CHAPTER 1

INTRODUCTION

1.1 Background

Hypertension is the leading cause of cardiovascular disease and premature death worldwide. As a result of with the widespread use of antihypertensive drugs, global mean blood pressure (BP) has remained constant or decreased slightly over the last four decades (Katherine T Mills, 2020). Hypertension is one of the public health problems that suffers throughout the world, including Indonesia. Hypertension is an increase in systolic and diastolic blood pressure due to heart and blood vessel disorders that last for a long time. Hypertension is often referred to as the silent killer because patients cannot feel the symptoms of hypertension. Hypertension is the third leading cause of death after stroke and tuberculosis, accounting for 6.8% of the proportion of causes of death at all ages in Indonesia (Malope, 2012). Hypertension is often defined as a condition where the systolic blood pressure is more than 120 mmHg and the diastolic pressure is more than 80 mmHg (Ardiansyah, 2012).

Several factors can cause hypertension such as genetic factors, activity patterns, obesity, age, and diet. In international, the superiority of overweight and obesity continuously growing and has became a worldwide pandemic. In the United States, the 2011–2012 National Health and Nutrition Examination Survey displayed that approximately 16.9% of youth and 34.9% of adults were diagnosed with obesity. In China, from 1980 to 2013, the combined age-standardized prevalence of overweight and obesity

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in men and women over the age of 20 was 28.3% and 27.4%, respectively. Several studies have reported that there is a link between blood pressure increase and weight gain. Data from NHANES confirmed that the superiority of hypertension in obese people is significantly higher than that in the general population. A prospective analysis also showed that the high prevalence of hypertension in obese patients (>60%) account for 78% of incident of hypertension in men and 64% in women. Although the category system of weight problem is not exactly identical, body mass index(BMI) is the most commonly used measure, dividing obesity into overweight and various grades. BMI was defined as the ratio of body weight (kilograms) to the square of height (meters).were respectively defined as underweight, normal, obese and overweight (Yangming Qu, 2019).

According to WHO statistics, global approximately 972 million humans or 26.4% of humans global be afflicted by high blood pressure, this parent is probable to boom to 29.2% in 2025. Of the 972 million humans with high blood pressure, 333 million are in advanced nations and The ultimate 639 are in growing nations, inclusive of Indonesia (Yonata, 2016). Hypertension continues to be a chief fitness trouble in each advanced and growing nations. WHO (2015) suggests that round 1.thirteen billion humans withinside the international be afflicted by high blood pressure. This approach that 1 in three humans withinside the international are identified with high blood pressure, best 36.8% of them are taking medication. Riskesdas statistics in 2018 suggests the superiority of high blood pressure in Indonesia is 34.1%. This suggests an boom from 2013 which became

25.8%. Based on age organization, the superiority of high blood pressure withinside the 25-34 yr organization became 14, 7% at the same time as the 35-forty four yr age organization is 24.8% (Ministry of Health, 2018). In the effects of the 2013 Riskesdas, the superiority of high blood pressure reduced via way of means of 26.5%. In East Java province, primarily based totally at the effects of the 2013 East Java Riskesdas, the superiority of high blood pressure reached 26.2%. As many as 6-15% of high blood pressure happens in adults, 50% of adults aren't aware about being high blood pressure patients in order that they generally tend to end up extreme high blood pressure due to the fact they do now no longer keep away from and realize the hazard factors, and 90% are vital high blood pressure. Folowing to the Banyuwangi Health Office, in 2020 there were 17.250 hypertension sufferers in Banyuwangi Regency and the Klatak Publik Health Center was included in top 5 health centers with a high incidence of hypertension with total number of hypertension sufferers as many as 534 according to Klatak Health Center data from January to November 2021.

Hypertension is not only caused by dietary factors, obesity and low physical activity can also affect it. Epidemiological studies have shown that the risk of developing hypertension is higher in people who are obese. Measurement of obesity can be done using body mass index (BMI), for Asian people BMI is categorized as obese if > 25 kg/m2. The use of BMI only applies to adults over the age of 18. Body Mass Index (BMI) cannot be applied to infants, children, adolescents, pregnant women, and athletes (Stefanes, 2012).

One of the things that can affect a person's body mass index (BMI) increases is a pattern of eating that contains too much fat and high sugar in fast food. Body mass index is an indicator used to determine the degree of nutritional status, the greater the body weight, the greater the BMI result. When you gain weight, the volume of blood will increase so that the workload of the heart to pump blood also increases. The link between obesity and hypertension is complex, considering that obesity-related hypertension is closely associated with other diseases in the course of the obesity. In general, obesity, which is usually determined by Body Mass Index (BMI), is one the principal risk factors for hypertension and the prevalence of hypertension increases with rising Body Mass Index (BMI) (Abrammowittz, 2014).

Hypertension in adults can occur due to historical risk factors hypertension in the family, lifestyle changes such as excessive salt consumption height, active activity, social stress and being overweight or obese (Juonala et al., 2015). The relationship between increased blood pressure and being overweight body weight in adults is an increase in free fatty acids, an increase in insulin, increased leptin, aldosterone & increased renin activity Angiotensin will stimulate an increase in sympathetic nervous system activity Increased sympathetic nervous system, leptin, aldosterone, Renin System activity Angiotensin (RAS) will then cause insulin and sodium retention which in turn will result in an increase in blood pressure. other than that increased aldosterin & renin-angiotensin activity, and increased Endothelin − 1 and decreased activity of nitric oxide (NO) will

result in vasoconstriction which will then predispose to an increase in blood pressure (Fachrana, 2017). Blood pressure in adults can be determined by measuring body mass index (BMI). Body Mass Index (BMI) is the ratio of weight (in kilograms) using the square of height (in meters) (Verma, 2016).

Various efforts such as preventive, promotive, curative and rehabilitative have been carried out by health service workers at health centers and hospitals to suppress cases of hypertension in Indonesia. Preventive activities that often carry out early detection of risk factors for hypertension include measuring Body Mass Index (BMI), hypertension surveillance and regular health checks. After preventive action, promotive activities can be carried out such as conducting counseling related to hypertension. If there are findings related to patients with hypertension, then curative and rehabilitative measures are carried out. Based on the data and description of the background above, the researcher is interested in researching the Correlation Between Body Mass Index (BMI) and the Incidence of Hypertension in Adults at Working Area of Klatak Public Health Centers in 2022.

1.2 Problem Formulation

Is There The Correlation Between Body Mass Index (BMI) and The Incidence Of Hypertension In Adults At Working Area Of Klatak Public Health Centers Banyuwangi In 2022.

1.3 The Objective of Study

1.3.1. General Aim

Knowing the Correlation Between Body Mass Index (BMI) and the Incidence of Hypertension in Adults At Working Area of Klatak Public Health Centers in 2022.

1.3.2. Specific aim

1. Identifying Body Mass Index (BMI) in Adults at Working Area of Klatak Public Health Center in 2022

2. Identifying Blood Pressure in Adults at Working Area of Klatak Public Health Center in 2022

3. Analyzing the Correlation Between Body Mass Index (BMI) and the Incidence of Hypertension in Adults At Working Area of Public Health Centers in 2022

1.4 Expected Result

1.4.1 Theoretical

The results of this study are expected to develop scientific insight regarding the Correlation Between Body Mass Index (BMI) and the Incidence of Hypertension in Adults at Working Area of Klatak Public Health Centers in 2022.

1.4.2 Practical

1. For the nursing profession

It is hoped that this research will provide input for the nursing profession in developing nursing care that will be carried out on the Correlation Between Body Mass Index (BMI) and the Incidence of Hypertension in Adults at Working Area of Klatak Public Health Centers in 2022.

2. For future researchers

The results of this study are expected to provide information or input from researchers, especially for nursing science about the Correlation Between Body Mass Index (BMI) and the Incidence of Hypertension in Adults at Working Area of Klatak Public Health Centers in 2022.

