, 20 respondents (%) have moderate knowledge, and 12 respondents (35%) have low knowledge about prevention of hypertension. These results are not much different from the results of the control group pretest, as many as 30 respondents (%) have high knowledge, 21 respondents (%) in the control group have moderate knowledge, and 9 respondents (%) have low knowledge about prevention of hypertension.

The results of the analysis of differences in the posttest value of family knowledge in preventing hypertension, it is known that the results of lposttest in the intervention group (family centered empowerment model) showed 39 respondents (72.5%) with a high level of knowledge, 12 respondents (22.5%) with moderate knowledge, and 9 respondents (5%) with low knowledge. While the level of knowledge about prevention of hypertension in the control group there are 8 respondents (5%) with high knowledge, 38 respondents (70%) with moderate knowledge, and 14 respondents (25%) with low knowledge.

The results of the analysis of differences in the value of family attitudes to prevent hypertension, it is known that the results of the pretest in the intervention group (family centered empowerment model) of 5 respondents (7.5%) have a good attitude, 20 respondents (37.5%) have an adequate attitude, and 35 respondents (55%) have less attitude towards the prevention of hypertension. The results were not much different from the results of the control group, as many as 2 respondents (5%) had good attitudes, 22 respondents (35%) in the control group had sufficient attitudes, and 34 respondents (60%) had less attitudes towards the prevention of hypertension. The attitude of the respondents before being given the intervention some have

enough attitude and some have less attitude in preventing hypertension in the family.

The results of the analysis of differences in the posttest value of family attitudes in preventing hypertension, it is known that the posttest results of 38 respondents (75%) in the intervention group (family centered empowerment model) showed a good attitude in preventing hypertension in the family, 20 respondents (22.5%) had an attitude enough, and 2 respondents (2.5%) have less attitude. However, there were only 2 respondents (5%) with good attitude in preventing hypertension in the control group, while respondents with sufficient attitude were known as many as 23 (37.5%) and 35 respondents (57.5%) had less attitude.

The results of the analysis of differences in the pretest value of family actions in preventing hypertension note that the results of the pretest in the intervention group (family centered empowerment model) ie only 5 respondents (12.5%) had good actions, while as many as 21 respondents (52.5%) had actions enough, and 14 respondents (35%) have less action in preventing hypertension. The results are not much different from the results of the pretest of the control group, as many as 2 respondents (5%) have a bauk action, 15 respondents (37.5%) in the control group have actions enough, and 23 respondents (57.5%) had less action in preventing hypertension. The respondent's actions before being given the intervention showed that most of them did not take hypertension prevention measures on the family.

The results of the analysis of differences in the posttest value of family actions in preventing hypertension in table 5.12, it is known that the results of the posttest in the intervention group (family centered empowerment model) showed good actions in preventing hypertension in the family of 38 respondents (70%), as many as 16 respondents (27.5%) have enough action, and only 6 respondents with less action (2.5%). However, respondents with good actions in preventing hypertension in the control group were only 5 respondents (12.5%), while respondents who had enough action were 30 people (50%) and less action were 25 people (37.5%).

Table 2: Bivariate Analysis Results of Study Variables

Pre-test				***Post-test***			
Variabel	**n**	***Asymp.Sig.***	***P Value***	**Variabel**	**n**	***Asymp.Sig.***	***P Value***
Knowledge							
High	16	0,439	>0,05	High	8	0,005	<0,05
Moderate	24			Moderate	38		
Low	20			Low	14		
Attitude							
Well	5	0,431	>0,05	Well	38	0,000	<0,05
Enough	20			Enough	20		
Less	35			Less	2		
Action							
Well	30	0,589	>0,05	Well	28	0,001	<0,05
Enough	9			Enough	11		
Less	1			Less	1		

Kruskal Wallis statistical test results on the pretest value of the intervention group with the control group obtained p-value = 0.439 with a significant level of 0.05. This shows that the p-value is more than the value of a significant level (0.439> 0.05). The conclusions that can be drawn from the statistical test are there was no significant difference in the pretest results of family knowledge in preventing hypertension between the intervention group (family-centred empowerment model) and the control group.

Kruskal Wallis statistical test results on the posttest value of the intervention group with the control group obtained p-value = 0.005 with a significant level of 0.05. This shows that the p-value is less than the value of a significant level (0.005 <0.05). there is a significant difference in the posttest results of family knowledge in preventing hypertension in the family between the intervention group (family centred empowerment model) and the control group.

Kruskal Wallis statistical test results on the pretest value of the intervention group with the control group obtained p-value = 0.431 with a significant level of 0.05. This shows that the p-value is more than the value of a significant level (0.431> 0.05). there were no significant differences in the results of the pretest family attitudes in preventing hypertension between the intervention group (family centred power model) and the control group.

Kruskal Wallis statistical test results on the posttest value of the intervention group with the control group obtained p-value = 0,000 with a significant level of 0.05. This indicates that the p-value is less than the significant level value (0,000 <0.05). The conclusion that can be drawn from the statistical test is that there are significant differences in the posttest results of family attitudes in preventing hypertension in the family between the intervention group (family-centred empowerment model) and the control group.

