

CHAPTER III

RESEARCH METHODS

3.1 Research Design

Before starting the research, the research design has been prepared in advance. The following design not only includes a series of steps that must be followed, but is also designed with a clear logic to explain how the research will be conducted (Mawarti et al., 2021).

This study is a quantitative study with a quasi-experimental design. The approach applies a non-equivalent control group design, where there are two groups tested with a pre-test and post-test (two-group pre-test and post-test experiment with control group) to see the effect of the treatment given. In this experiment, the test is carried out before the treatment is given to the subject to determine the initial conditions, then the test is repeated after the treatment to observe its impact. This study involved two groups, each of which received different treatments. The focus is to see the difference in blood pressure before and after implementing the DASH diet in elderly people with hypertension (Nurdin & Hartati, 2019). The non-equivalent control group approach is similar to the pretest-posttest control group design, but in this approach, the experimental and control groups are not selected randomly (Sugiyono, 2014).

This study applies a non-equivalent control group approach, where a group of subjects are selected from a certain population. Before being given treatment, the subjects were given a pretest first. After that, they were given treatment in the form

of a DASH diet. After the treatment, the subjects were given a posttest again to measure the effect of the treatment. The instruments applied have equal weight, and the difference between the pretest and posttest results illustrates the effect of the treatment that has been given.

From Sugiyono (2014), the non-equivalent control group design can be described through the scheme in Table 3. 7 below.

Table 3. 7 Non-equivalent Control Group Design Scheme

Research Subject	Pretest	Treatment	Posttest
Experimental Group	0 ₁	X	0 ₂
Control Group	0 ₃		0 ₄

Source : Sugiyono (2014, p. 76)

Explanation :

Experimental Group : The elderly group that is given the DASH diet treatment

Control Group : The elderly group that is not given the DASH diet treatment

X : DASH diet treatment given to the experimental group

0₁ : Blood pressure results of the experimental group before treatment

0₂ : Blood pressure results of the experimental group after treatment

0₃ : Blood pressure results of the control group before treatment

0₄ : Blood pressure results of the control group after treatment

This study involved two groups, namely the control group and the treatment group. Both groups will receive education about the DASH diet through leaflets. However, in the treatment group, in addition to being given education, they will also receive assistance regarding the implementation of the diet.

3.2 Population, Sample And Sampling

3.2.1 Population

According to Darmawan (2016), the population is a large and extensive accumulation of data in a research study (Darmawan, 2016). Meanwhile, according to Sugiyono (2014), the population is a group of subjects or objects selected by the researcher for analysis and conclusion (Sugiyono, 2014). In this research, the population studied is the elderly in RT 03 RW 01 Sekarpuro Village Pakis District Malang Regency, who have been identified as suffering from hypertension based on the last month's records at the local elderly posyandu, namely a total of 30 people.

3.2.2 Sample

In addition to involving the population, this research also involves a sample selected based on the characteristics of the existing population. According to Darmawan (2016), Sample is part of the population that is being analyzed (Darmawan, 2016). Sugiyono (2014) explains that the sample is part of the population that represents the overall characteristics of that population. When the population is too large and the researcher is limited by funds, manpower, or time, the researcher can choose a sample to represent that population and draw conclusions that can be applied generally. Thus, the selected sample must be appropriate or accurately represent the population (Sugiyono, 2014).

The sample in this study was taken from the part of the population that could be reached and applied as a research subject through a sampling technique. The sample of this study was elderly people suffering from hypertension in RT 03 RW

01 Sekarpuro Village Pakis District Malang Regency. To determine the number of samples, this study applied the total sampling technique, namely taking samples that were the same as the existing population. The following technique was chosen because the population was less than 100 people. Thus, the total sample in this study was 30 elderly people with hypertension, who were then divided into two groups, namely the treatment group and the control group, with each group consisting of 15 people.

3.2.3 Sampling Techniques

According to Sugiyono (2014), the sampling technique is a way to select a sample in research. In probability sampling, each element in the population has an equal chance of being selected as a sample, while in non-probability sampling, the opportunity for sample selection is not the same for each element in the population (Sugiyono, 2014). In this research, the technique applied is non-probability sampling, with the sampling method using purposive sampling, where the sample is selected based on specific objectives relevant to the research.