3. For respondents

The results of this study are expected to provide additional insight and additional knowledge regarding the relationship between the Correlation Between Body Mass Index (BMI) and the Incidence of Hypertension in Adults at Working Area of Klatak Public Health Centers in 2022.

4. Benefits for the research site

The results of this study are expected to be used as information as a reference source for institutions to add knowledge related to research on the Correlation Between Body Mass Index

(BMI) and the Incidence of Hypertension in Adults at Working Area of Klatak Public Health Centers in 2022. and become a collection of research results and can be placed in the institutional library as a guide to obtain more information.

CHAPTER 2

LITERATURE REVIEW

2.1 Adult Concept

2.1.1 Definition

Understanding Early Adult Age Etymologically, the term adult (adult) comes from the Latin, past participle form of the verb adultus which means "grown to full size and strength" (matured)". In Dutch, adult is defined as "volwas'sen" was'sen means to grow, so volwasen h, finished growing or growing up". With this understanding, adults are individuals who have completed their growth and are ready to accept a new position in society.

2.1.2 Age Classification

If psychology does age classification based on stages of mental development, then health science divides it based on physical condition. Al Amin (2017) wrote that the age classification according to the Ministry of Health is as follows:

1) Toddler Age: 0–5 Years

2) Childhood: 5–11 Years

3) Early Adolescence: 12–16 Years

4) Late Adolescence: 17–25 Years

5) Early Adulthood: 26–35 Years

6) Late Adulthood: 36–45 Years

7) Early Old Age: 46–55 Years

8) Late Old Age: 56–65 Years

9) Old Age: > 65 Years.

The age classification according to WHO it self is as follows:

1) Infants (infants): 0-1 years

2) Children (children): 2-10 years

3) Adolescents: 11-19 years old

4) Adult (adult): 20-60 years old

5) Elderly: above 60 years old

2.1.3 Characteristics of Adult Humans

According to Dr. Harold Shyrock from the United States, there are five factors that can indicate maturity, namely:

1. Physical struggle

2. Mental ability

3. Social growth

4. Emotional

5. Spiritual and moral growth

2.1.4 Adult Developmental Tasks

By the end of adolescence, almost all aspects of an individual's life have developed and are ready to carry out tasks as adults

a) In early adulthood, the developmental tasks that individuals must complete are:

1. Choose a life partner

2. Learn to live with a life partner

3. Starting family life

4. Maintain and educate children

5. Managing the household

6. Start work activities

7. Be responsible as a citizen and citizen

8. Find friendship in social groups

b) Developmental tasks in middle adulthood are:

1. Have social and state responsibilities as adults

2. Develop and maintain an economic standard of living

3. Guiding children and youth to become responsible and happy adults

4. Develop leisure activities as an adult, relationships with other family partners as a person

5. Accept and adjust to physical changes as a middle-aged person

6. Adjusting to life as an aging parent

c) Developmental tasks in the elderly are:

1. Adjusting to declining physical and health conditions

2. Adjusting to the situation of retirement and diminishing income

3. Adjusting to the death of a spouse

4. Building relationships with fellow seniors

5. Fulfilling social and state obligations

6. Maintain condition and health

7. Readiness to face death

2.2 Hypertension Concept

2.2.1   Definition of Hypertension

Definition of hypertension according to several sources:

Both endogenous such as age, gender and genetics/heredity, as well as exogenous ones such as obesity, salt consumption, cigarettes and coffee. According to the American Heart Association or AHA in the Ministry of Health (2018), hypertension is a silent killer where the symptoms vary widely in each individual and are almost the same as other diseases. These symptoms are headaches or heaviness in the neck. Vertigo, palpitations, fatigue, blurred vision, ringing in the ears or tinnitus and nosebleeds. Hypertension is a silent killer where the symptoms vary greatly in each individual and are almost the same as other diseases. These symptoms are headaches or heaviness in the neck. Vertigo, palpitations, fatigue, blurred vision, ringing in the ears or tinnitus and nosebleeds. Hypertension is a silent killer where the symptoms vary in each individual and are almost the same as other diseases. These symptoms are headaches or heaviness in the neck. Vertigo, palpitations, fatigue, blurred vision, ringing in the ears or tinnitus and nosebleeds.

Based on several definitions according to the experts above, it can be concluded that hypertension is an increase in systolic blood pressure above the normal limit of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg that occurs continuously over a long period and

hypertension is usually accompanied by various kinds of symptoms such as headache or heaviness in the neck, vertigo, heart palpitations, fatigue, blurred vision etc.

2.2.2 Etiology of Hypertension

According to Smeltzer (2013), based on the cause of its occurrence, hypertension is divided into two parts, namely:

a. Primary (Essential) Hypertension

This type of primary hypertension often occurs in the adult population between 90% - 95%. Primary hypertension has no identifiable clinical cause, and it is also possible that this condition is multifactorial (Smeltzer, 2013; Lewis, Dirksen, Heitkemper, & Bucher, 2014). Primary hypertension cannot be cured, but can be controlled with appropriate therapy. In this regard, genetic factors may play an important role in the development of primary hypertension and a form of high blood pressure that tends to develop gradually over years (Bell, Twiggs, & Olin, 2015).

b. Secondary Hypertension

Secondary hypertension is characterized by increased blood pressure and is accompanied by specific causes, such as narrowing of the renal arteries, pregnancy, certain medications, and other causes. Secondary hypertension can also be acute, indicating a change in cardiac output (Ignatavicius, Workman, & Rebar, 2017).

2.2.3 Classification of hypertension

According to the World Health Organization (Noorhidayah, SA 2016) the classification of hypertension is:

a) Normal blood pressure is when the systolic is less or equal to 140 mmHg and the diastolic is less or equal to 90 mmHg.

b) Border line blood pressure is when the systolic is 141-149 mmHg and the diastolic is 91-94 mmHg.

c) High blood pressure (hypertension) is when the systolic is greater than or equal to 160 mmHg and the diastolic is greater than or equal to 95 mmHg.

According to the Join National Committee on Detection Evolution and Treatment of High Blood Pressure VIII in Bell et al, (2015) classifies blood pressure in adults aged 18 years or over as follows

Table 2.1 Classification of Hypertension according to Bell, Twiggs and Oline (2015)

Classification	Systolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)
Normal	<120	<80
Prehypertension	120-139	80-89
Stage 1 Hypertension	140-159	90-99
Stage 2 Hypertension	160	100

According to Tambayong (in Nurarif AH, & Kusuma H. 2016), the classification of clinical hypertension based on systolic and diastolic blood pressure is:

Table 2.2 Classification of clinical hypertension

Classification	Systolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)
Optimal	<120	<80
Normal	120-129	80-84
High Normal	130-139	85-89
Grade 1 (light)	140-159	90-99
Grade 2 (medium)	160-179	100-109
Grade 3 (weight)	180-209	100-119
Grade 4 (very heavy)	210	120

2.1.1 Risk factors for hypertension

Several risk factors for hypertension according to (Musakkar & Djafar, 2021), include:

1) Descendants

If someone has a parent or sibling who suffers from hypertension, it is likely that that person has hypertension.

2) Age

A study shows that the older a person gets, the blood pressure will increase.

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5) Salt

Salt can increase blood pressure quickly in some people.

6) Cholesterol

Excess fat content in the blood can cause cholesterol deposits on the walls of blood vessels, resulting in narrowed blood vessels and blood pressure will increase.

7) Obesity/overweight

People who have 30% of ideal body weight have a higher risk of developing hypertension.

8) Stress

Stress is a problem that triggers hypertension where the relationship between stress and hypertension is thought to be through sympathetic nerve activity, increasing nerves can increase blood pressure intermittently (uncertainly) (Anggriani et al., 2014).

9) Cigarette

Smoking can trigger high blood pressure, if you smoke in a state of suffering from hypertension it will be able to trigger diseases related to the heart and blood.

10) Caffeine

Caffeine found in coffee, tea, or soft drinks can increase blood pressure.

11) Alcohol

Excessive alcohol consumption can increase blood pressure.

12) Lack of exercise

Lack of exercise and movement can increase blood pressure, if you suffer from hypertension so as not to do strenuous exercise.