Kruskal Wallis statistical test results on the pretest value of the intervention group with the control group obtained p-value = 0.589 with a significant level of 0.05. This indicates that the p-value is greater than the significant level value (0.589> 0.05). The conclusion that can be drawn from the statistical test is that there is no significant difference in the results of the pretest of family actions in preventing hypertension between the intervention group (family centred empowerment model) and the control group.

Kruskal Wallis statistical test results on the posttest value of the intervention group with the control group obtained p-value = 0.001 with a significant level of 0.05. This indicates that the p-value is less than the significant level value (0.001 <0.05). The conclusion that can be drawn from the statistical test is that there are significant differences in the posttest results of family actions in preventing hypertension in the family between the intervention group (family centred empowerment model) and the control group.

Discussion

Our finding shows that the difference in the level of final family knowledge in preventing hypertension in the family between the intervention group (family centered empowerment model) and the control group is due to the provision of an intervention using a special approach model. The implementation of the intervention in the intervention group showed that many respondents were enthusiastic during implementation. Enthusiastic respondents to pay attention during the administration of the intervention due to the emphasis of certain strategies on the intervention

Strategies that emphasize knowledge and knowledge deepening are carried out in the second, third and fourth sessions in the first intervention and the third session in the second intervention. In the deepening session knowledge of each intervention was given health information about hypertension, signs and symptoms of hypertension, hypertension complications, how to reduce blood pressure using anti-hypertensive drugs, stress management, load management, and the role of family in family members with hypertension. This shows that the respondent's reaction including active and enthusiastic in the process of providing health education also determines the success and achievement of goals (Widyaningrum, D. A., Wihastuti, T. A., & Nasution, 2015).

Information provided in health education through a particular approach model can have a suggestive influence on a person's knowledge or cognitive abilities. Increased knowledge or cognitive abilities can provide a strong enough basis in assessing a thing and form a positive attitude in assessing a particular thing. Provision

of health information through health education using a certain approach model can increase subject knowledge.

Increased knowledge that occurs, will then cause awareness of the subject which causes the subject will show a better attitude according to the knowledge they have (Santi, Sabrian, & Karim, 2014). Differences in attitudes in the intervention group and the control group, due to the provision of health education with a model approach to the family about preventing hypertension. The increase in respondent prevention measures against hypertension in the family is evidenced by the presence of respondents having good actions in preventing hypertension in the family. Preventive actions taken by respondents are formed by important domains, namely knowledge or cognitive. Actions that are based on knowledge will be better than actions that are not based on knowledge. The information provided through the health education model with a family approach becomes a reference in applying hypertension prevention measures to the family (DESI ARIYANA RAHAYU, 2011).

The action taken by the respondent in preventing hypertension in the family is expected to be maintained as a factor of support for the family member who is sick to achieve good health. almina research concluded that there is a significant relationship between the knowledge of hypertension sufferers with daily eating patterns, from these studies it can be concluded that a person's knowledge influences the actions to be taken related to the hypertension diet. Likewise, the results of (Novian, 2013) study concluded that there was a relationship between the level of knowledge and dietary compliance of hypertensive patients.

The results of this study are supported by Green's theory in (Notoatmodjo, 2014) which states that knowledge comes from experience can be obtained with information obtained and will affect attitudes. If you have high knowledge, the person automatically behaves and behaves according to his knowledge. The results of (Adedoyin et al., 2010) study in Nigeria conclude that knowledge and attitudes of hypertensive patients influence blood pressure control compliance, and morbidity and mortality rates for hypertension. Patients who have good knowledge about hypertension can increase their compliance in the implementation of therapeutic programs. Likewise, the results of (Runtukahu, Rompas, & Pondaag, 2015) study concluded that there is an influence of attitudes on adherence to the hypertension diet with blood pressure in hypertensive sufferers. The results of this study are also supported by Green's theory in (Notoatmodjo, 2014) which states that attitude is part of the predisposing factors that influence in shaping a person's behaviour.

From these studies it can be concluded that family support plays an important role in controlling hypertension. Likewise the research results of (Almina Rospitaria Tarigan, Lubis, & Syarifah, 2018) in the working area of Banyuwangi's Mojopanggung Health Center concluded that there was a positive and significant relationship between family support and hypertension diet compliance. Hypertension which is considered as a silent killer is only felt as a result when a person experiences complications from increased blood pressure with symptoms that are considered trivial such as headaches or neck pain. Arteries lose elasticity or flexibility and blood pressure with age, most people experience hypertension when they are in their fifties or sixties (Staessen, Wang, Bianchi, & Birkenhäger, 2003).

Conclusion

There are differences in behaviour (knowledge, attitudes, and actions) of poor families in preventing hypertension in families before and after the intervention of the family centred empowerment model. The family centred empowerment model intervention influences the behaviour of poor families in preventing hypertension in the family. Suggestions that can be given in accordance with the results of the study are the need for training for health workers on how to implement family centered empowerment model interventions in families,

because the family is the closest support system for sick family members.

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Authorship Contributions
Arsad Suni builds concepts, designs, and searches for literature searches, while Rasdiayana does data collection, manuscript review, and manuscript finalization.

Disclosure
Authors declare that there is no conflict of interest.

Compliance with Ethics Guidelines. Prior to data collection, ethical approval was obtained from LB.02.04/2.3/153/2019 Unit Komisi Etik Penelitian Kesehatan Poltekkes Kemenkes Ternate.. Informed consent andexplanation of the research process were given to allrespondents before data collection started.

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