Purposive sampling is a sample selection technique carried out based on special considerations from the researcher (Sugiyono, 2014). With this method, the sample is selected according to the criteria that have been determined by the researcher to meet the research objectives (Nursalam, 2017).

3.2.4 Inclusion Criteria

Inclusion criteria are the requirements or characteristics that are expected to be possessed by research subjects in order to qualify for participation in the study (Sani et al., 2018). In this study, the inclusion criteria established include :

1. Elderly people aged 60 and above.
2. Sufferers of hypertension or pre-hypertension (systolic 120-139 diastolic 80-89 mmHg), grade 1 (systolic 140-159 diastolic 90-99 mmHg), and grade 2 (systolic >160 diastolic >100 mmHg) who reside in RT 03 RW 01 Sekarpuro Village Pakis District Malang Regency.
3. Respondents must be able to communicate well in Indonesian or Javanese.
4. Cooperative and without physical impairments.
5. Willing to be respondents and follow the DASH diet for 2 weeks.
6. Patients who have been diagnosed with hypertension by health workers or patients who are aware that they have hypertension.

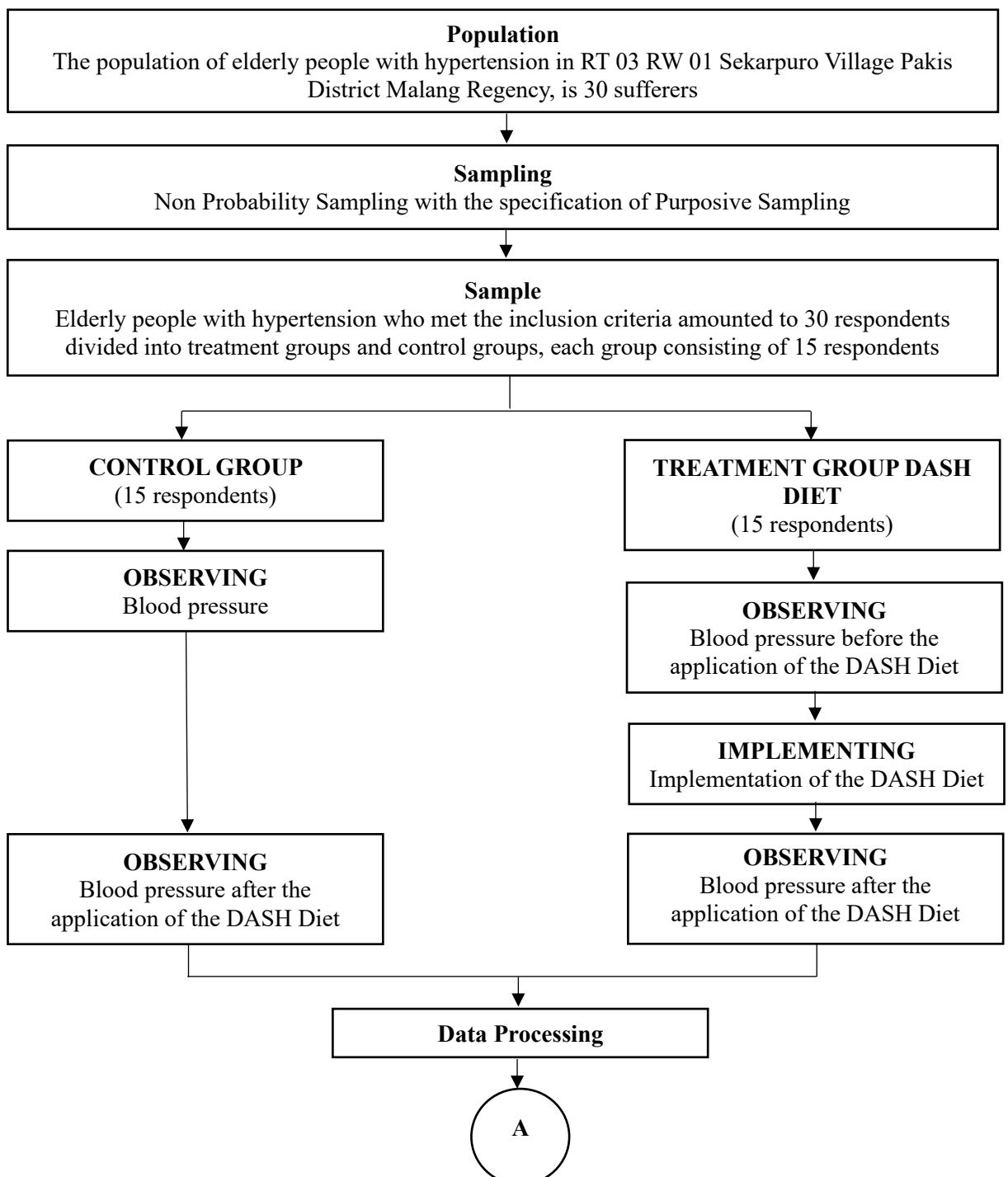
3.2.5 Exclusion Criteria