2.1.2   Pathophysiology

Systemic arterial blood pressure is the product of the total resistance/peripheral resistance with cardiac output (cardiac output). Cardiac Output results are obtained by multiplying the stroke volume (the volume of blood pumped from the ventricles of the heart) with the heart rate (heart rate). The autonomic system and hormonal circulation function to maintain the regulation of peripheral resistance. Hypertension is an abnormality of these two factors which is characterized by an increase in cardiac output and an increase in peripheral resistance (Kowalak, 2011; Ardiansyah, 2012).

Various theories that explain the occurrence of hypertension, these theories include (Kowalak, 2011):

a) Changes that occur in the cushioning of the arterial walls resulting in increased peripheral retention.

b) There is an abnormal increase in sympathetic nervous system tone originating in the vasomotor center, which can result in increased peripheral retention.

c) Increased blood volume caused by renal or hormonal dysfunction.

d) Increased thickening of arteriolar walls due to genetic factors caused by peripheral vascular retention.

e) Abnormal release of renin to form angiotensin II, which constricts arterioles and increases blood volume.

Continuously increasing blood pressure in hypertensive patients can cause the heart's workload to increase. This occurs because of increased resistance to left ventricular ejection. In order for the strength of heart contraction to increase, the left ventricle hypertrophies so that the oxygen demand and the workload of the heart also increases. Cardiac dilatation and failure may occur, if hypertrophy cannot maintain adequate cardiac output. Because hypertension triggers coronary artery atherosclerosis, the heart can experience further disruption due to decreased blood flow to the myocardium, resulting in angina pectoris or myocardial infarction.

Hypertension also causes damage to blood vessels which further accelerates the process of atherosclerosis and damage to vital organs

such as stroke, kidney failure, aneurysm and retinal injury (Kowalak, 2011). The work of the heart is mainly determined by the amount of cardiac output and peripheral resistance. Generally, cardiac output in hypertensive patients is normal. The presence of abnormalities, especially in the elevation of peripheral resistance. Increased peripheral resistance is caused by arteriolar vasoconstriction due to increased smooth muscle tone in these blood vessels. If hypertension has been experienced for a long time, what will often be found is structural changes in arteriolar blood vessels such as thickening of the tunica internal and hypertrophy of the tunica media. With hypertrophy and hyperplasia, the blood circulation in the heart muscle is no longer sufficient, resulting in relative anoxia. This can be clarified by the presence of coronary sclerosis (Riyadi, 2011).

2.1.3 Clinical Manifestations

Most people with hypertension do not show symptoms for years. Symptoms that most often appear in hypertensive patients if their hypertension has been untreated for years include headaches, fatigue, nausea, vomiting, shortness of breath, anxiety, blurred vision, and decreased consciousness (Nurarif, 2015).

In addition, hypertension has clinical signs that can occur, including (Smeltzer, 2013):

a) Physical examination can detect that there are no abnormalities other than high blood pressure.

b) Retinal changes with hemorrhage, exudate, arteriolar narrowing, and cotton-wool spots (small infarctions), and papilledema may be seen in patients with severe hypertension.

c) Symptoms usually indicate vascular damage that is interconnected with the organ system supplied by the affected blood vessels.

d) The impact that often occurs is coronary artery disease with angina or myocardial infarction.

e) Left ventricular hypertrophy occurs and then heart failure occurs.

f) Pathological changes can occur in the kidneys (nocturia, increased BUN, and creatinine levels).

g) A stroke or transient ischemic attack (TIA) occurs, namely changes that occur in vision or speech, dizziness, weakness, sudden falls or transient or permanent hemiplegia.

2.1.4 Hypertension Management

Management of hypertension is divided into two, namely management with pharmacological and non-pharmacological therapy.

a. Pharmacological therapy

Various clinical studies have shown that antihypertensive drugs given on time can reduce the incidence of stroke by 35-40%, myocardial infarction by 20-25%, and heart failure by more than 50%. Drugs given to people with hypertension include diuretics, angiotensin-converting enzyme (ACE), Beta-blockers, calcium channel blockers (CCBs), etc. Diuretics are

the first treatment for hypertension for most people with hypertension (Ministry of Health, 2013).

b. Non-pharmacological therapy

1) Eat balanced nutrition

Appropriate dietary management has been shown to reduce blood pressure in hypertensive patients. Diet management for people with hypertension is to limit sugar, salt, enough fruit, vegetables, low-fat foods, try to eat oily fish such as tuna, mackerel and salmon (Ministry of Health, 2013).

2) Lose weight

Hypertension is closely related to being overweight. Losing weight can lower blood pressure because it reduces the work of the heart and stroke volume (Aspiani, 2015). Hypertensive patients who are overweight (obese) are recommended to lose weight up to

Normal BMI is 18.5 – 22.9 kg/m2, waist circumference <90 cm for men and <80 cm for women (Ministry of Health, 2013).

3) Regular exercise

Regular exercise such as walking, running, swimming and cycling is beneficial for lowering blood pressure and improving heart performance (Aspiani, 2015). Aerobic exercise or brisk walking for 30-45 minutes five times per week can lower both systolic and diastolic blood pressure. In addition, various relaxation methods such as meditation and yoga are alternatives for people with hypertension without medication (Ministry of Health, 2013).

4) Quit smoking

Quitting smoking can reduce the long-term effects of hypertension because cigarette smoke which contains toxic chemicals such as nicotine and carbon monoxide inhaled through cigarettes can reduce blood flow to various organs and increase the work of the heart (Aspiani, 2015).

5) Reduce alcohol consumption

Reducing alcohol consumption can lower systolic blood pressure. So that people with hypertension are strived to avoid alcohol consumption (Ministry of Health, 2013).

6) Reduce stress

Stress can trigger a decrease in blood flow to the heart and increase the need for oxygen to various organs thereby increasing the performance of the heart, therefore by reducing stress a person can control their blood pressure (Nurahmani, 2012).

2.1.5   Complications of Hypertension

Complications Complications of hypertension based on target organs include the following (Irwan, 2016):

a. Cerebrovascular: stroke, transient ischemic attacks, vascular dementia, encephalopathy.

b. Eyes: hypertensive retinopathy

c. Cardiovascular: hypertensive heart disease, left ventricular dysfunction or hypertrophy, coronary heart disease, both systolic and diastolic dysfunction and ends in heart failure.

d. Kidney: hypertensive nephropathy, albuminuria, chronic kidney disease.

e. Peripheral arteries: intermittent claudication.

2.2 Body Mass Index (BMI) Concept

2.2.1 Definition of Body Mass Index (BMI)

According to some experts the definition of Body Mass Index (BMI), namely:

Body mass index (BMI) is a value taken from the calculation of the quotient between body weight (BB) in kilograms and the square of height (TB) in meters (Dhara & Chatterjee, 2015).

Body Mass Index is defined as a person's weight in kilograms divided by height in meters (kg/m2). The use of this formula can only be applied to people aged 18 to 70 years, with normal spinal structures, not athletes or bodybuilders, and not pregnant or lactating women (James, 2017).

Body Mass Index (BMI) is a parameter used to determine a person's weight status whether classified as normal or not (underweight, or overweight), the data needed to find BMI is data on the difference between weight and height. BMI can also be used to describe body composition roughly, although it is not accompanied by a value for the weight contribution of fat and muscle (Supariasa, 2012).

From the several definitions described above, it can be concluded that the Body Mass Index (BMI) is a parameter or measuring instrument that takes the value of the quotient between body weight (BB) in kilograms and the square of height (TB) which is used to determine weight status. someone to determine whether it is in the normal category or not.