Exclusion criteria refer to specific conditions or characteristics possessed by subjects, even if they may meet the inclusion criteria, but cannot be included in the study (Sani et al., 2018). The exclusion criteria in this study include :

1. Patients with other complicating diseases such as heart problems, kidney issues, or diabetes mellitus.
2. Having digestive disorders, allergies, hearing impairments, vision impairments, mental disorders, or tactile disorders that could interfere with the implementation of the intervention.
3. Elderly people who do not live with family or live alone.

3.3 Framework

To ensure the research runs smoothly and the data is accumulated well, the researcher prepares a framework (Siyoto & Sodik, 2015). This research framework describes the procedures that will be applied during the research process (Rozana & Bantali, 2020). The following is the framework applied in this study.



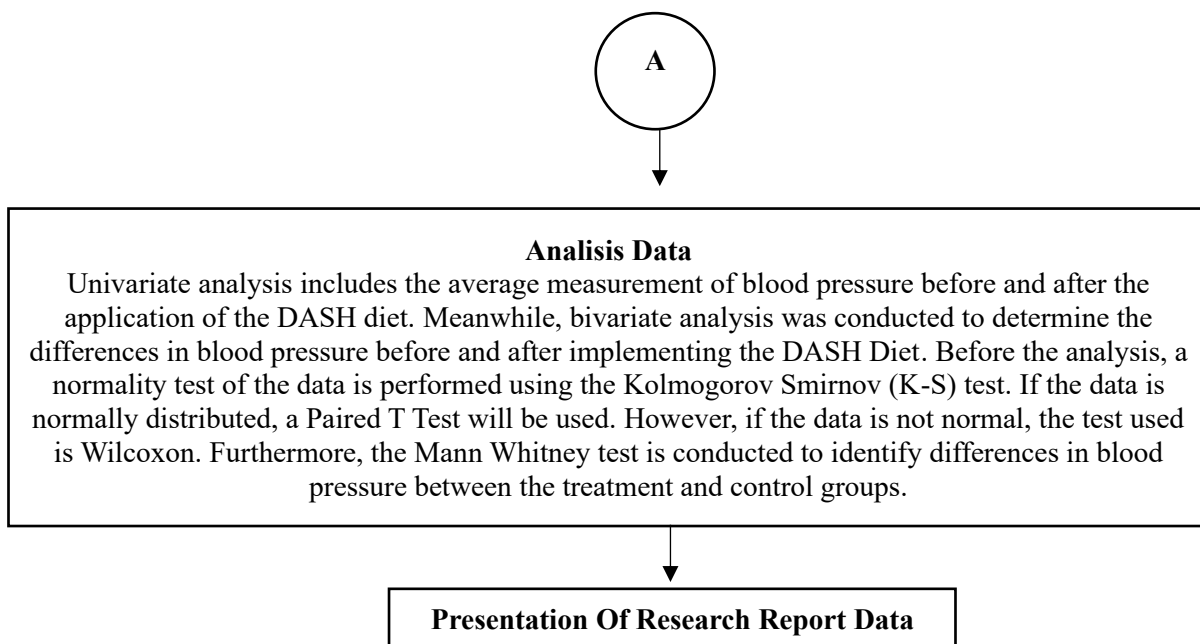


Figure 3. 2 Research Framework

3.4 Research Variables

Research variables refer to the things chosen by the researcher to be studied, which aim to obtain information and draw conclusions. Variables are very crucial in research because they will determine the direction and focus of the research (Sugiyono, 2013). In this study, variables are divided into two types, namely independent variables and dependent variables.