2.2.2 BMI Components

a. Height

Height was measured by standing upright, without using footwear, both hands close to the body, back and buttocks against the wall and eyes directed forward. Both arms hanging relaxed at the side of the body. The movable measuring part is aligned with the top of the head (vertex) and should be reinforced against thick head hair. (Arisman, 2011).

b. Weight

Body weight was measured by standing on a weight scale (Arisman, 2011). The best time for weighing is in the morning when you wake up, before breakfast, after 10-12 hours of gastric emptying. Scales need to be calibrated at zero to start with and have an accuracy of 0.1kg. Body weight can be used as a reliable measure by combining and considering other parameters such as height, skeletal dimensions, proportion of fat, muscle, bone and pathological components of weight (such as edema and splenomegaly).

2.2.3 Factors Affecting Body Mass Index (BMI)

a. Age

Research conducted by Tungtrochitr and Lotrakul shows that there is a significant relationship between older age and obesity category BMI. Research subjects in the age group 40-49 and 50-59 years have a higher risk of obesity than the age group less than 40 years. This situation is suspected because of the slow metabolic process, reduced physical activity, and more frequent food consumption (Hidayati, 2017).

b. Dietary habit

Diet is a repetition of the arrangement of food that occurs when eating. Diet refers to the type, proportion and combination of food eaten by an individual, community or group of population. Fast food contributes to an increase in a person's Body Mass Index (BMI), this happens because of the high fat and sugar content in fast food. In addition to fast food, increasing portions and frequency of eating have an effect on increasing Body Mass Index (BMI). People who eat high-fat foods gain weight faster than people who eat high-carbohydrate foods with the same number of calories (Abramowitz in Prada, 2014)

c. Physical activity

Physical activity describes body movements caused by muscle contractions that produce energy expenditure. Maintaining a healthy body requires moderate or vigorous physical activity and is carried out for approximately 30 minutes every day of the week. Weight loss or

prevention of weight gain can be done by physical activity for about 60 minutes a day (Kurdanti et al, 2015).

d. Gender

According to Asil, E et al. (2014) Body Mass Index (BMI) in the overweight category is more commonly found in men. However, obesity rates were higher in women compared to men. The distribution of body fat also differs between women's and men's fat, men suffer from viscelar obesity more often than women.

2.2.4   Classification of Body Mass Index (BMI)

On the article *Association between body mass index (BMI) and hypertension in south Asian population: evidence from nationally representative surveys*stated that the classification of the Body Mass Index (BMI) according to WHO and also according to the proposed classification for the South Asian population as follows

Table 2.3. Classification of Body Mass Index according to WHO (2011)

Classification	Body Mass Index (BMI)
Under Weight	<18.5 kg/m²
Normal weight	18.5 -24.9 kg/m²
Overweight	25.0-29.9 kg/m²
Obese	30.0 kg/m²

Table 2.4 Classification of Body Mass Index (BMI) by South Asian

population

Classification	Body Mass Index (BMI)
Under Weight	<18.0 kg/m²
Normal weight	18.0 -22.9 kg/m²
Overweight	23.0-27.4 kg/m²
Obese	27.5 kg/m²

2.2.5 How to Calculate Body Mass Index (BMI)

Based on the method of measuring Body Mass Index (BMI) according to WHO 2011, to determine the body mass index of the sample, it is done by first measuring the sample's weight with a scale then measuring the height and entering it into the formula below:

$$BMI = \frac{Weight\ (kg)}{[Height(m)^2]}$$

Then interpret the results of the Body Mass Index (BMI) obtained into the classification table of Body Mass Index (BMI) according to WHO above

.

2.3   Relationship between Hypertension and Body Mass Index (BMI)

Increased Body Mass Index (BMI) is closely related to hypertension in both men and women. Weight gain (BB) is very influential on the mechanism of occurrence of hypertension in obese people, but the mechanism of this occurrence is not clearly understood, but it is suspected that in obese people there is an increase in plasma volume and cardiac output which will increase blood pressure. The incidence of hypertension in patients suffering from obesity according to the Sweedish Obese Study is 13.5% and this number continues to increase along with the increase in Body Mass Index (BMI) and Waist Hip Ratio (WHR) (Sihombing, 2010). Research conducted by Avihani RDH and Sulcan M in 2013 showed that around 7.5% of obesitic hypertension suffered by early adolescents (Avihani, Sulchan, 2013). Research on hypertension in obese adult patients in Indonesia shows that the incidence of hypertension in obese patients is 48.6%, the percentage in male patients who suffer from obesity is 50.1% and female patients who suffer from obesity are 47, 9%. These results when compared with the incidence of hypertension in patients suffering from obesity reported by the Swedish Obese Study are much higher (Sihombing, 2012)

Table 2.5 Synthesis Tab

Number.	Title, Author and year	Method (Design, Sample, Variable, Instrument,Analysis)	Result
1.	Title : Abdominal Obesity, Body Mass Index, and Hypertension in US Adults: NHANES 2007–2010 Author : Yechiam Ostchega, etc (2012)	**Desain**: The research design uses quantitative and cross-sectional data analy **Sample:** n: 17.170 **Variable**: The independent variables are obesity and body mass index. The dependent variable hypertension **Instrument**: The instruments used are stadio meters and weight scales and a sphygmomanometer **Data analysis:** chi-square test	1. Abdominal obesity, after adjusting for BMI classes and different covariables, changed into independently related to high blood pressure. That is, survey individuals categorised as abdominally overweight had nearly 50% accelerated odds of being hypertensive (odds ratio (OR) 1.51, 95% self assurance interval (cI) 1.27–1.81) after controlling for BMI. After adjusting for covariables, the corporations of people categorised as abdominally overweight and ordinary BMI; as abdominally overweight and overweight; and abdominally overweight and overweight every had a modern boom withinside the odds of high blood pressure whilst as compared with people who had a ordinary BMI and no belly obesity (OR 1.81, 95% cI 1.28–2.57, OR 1.87, 95% cI 1.55–2.25, and OR 3.23, 95% cI 2.63–3.96, respectively
2.	Relationship Body Mass Index With Hypertension In Hypertension Patients In	**Desain**: This research uses a descriptive design using a cross sectional approach **Sample:** n: 106 respondents	Based on these results, the highest number of hypertensive patients were hypertensive patients who had a normal BMI and had

	Puskesmas Kembaran 1 Banyumas Author : Amin Susanto, et al (2020)	**Variable**: The independent variables are obesity and body mass index. The dependent variable hypertension **Instrument**: The instruments used are stadio meters, weight scales and a sphygmomanometer **Data analysis:** spearman correlation statistics	grade 1 hypertension. The results of the analysis using the Spearman method showed a p-value of p 0.001 where p<0.05 and an r-value of 0.605, which means that there is a significant relationship between the index. Body Mass (BMI) with hypertension in respondents with hypertension.
3.	Relationship of Patient's Characteristic Nutritional, Status and Physical Activity with Hypertension in Elderly at Puskesmas Sako Palembang Author : Cahyani Dini, et al (2019)	**Desain**: This study was an observational analytical study with a cross sectional design. **Sample:** n: 106 respondents **Variable**: The independent variables are characteristic Nutritional, Status and Physical Activity. The dependent variable hypertension **Instrument**: interviews and questionnaires. **Data analysis:** Chi-square test and Binary Logistic Regression.	Chi-square analysis has shown that there are significant relationship betweenage (p=0,006 and 0,000; POR=7,25 and 31,88), sex (p=0,027; POR=2,87), family medical record (p=0,000; POR=11,3), educational status (p=0,000 and 0,001; POR=24,37 and 9,37), nutritional status (p=0,000; POR=11,43), physical activity(p=0,019 and 0,002; POR=4,01 dan 6,07) with hypertension. On the other hand, binary logistic regression analysis assumes that family medical record, educational status and nutritional status are the most influential factors that are affecting hypertension. Age, sex, family medical record, educational status, nutritional status and physical activity have significant relationship with the prevalence of hypertension. Family medical record, educational status and

			nutritional status are the most influential factors that are affecting the prevalence of hypertension.
4.	Title : Relationship between Body Mass Index and Hypertension Incidence in the Elderly at the Sei Langkai Health Center Batam City in 2021 Author : Revi Yulia, et al (2021)	**Desain**: The design of this study used an analytical observational research design with a cross sectional. **Sample:** n: 64 respondents **Variable**: The independent variables are obesity and body mass index. The dependent variable hypertension **Instrument**: The instruments used are stadio meters and weight scales and a sphygmomanometer **Data analysis:** chi-square test	Based on the results of research that has been carried out with the title Relationship Index Body Mass with Hypertension Incidence in the elderly at the Sei Langkai City Health Center BatamYear 2021 on August 14 - September 12 2021 consisting of 64 respondents. This research has been conducted at the Elderly Clinic at the Sei Langkai Health Center with observation sheet It was found that the results of the Chi-square test of 64 elderly who had Body mass index in the lean category (17- 18.4) as many as 2 people (9.1%) No hypertension (normal), moderate hypertension was 3 (13.6%), severe hypertension was 17 (77.3%), body mass index normal category (18.5- 25.0) as many as 11 people (64.7%) No hypertension (normal), moderate hypertension as much as 2 (11.8%), severe hypertension as much as 4

| 5. | Title :
Analysis of Dose-response Relationship between BMI and Hypertension in Northeastern China Using Restricted Cubic Spline Functions