3.4.1 Independent Variable

The independent variable is a variable that has an influence or determines the value of other variables. This variable functions as a stimulus provided by the researcher in observing its impact on the dependent variable (Nursalam, 2017). In this study, the independent variable was the implementation of the DASH diet.

3.4.2 Dependent Variable

The dependent variable is a variable whose value is influenced by other variables. This variable will appear as a result of manipulation of other variables (Nursalam, 2017). In this study, the dependent variable is blood pressure changes.

3.5 Operational Definition

Operational definition is a guideline that explains how to measure variables in research, including criteria and data scales applied to define the variables being studied (Nurdin & Hartati, 2019). This includes the measurement procedures applied to identify research variables, as well as the assessment criteria and data scales applied in the measurement (Siyoto & Sodik, 2015). An explanation of the operational definition of each variable can be found in Table 3. 8.

Table 3. 8 Operational Definition Of The Application Of The DASH Diet On Blood Pressure Changes In Elderly

No	Research Variables	Definition	Parameter	Instrument	Scale	Score
1.	Independent Variable Implementation of DASH Diet	The DASH diet is a diet designed to help hypertension patients by reducing salt intake and increasing intake of vegetables, high-fiber fruits, low-fat milk, nuts, and meat. This diet is applied for 2 weeks in everyday life. To measure the implementation of the DASH diet, a food recall method is applied for 2x24 hours which will be filled in by researchers along with the implementation of mentoring twice a week.	As per the DASH Diet guidelines	- DASH Diet Implementation Guide Sheet - 2x24 hour recall form - Nutrisurvey application	-	- Good : If it meets > 60-100% of recommendations - Sufficient : If it meets 40-60% of recommendations - Less : If it meets < 40% of recommendations
2.	Dependent Variable Blood Pressure Changes	Blood pressure changes refer to the difference in systolic (top number) and diastolic (bottom number) numbers measured using a digital sphygmomanometer. This measurement compares the average blood pressure values before and after undergoing the DASH diet. Blood pressure measurements were carried	There is a difference in systolic and diastolic blood pressure values	- Digital tensiometer - Blood Pressure Measurement Observation Sheet	Ratio	- Pre-Hypertension : systolic 120-139 diastolic 80-89 mmHg - Grade 1 Hypertension : systolic 140-159

out once before and after the diet which was carried out for 2 weeks.

diastolic 90-99
mmHg
- Grade 2
Hypertension :
systolic >160
diastolic >100
mmHg

3.6 Location And Time Of Research

3.6.1 Research Location

Hardani (2020) explains that the selection of the location is carried out because it aligns with the focus of the research, has uniqueness, and is interesting to obtain data or information comprehensively (Hardani et al., 2020). This research was conducted in RT 03 RW 01 Sekarpuro Village Pakis District Malang Regency.

3.6.2 Research Time

Data collection in this study was carried out on May 5-19, 2025.

3.7 Data Collection Method

This study applies primary data obtained directly by researchers from the research targets. The primary data accumulated include blood pressure examination data before and after the intervention, respondent characteristic data, and DASH diet intake data.

a. Blood pressure examination data before and after the intervention

Blood pressure data were obtained by applying an accurate digital tensiometer in measuring blood pressure in mmHg units. Measurements were carried out before and after the implementation of the DASH diet, with the results recorded on the available observation sheet. Blood pressure measurements were carried out once before the DASH diet intervention and once after the intervention for two weeks.

b. Respondent characteristic data

Data on respondent characteristics include information including age, gender, education level, occupation, history of hypertension, history of

medicine use, smoking habits, alcohol consumption, caffeine consumption habits, and allergies or food restrictions. This information was obtained through direct interviews to fill out the questionnaire form.

c. DASH diet intake data

Data on DASH diet food intake were accumulated through direct interviews and filling out questionnaires using the 2x24 hour food recall method. The recall was conducted over two consecutive days with a one-day break in between, to ensure a greater variety of foods.

From Sirajuddin et al. (2018), the 24-hour food recall method is a way to remember and record food that has been consumed in the last 24 hours, which is measured using household units of measurement (URT) (Sirajuddin et al., 2018). The data obtained from this 24-hour recall are then calculated to determine the nutritional adequacy and iron content consumed in the 2x24 hours. The second interview was conducted one day after the first interview to ensure different food variations. Based on this explanation, the researcher will conduct two interviews each week using the 24-hour food recall method.

Below are the steps taken in the 24-hour food recall interview :

- 1) Greet the respondent, introduce yourself and explain the purpose of the following data collection.
- 2) Provide an explanation of informed consent to obtain approval for participation.

- 3) Ask about food and drinks consumed during the last 24 hours, including snacks and supplements, and the household size (URT) of each consumption.
- 4) To help respondents remember, provide an explanation of the time of food consumption.
- 5) Reread the list of foods and drinks that have been recorded to ensure nothing is missed.
- 6) After the recall is complete, convert the food ingredients recorded in the URT into food weight in grams by applying the conversion of exchange ingredients with the help of the Nutrisurvey application.

3.8 Research Instruments

After selecting the appropriate research method, the researcher can begin to compile the instruments that will be applied. Before being used for data collection, these instruments need to be tested to ensure their validity and reliability. Research instruments can take the form of questionnaires, tests, or interview/observation guidelines (Sugiyono, 2014). In this study, data collection instruments were implemented by applying :

1. Questionnaire Sheet

A questionnaire is a tool used to collect data through a series of prepared questions. In this study, the questionnaire was used to obtain demographic data (including age, gender, education, occupation, and marital status) and information related to hypertension.

2. Interview

Interviews are a data collection method that involves direct interaction between researchers and participants. In this study, interviews were conducted to dig deeper into the characteristics of respondents and to collect data related to 24-hour food recalls. Interviews were conducted in a semi-structured manner, where researchers prepared a list of main questions but could also add other questions based on the answers given by participants, in order to obtain more in-depth information.

In the implementation of this study, other supporting tools outside the instrument were also used to guide the research process. Among them are :

1. Digital Sphygmomanometer

A digital sphygmomanometer is a tool that makes it easier to measure blood pressure automatically, faster, and more accurately than a manual sphygmomanometer. This tool is applied in the study to measure systolic and diastolic blood pressure in the elderly, both before and after the DASH diet intervention. With a digital sphygmomanometer, reading the results becomes easier, human error can be minimized, and the measurement results can be stored for further analysis.

2. Observation Sheet

The observation sheet is applied to record and monitor participant behavior during the study. In the following study, the observation sheet functions to record the extent to which the elderly follow the DASH diet through a 24-hour food recall, including the types of food consumed and their frequency. Some of the items recorded are the number of servings of vegetables, fruits, low-fat dairy products,

and other eating habits. In addition, the observation sheet is also applied to record the results of blood pressure measurements before and after the intervention and the level of compliance or level of consumption of respondents to the DASH diet during the three-day mentoring.

3. Guideline Sheet

The guideline sheet contains detailed instructions on how to implement the DASH diet. In this study, the guide was presented in the form of a leaflet to help participants follow the DASH diet properly, including guidance on recommended food portions and types of food.

3.9 Steps Of The Research

Below are the steps for collecting data in this study :

1. Preparation Stage

- a. The researcher takes care of the research permit letter from the institution addressed to RT 03 RW 01 Sekarpuro Village Pakis District Malang Regency.
- b. Conducting a preliminary study to understand more deeply about the research to be carried out.
- c. Compiling a research proposal, conducting a proposal seminar, and carrying out revisions based on the results of the seminar.
- d. Submitting research ethics approval (ethical clearance) to Health Polytechnic Ministry of Health Malang.

2. Implementation Stage

- a. Determining the population that is the subject of the study, then selecting a sample in line with the inclusion and exclusion criteria.
 - b. Providing an explanation to prospective respondents regarding the objectives, benefits, risks, data confidentiality, and advantages and disadvantages of the following research.
 - c. Asking prospective respondents to agree to their participation in the study by signing an informed consent, without any coercion if they refuse.
 - d. Determining a time agreement with respondents for the implementation of the study.
3. Data Collection Stage
- a. Researchers provide education about the DASH diet to respondents.
 - b. Researchers conduct interviews to collect demographic data and information about hypertension.
 - c. Pretest: Blood pressure measurements are carried out on both groups of respondents before the intervention.
 - d. Researchers confirm the respondents commitment to follow the DASH diet intervention three times a day (morning, afternoon, evening) for two weeks, in line with the DASH diet guidelines, and researchers provide assistance twice a week to fill out a 24-hour food recall.
 - e. Posttest: Blood pressure measurements are carried out again after two weeks of DASH diet intervention in both groups.