Author :
Yangming Qu, at all (2019) | **Desain**: cross sectional approach
Sample: *n*: 21.435 respondents
Variable: Independent variables in this BMI; The dependent variable in this study is the Hypertension
Instrument: The instruments used are stadio meters and weight scales and a sphygmomanometer
Data analysis: The independent variable Body Mass Index uses a multivariable logistic regression model without conditions adjusted for age, gender, education level, and other variables. The dependent variable of hypertension used unvariate logistic regression. SPSS versi on 19.0 | (23.5%), body mass index in the normal obesity category (>25) as many as 11 people (44.0%) No hypertension (normal), 10 moderate hypertension (40.0%), hypertension weight as much as 4 (16.0%).

A general of 21,435 samples participated in our take a look at, screened for records and subsequently covered withinside the take a look at for 20,839 through deleting the lacking height/weight values. Among the 20,839 participants, the superiority of high blood pressure was 35.66% (7,431/20,839), with some of 3,836 for male and 3,595 for female. The imply age was (47.27 ± 13.34) years. Compared with high blood pressure participants, the no high blood pressure people had a decrease BMI $(23.46 \pm 3.55\,\text{kg/m2}$ vs $25.58 \pm 3.65\,\text{kg/m2}, P < 0.001)$. |

CHAPTER 3

CONCEPT FRAMEWORK AND HYPOTHESES

3.1 Conceptual Framework

In this study, researchers will examine The Correlation Between Body Mass Index (BMI) and The Incidence of Hypertension In Adults At Working Area Of Klatak Public Health Centers in 2022. This research framework will be manifested as follows:

Diagram 3.1 Conceptual Framework The Correlation Between Body Mass Index (BMI) and The Incidence of Hypertension In Adults At Working Area Of Klatak Public Health Centers in 2022.

3.2 Research Hypothesis

Hypothesis is a question of assumptions about the relationship between two or more variables that are expected to answer a question in research. Each hypothesis consist of a unit or part of the problem (Nursalam,2013).

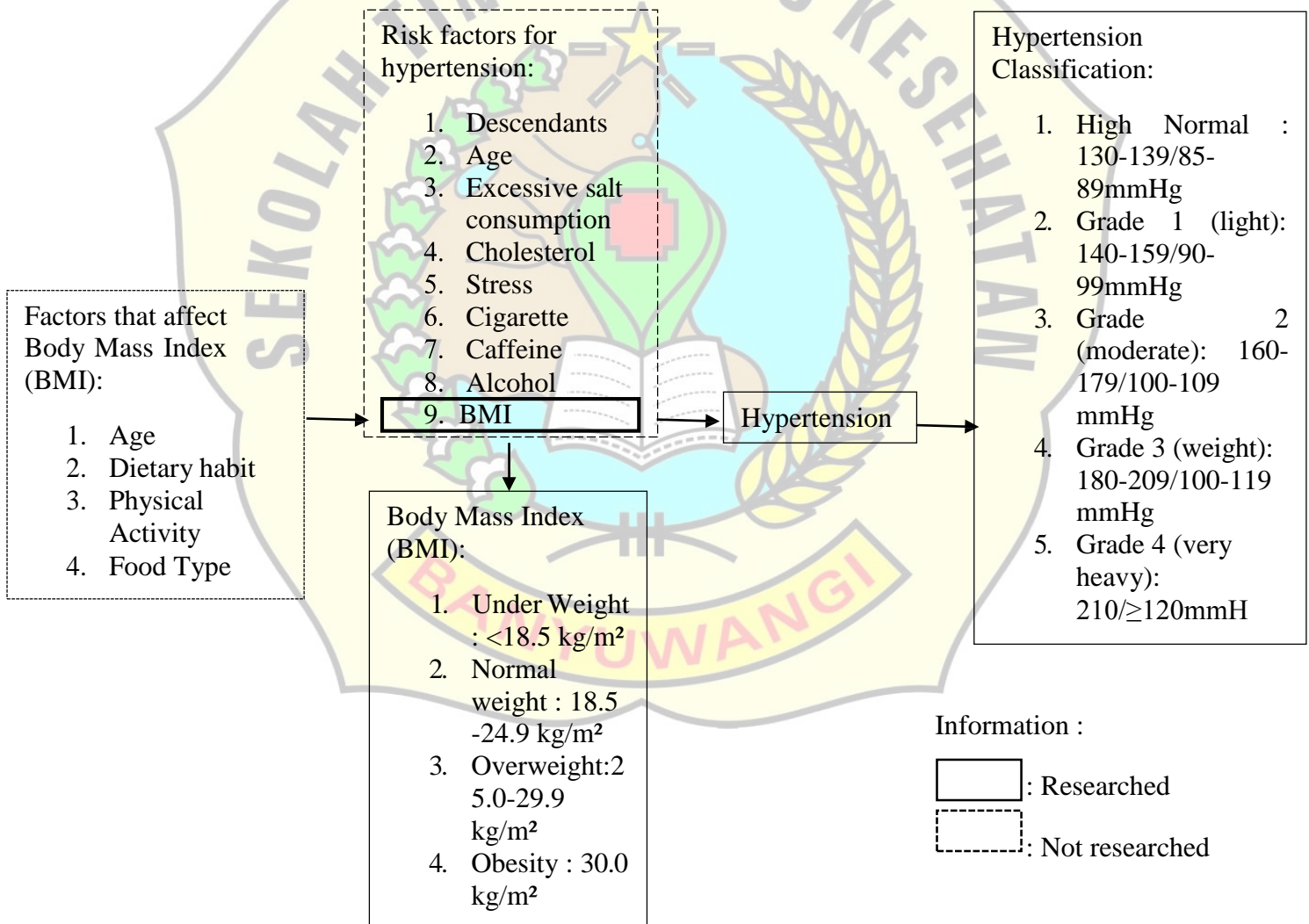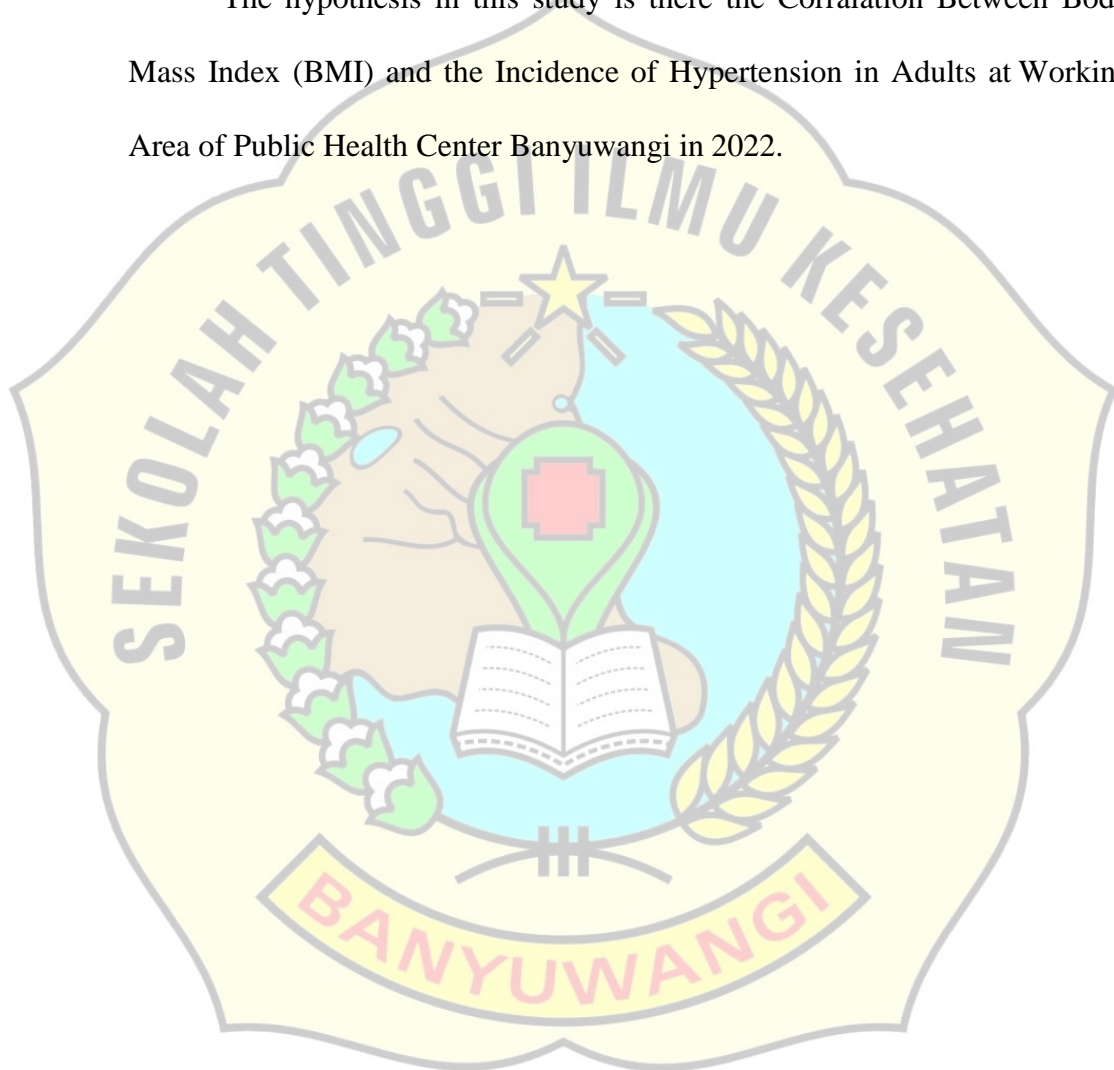The hypothesis in this study is there the Corralation Between Body Mass Index (BMI) and the Incidence of Hypertension in Adults at Working Area of Public Health Center Banyuwangi in 2022.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Types of Research and Research Design