- f. Researchers provide additional education about the DASH diet, especially in the control group.
- g. After the two-week intervention, the pretest and posttest blood pressure results from both groups (treatment and control) are compared.
- h. Researchers record findings from blood pressure measurements, all foods and drinks consumed by respondents, including snacks, by applying household measurements (URT) on the observation sheet that has been prepared.

3.10 Data Processing Techniques

Data processing is basically a process in analyzing and summarizing raw data into useful information by applying certain formulas. After implementing the DASH diet, researchers will process the data that has been obtained. Some steps taken in this data processing (Hulu & Sinaga, 2019), include :

1. Editing (Checking and Editing)

Editing is the process of checking and correcting the contents of the form or questionnaire that has been filled out (Notoatmodjo, 2010). After the data is accumulated, the researcher must check and edit the data obtained to ensure the completeness and consistency of the respondents answers. This stage is important to ensure that the accumulated data is accurate and complete. After all the data is accumulated, the researcher will edit the results of filling out the questionnaire and blood pressure measurements (pre and post) recorded in the observation sheet, then enter the data into the SPSS application for analysis.

2. Coding (Giving Code Marks)

After all the questionnaires have been checked and edited, the next step is the coding process, namely changing data in the form of sentences or letters to numbers or figures (Notoatmodjo, 2010). After editing is complete, each answer in the questionnaire is coded by classifying information including gender, last level of education, and respondent's occupation into numbers. Each answer is then given a number code in line with the predetermined classification.

For demographic data, gender is coded "1" for male and "2" for female. As for the last level of education, it is coded "1" for no school, "2" for elementary school, "3" for junior high school, "4" for high school, and "5" for college. For work, it is coded "1" if not working and "2" if working. In the research group, code "1" is given for the treatment group, while code "2" is given for the control group.

3. Processing/Entry (Data Entry)

Data obtained from respondents, which are already in the form of codes in the form of numbers or letters, are entered into a computer program (Notoatmodjo, 2010). The results of blood pressure measurements before the implementation of the DASH diet (pre-test) and after the implementation of the DASH diet (post-test) are then entered into the SPSS program for further analysis.

4. Cleaning (Data Cleaning)

Data cleaning is a step in checking each data that has been entered, to ensure there are no code errors, deficiencies, or other problems (Notoatmodjo,

2010). This process is carried out to check and correct the data that has been entered, so that all data applied in the analysis is correct and complete.

3.11 Data Analysis

Data analysis is a step to process the accumulated data in a structured manner, so that the results can be clearly understood. The accumulated data will be analyzed systematically and then presented in the form of tables and graphs to facilitate understanding (Hulu & Sinaga, 2019).

After the data is accumulated, the next step is to analyze it systematically and present it in the form of a table. Then, a hypothesis test was conducted to measure the difference in blood pressure before and after implementing the Dietary Approaches To Stop Hypertension (DASH) diet in elderly people with hypertension in RT 03 RW 01 Sekarpuro Village Pakis District Malang Regency.

3.11.1 Univariate Analysis

Univariate analysis is intended to describe or illustrate the characteristics of each research variable. This type of analysis depends on the type of data applied (Notoatmodjo, 2010). In this study, univariate analysis was applied to the respondent characteristic variables and the dependent variable, namely the blood pressure of the elderly with hypertension for the group receiving the DASH diet treatment, both before and after the intervention. Univariate analysis was applied to describe demographic characteristics, including gender, history of hypertension, age, and blood pressure examination results.

The numerical data applied in this study were blood pressure before and after the DASH diet intervention, which was measured once for two weeks. This

data was calculated as an average (mean) and presented in the form of tables and graphs to compare changes in blood pressure between before and after the implementation of the DASH diet.