4.1.1 Types of Research

This type of research is a strategy to achieve research objectives that has served as a guide or closure for researchers in the entire research process (Nursalam, 2016). Researchers can search, explain a relationship, estimate, and test based on existing theories. Correlative relationship refers to the tendency that the variation of a variable is followed by other variables (Nursalam, 2016).The type of research used by this researcher is a non-experimental research design with a "correlation study" which examines the relationship between variables.

4.1.2 Research Design

Research design is a scientific way to obtain data with a specific purpose and use or a frame of reference for studying the relationship between variables (Sugiyono, 2017). In this study, the author uses a cross-sectional research design, which is a type of research that emphasizes the time of measurement or observation of independent and dependent variable data only once at that time (Nursalam, 2016).

4.2 Framework

The framework is a work chart for the design of research activities

to be carried out (Nursalam, 2013).

```
┌─────────────────────────────────────────────────────────┐
│                       Population                          │
│   All adults with hypertension in the working area of     │
│        the Klatak Public Health Center 2022 N = 71        │
└─────────────────────────────────────────────────────────┘
                                              ┌──────────────────────┐
                                              │ Sampling Technique   │
                                              │ purposive sampling   │
                                              └──────────────────────┘
┌─────────────────────────────────────────────┐
│                    Sample                     │
│  The sample used is partly from adult         │
│  hypertension patients in the working area of │
│  the Klatak Public Health Center n:60         │
│  responden                                    │
└─────────────────────────────────────────────┘

┌─────────────────────────────────────────────┐
│    Research design : Cross Sectional          │
└─────────────────────────────────────────────┘

┌─────────────────────────────────────────────┐
│             Imformed consent                  │
└─────────────────────────────────────────────┘

┌─────────────────────────────────────────────┐
│    Data collection : Observation Data         │
└─────────────────────────────────────────────┘

┌─────────────────────────────────────────────┐
│      Data Processing and Data Analysis        │
│  Coding Scoring, Tabulating, and Spearman     │
│           Rank Test (SPSS 25)                 │
└─────────────────────────────────────────────┘

┌─────────────────────────────────────────────┐
│               Research result                 │
└─────────────────────────────────────────────┘

┌─────────────────────────────────────────────┐
│               Research Report                 │
└─────────────────────────────────────────────┘
```
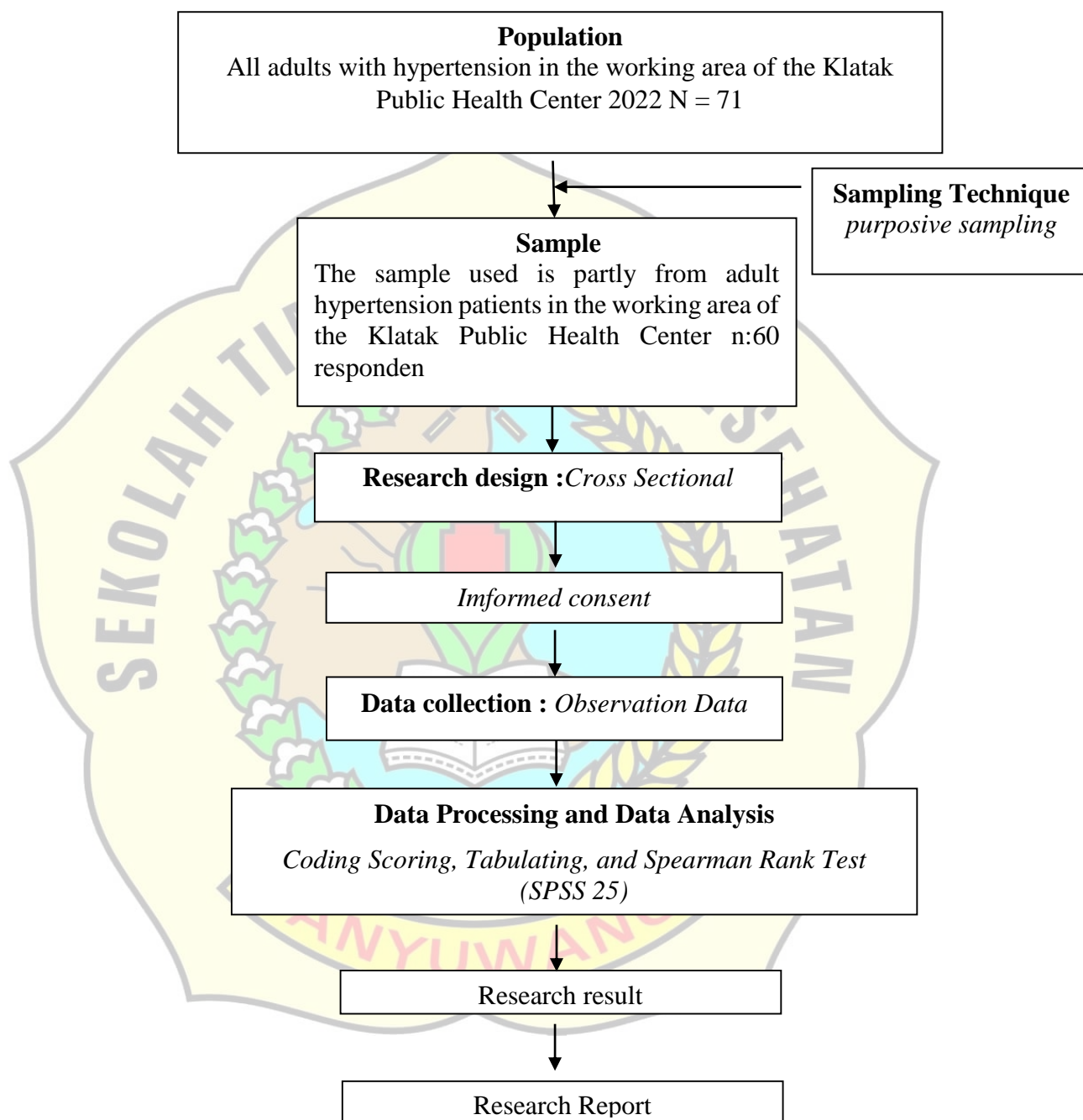
Diagram 4.1 Framework: The Correlation Between Body Mass Index
(BMI) and The Incidence of Hypertension In Adults At
Working Area Of Klatak Public Health Centers in 2022.

4.3 Population, Sample, and Sampling Technique

4.3.1 Research Population

Populationis a generalization area consisting of objects/subjects that have certain quantities and characteristics determined by researchers to be studied and then drawn conclusions (Sugiyono, 2016: 135). This study used a population of adults with hypertension in the working area of the Klatak Public Health Center.

4.3.2 Research Sample

The sample consists of an affordable part of the population that can be used as research subjects through sampling (Nursalam, 2016). The sample of this study was some adults with hypertension in the working area of the Klatak Banyuwangi Health Center 2022. In this study, to determine the sample, the researcher used the Slovin formula (Noor, 2011). With an error rate of 5% or 0,05 is as follows a number of people. Sample size formula:

$$n = \frac{N}{1 + N(d)^2}$$

Information:

N : total population

n : Number of samples

d : significant level (0.05) Nursalam (2013)

$$n = \frac{N}{1 + N(d)^2}$$

$$= \frac{71}{1 + 71(0,05)^2}$$

$$= \dfrac{71}{1 + (71 \times 0.0025)}$$

$$= \dfrac{71}{1,1775}$$

$$= 60,29 \text{ rounded to } 60$$

4.3.3 Sample Criteria

a. Inclusion Criteria

   Inclusion criteria are general characteristics of research subjects from a target population that is affordable and will be studied (Nursalam, 2016).

   The inclusion criteria in this study consisted of:

   1. Adults (20-60 years old) who are affected by hypertension in the working area of Klatak Public Health Center

   2. Willing to be a respondent

b. Exclusion criteria

   Exclusion criteria are eliminating or removing subjects who do not meet the inclusion criteria from the study for various reasons (Nursalam, 2016). The exclusion criteria in this study consisted of:

   1. Chronic disease sufferers

   2. Hypertension with mental disorders

4.3.4 Sampling Technique

Sampling is the process of selecting a portion of the population to be able to represent the population. Sampling techniques are the methods taken in taking samples, in order to obtain samples that are truly in accordance with the entire research subject (Nursalam, 2016). The research was conducted using the Non Random (Non Probability) method. This method is sampling that is not based on calculated possibilities, but is solely based on practical aspects. This method includes several techniques, among others, which will be used by researchers, namely the purpose sampling technique (Notoatmodjo, 2011).

4.4. Variable Identification

Variables are behaviors or characteristics that give different values to something (objects, people, etc.). The characteristics possessed by members of a group (people, objects, situations) are different from those of the group. In research, variables are characterized as degrees, sums and differences. Variables are also concepts from various abstract levels which are defined as a facility for measurement and or manipulation of a study (Nursalam, 2016).

4.4.1 Independent Variable

An independent variable is a variable that affects or its value determines another variable. A stimulus activity manipulated by the researcher creates an impact on the dependent variable. Independent variables are usually manipulated, observed, and measured to determine

their relationship or influence on other variables. In nursing, the independent variable is usually a stimulus or nursing intervention given to the client to influence the client's behavior (Nursalam, 2016). In this study the independent variable is Body Mass Index (BMI).

4.4.2 Dependent Variable

The dependent variable is a variable whose value is determined by another variable. The response variable will appear as a result of the manipulation of other variables. In behavioral science, the dependent variable is the observed behavioral aspect of an organism that is subjected to a stimulus. In other words, the dependent variable is a factor that is observed and measured to determine whether there is a relationship or influence of the independent variable (Nursalam, 2016). In this study the dependent variable is the incidence of hypertension.

4.5 Operational Definition

An operational definition is a definition based on the observed Characteristics of the thing being defined. It is these observable (measurable) characteristics that are the key to operational definitions. Observable means that it allows researchers to make careful observations or measurements of an object or phenomenon which can then be repeated by others (Nursalam, 2016).

Table 4.1 Operational Definition:The Correlation Between Body Mass Index (BMI) and The Incidence of Hypertension in Adults in Public Health Centers in 2022.

No.	Variable	Definition	Indicator	Measuring instrument	Scale	Score
1.	Independent variable: Body Mass Index (BMI)	A parameter or measuring instrument that takes the value of the quotient between body weight (BB) in kilograms with the square of height (TB) which is used to determine a person's weight status to determine whether they are in the normal category or not.	1. Weight 2. Height	Scales and Microtoise Stature meter	Ordinal	1. Under Weight : <18.5 kg/m² 2. Normal weight : 18.5 - 24.9 kg/m² 3. Overweight:25.0-29.9 kg/m² 4. Obesity : 30.0 kg/m² (According to WHO)
2.	Variable dependent: Hypertension	Hypertension is an increase in systolic blood pressure above the normal limit of more than 140 mmHg and diastolic blood pressure of	Systolic and Diastolic	*Sphygmomanometer* and observation sheet	Ordinal	Blood pressure for hypertension : 1. High Normal : 130-139/85-89mmHg 2. Grade 1 (light): 140-

		more than 90 mmHg that occurs continuously over a long period and hypertension is usually accompanied by various symptoms such as headaches or heaviness in the neck, vertigo, heart palpitations, fatigue, blurred vision etc.			159/90-99mmHg 3. Grade 2 (moderate): 160-179/100-109 mmHg 4. Grade 3 (weight): 180-209/100-119 mmHg 5. Grade 4 (very heavy): 210/≥110mmHg

4.6 Research Instruments

The research instrument is a tool used to obtain information from respondents in terms of reports about their personalities or things that are known (Nursalam, 2013). In this study, the instruments used to measure the relationship between Body Mass Index (BMI) and the incidence of hypertension in adults in the work area of the Banyuwangi Public Health Center in 2022 are:

1. Blood pressure measuring device (tensimeter) An instrument for measuring a person's blood pressure using a manual type of sphygmomanometer

2. Weighing device A tool for weighing a person's weight (kg) using a type of digital scale

3. Height measuring device An instrument for measuring a person's height (cm) using a type of Microtoise Staturemeter

4. Measuring instrument with observation

   Observation is a technique of collecting data by observing, recording and making judgments. The most effective way to do this method is to arrange it into a format that contains items about the events or behaviors that are described as going to happen (Arikunto, 2014). In this study, the observation technique was used to determine the incidence of hypertension indications which were carried out by direct measurement of blood pressure in the subjects studied using a sphygmomanometer, measuring body mass index (BMI) which had previously been weighed and height after it was recorded on the observation sheet that has been provided.

4.7 Research Location and Time

4.7.1 Research Locations

The location of the research will be carried out in the working area of the Klatak Public Health Center

4.7.2 Research Time

The research study took place in January 2022. Further data management in March 2022.

4.8 Collection or Process of Data Retrieval

4.8.1 Data Collection

Data collection is a process of approaching the subject and the process of collecting the characteristics of the subject required in a study. The steps in data collection depend on the research design and the instrument technique used (Nursalam, 2016).