3.11.2 Bivariate Analysis

Bivariate analysis is applied in analyzing the relationship between two variables. This analysis is intended to see whether there is an influence or relationship between the independent variable and the dependent variable (Notoatmodjo, 2010). In this study, bivariate analysis was applied to see the differences in blood pressure before and after implementing the DASH diet in elderly people with hypertension.

This data analysis applies a comparative test to evaluate the effectiveness of implementing the DASH diet. The first step is to test the normality of the data by applying the Kolmogorov-Smirnov (K-S) test. If the data is normally distributed, the researcher will apply the Paired T-Test to compare the differences between the pre and post values for the treatment group. However, if the data is not normally distributed, the test applied is the Wilcoxon test. Furthermore, the Mann-Whitney test will be applied to compare the differences in blood pressure between the treatment group and the control group.

The statistical test in this study was carried out using SPSS for Windows software. After that, the data will be analyzed and get a p-value. If the p-value obtained $< \alpha$ (0.05) or smaller than α (0.05), then H_0 is rejected and H_1 is accepted, which indicates that the implementation of the DASH diet has an effect on changes in blood pressure in hypertensive elderly. Conversely, if the p-value $> \alpha$ (0.05) or

greater than α (0.05), then H_0 is accepted and H_1 is rejected, which means there is no effect of the implementation of the DASH diet on changes in blood pressure in hypertensive elderly.

3.12 Data Presentation

In order for the analysis results to be easily understood, statistical data needs to be presented in a clear and readable manner (Setiadi, 2013). Research findings are displayed in the form of tables and diagrams, which include information about gender, family history, age, as well as details regarding hypertension, sources of information about hypertension, blood pressure examinations, medications consumed, and frequently eaten foods. In addition, data on blood pressure changes are presented in the form of line graphs or line diagrams to facilitate the interpretation of results. Explanations are also provided in the form of detailed narratives to complement and explain the data that has been classified and tabulated.

3.13 Research Ethics

Any research involving human subjects must comply with ethical principles, including obtaining valid permission. In this research, the ethics applied include consent from participants, anonymity, and maintaining the confidentiality of their data (Setiadi, 2013).

Before collecting data, researchers approach by introducing themselves and explaining who they are and the purpose of the research to selected respondents. In order to avoid ethical problems, researchers pay special attention to the ethical aspects in the following research (Setiadi, 2013). Some of the things that are considered include :

3.13.1 Basic Principles And Ethical Guidelines Of Research

1. Aspect of respecting human dignity (respect for human dignity)

In this study, researchers respect the dignity of each individual and give subjects the freedom to choose whether they want to participate or not. The researcher also prepares a consent form that explains the rights of the subjects and the applicable provisions in the research.

2. Aspect of respecting the privacy and confidentiality of research subjects (respect for privacy and confidentiality)

Researchers are committed to maintaining the privacy of respondents as subjects of the research. The identities of respondents are replaced with codes, and researchers ensure that the accumulated data will be kept confidential and deleted after the research is completed.

3. Aspects of justice and openness (respect for justice and inclusiveness)

Researchers conduct the research honestly and carefully, following the principles of openness and honesty. Researchers explain the purpose and procedures of the research to respondents and also strive to ensure that all subjects are treated fairly.

4. Considering the benefits and harms caused (balancing harms and benefits)

Research is only conducted with the consent of respondents, considering the possibility that the research may cause discomfort. Respondents have the right to feel safe and protected from potential harms that may arise during the research.

3.13.2 Health Research Ethics

1. Rights and obligations of Respondents

- The rights of respondents, include :
 - a) The right to maintain their privacy.
 - b) The right to keep the information provided confidential.
 - c) The right to have their security guaranteed regarding the information provided.
 - d) The right to receive rewards or compensation.
- The obligation of respondents is that respondents are required to provide the information needed by researchers after agreeing to informed consent.

2. Rights and obligations of Researcher

- The rights of researchers are that, after respondents agree to provide information through informed consent, researchers have the right to receive the information needed honestly and completely from respondents. If respondents are hesitant or do not provide information, researchers must remind them about informed consent.
- The obligations of researchers, include :
 - a) Maintaining the privacy of respondents.
 - b) Maintaining the confidentiality of respondent data.
 - c) Providing compensation to respondents in accordance with applicable regulations.