4.8.1 Data Collection Process

Researchers must perform five tasks in the data collection process. These tasks are related and carried out simultaneously, in other words not sequentially. These tasks include selecting subjects, collecting data consistently, maintaining control in research, maintaining integrity or validity, and solving problems (Nursalam, 2016).

The data collection technique in this research is by measuring using a questionnaire on the respondents. The steps of data collection are as follows.

1) Before conducting the research, the researcher first asked for a preliminary research study letter from the Banyuwangi STIKes Institution which was then given to the Banyuwangi Health Office to obtain the most hypertension data at the Banyuwangi Public Health Center.

2) Then go to the health center which has the highest data on the incidence of hypertension in Banyuwangi and send a letter of

application to conduct research at the health center

3) Approach and distribute Informed consent to prospective respondents, if they agree, they are given to fill out the informed consent

4) Respondents were given an explanation of the objectives of the researcher.

5) Measuring Body Mass Index with scales and meterline.

6) Measure blood pressure and record in the observation sheet.

7) Perform data processing and data analysis.

8) Summing up the results

4.9 Data Analysis and Data Processing

4.9.1 Data Analysis

Data analysis is a very important part to achieve the main objective of the research, which is to answer research questions that reveal phenomena (Nursalam, 2016). Prior to analyzing the data, the data that has been collected in sequence will undergo a process of editing, coding, scoring, and tabulating.

1. *Editing*

   Editing is an attempt to re-examine the correctness of the data obtained or collected (Aziz Alimul H, 2016). Editing in this study is to check the completeness of the contents of the observation sheet and demographic data, the suitability of the scores listed by the researcher.

2. *Coding*

coding is coding the data intended to translate data into codes which are usually in the form of numbers (Jonathan Sarwono, 2015).

These signs can be adapted to a more favorable understanding of the researcher, so these signs can be made by the researcher himself.

Scale for Body Mass Index (BMI) :

a. Under Weight   = 1

b. Normal weight   = 2

c. Overweight   = 3

d. Obesity   = 4

Scale for Hypertension :

a. High Normal   = 1

b. Grade 1 (light)   = 2

c. Grade 2 (moderate) = 3

d. Grade 3 (weight)   = 4

e. Grade 4 (very heavy)=5

3. *Tabulating*

Tabulating is an activity to describe respondents' answers in a certain way, such as presenting data in a table consisting of several lines and columns. Tables can be used to present several variables from observations, surveys, or research so that the data is easy to read and

understand (Jonathan Sarwono, 2015). As for management data is interpreted using a cumulative scale:

Scale for Body Mass Index (BMI) :

a. Under Weight   = <18.5 kg/m²

b. Normal weight   = 18.5 -24.9 kg/m²

c. Overweight   = 25.0-29.9 kg/m²

d. Obesity   = 30.0 kg/m²

Scale for Hypertension :

a. High Normal   = 130-139/85-89 mmHg

b. Grade 1 (light)   = 140-159/90-99mmHg

c. Grade 2 (moderate) =160-179/100-109 mmHg

d. Grade 3 (weight)   = 180-209/100-119 mmHg

e. Grade 4 (very heavy)= 210/≥110mmHg

4.9.2 Data analysis

To find out the relationship between the two variables, statistical tests were carried out. The type of analysis used is unvariate and bivariate analysis. Unvariate analysis is used to describe the data set in the form of frequency, the value with the highest frequency, the minimum and maximum values of the research variables. Bivariate analysis was used to analyze the relationship between the variable of communication skills and the variable of professionalism. The statistical test used by the researcher is the Spearman rank test.

Researchers in managing data use SPSS (Statistic Program for Social

Scient) version 25 software.

Table 4.2 Bivariate Test Results Interpretation

No.	Parameter	Score	Interpretation
1.	Correlation Strength	0.00-0.199 0.20-0.399 0.40-0.599 0.60-0.799 0.80-1.00	Very weak Weak Currently Strong Very strong
2.	p value	P<0.05 P>0.05	There is a significant correlation between the two variables tested There is no significant correlation between the two tested variables
3.	Correlation Direction	+ (positive) - (negative)	Unidirectional, the greater the value of one variable, the greater the value of the other variable In the opposite direction, the greater the value of one variable, the smaller the value of the other variable

Table 4.3 Analysis of Independent Variables and Dependent Variables

Aim	Variable	Measurement Scale	Statistical Approach
Identify demographic variabel data	1. Age 2. Gender 3. Tribe 4. Religious 5. Residence 6. Profession 7. Income 8. Disease History 9. Level of education	Ratio Nominal Ordinal Ordinal Ordinal Ratio Ordinal Ordinal	Descriptive Statistics
The Correlation Between	Body Mass Index (BMI) : 1. Under Weight : <18.5 kg/m²	Ordinal	Correlation test *rank spearman*

| Body Mass Index (BMI) and The Incidende Of Hypertension In Adults At Working Area Of Klatak Public Center Banyuwangi 2022 | 2. Normal weight : 18.5 - 24.9 kg/m²
 3. Overweight:25.0-29.9 kg/m²
 4. Obesity : 30.0 kg/m²

 Hypertension classification:

 1. High Normal : 130-139/85-89mmHg
 2. Grade 1 (light): 140-159/90-99mmHg
 3. Grade 2 (moderate): 160-179/100-109 mmHg
 4. Grade 3 (weight): 180-209/100-119 mmHg
 5. Grade 4 (very heavy): 210/≥110mmHg | Ordinal | |

4.10 Research Ethics

In conducting this research, it is necessary to apply for permission to the Head of the Banyuwangi Health Office to obtain approval for a preliminary study permit, taking into account ethics, which include:

4.10.1 *Informed consent* (**Approval Sheet**)

Informed consent is information that must be given to the subject in full about the purpose of the research to be carried out and has the right to freely participate or refuse to become a respondent (Nursalam, 2016).

4.10.2 *Anonymity* (**without a name**)

The subject does not need to include his name on the data collection sheet, he only needs to write a number or code to ensure the confidentiality of his identity. If the nature of the researcher

does demand to know the identity of the subject, the researcher must obtain prior approval and take steps to maintain confidentiality and protect the answer (Wasis, 2015).

4.10.3 *Confidentiality*(confidentiality)

Confidentiality is an ethical problem in a research which is carried out by guaranteeing the confidentiality of research results, both information and other issues. All information that has been collected is guaranteed to be confidential by the researcher, only certain data groups will be reported on the research results (Aziz, Alimul H, 2016).

4.10.4 *Non Maleefficiency (No Harm)*

Non Maleefficiency is a principle which means that every action taken on a person does not cause physical or mental harm (Abrori, 2016).

4.10.5 *Veracity* (Honesty)

Be honest when collecting data, literature, methods, research procedures, to publication of results. Be honest about the shortcomings and failures of the research process. Not recognizing work that is not his job(Abrori et al., 2016). Researchers do not increase or decrease the results when collecting data.

4.10.6 *Respect for Person* (Respect for Human Dignity and Dignity)

Respecting and respecting people there are two things that need to be considered, namely researchers must consider deeply the possible dangers and misuse of research and protect respondents

who are vulnerable to research hazards.(Abrori et al., 2016).

Researchers do not force if the respondent wants to resign.

4.10.7 *Beneficience***(Maximizing Benefits and Minimizing Risks)**

The ethical imperative to seek the maximum benefit and minimize losses and risks for the subject and minimize research errors. In this case the research must be carried out properly and accurately, and the respondents are safe and healthy(Abrori et al., 2016). Researchers in maintaining the accuracy and accuracy and safety of researchers conduct a re-examination of the research instruments that will be used by respondents so that errors do not occur in the future.

This research has passed the ethical test of STIKES Banyuwagi No: 000046/01/KEPK-STIKESBWI/I/II/2022 has been approved and declared feasible to be applied

4.10.8 Justice

This value is reflected in professional practice when nurses work for the right therapy according to law, practice standards and the right beliefs to obtain quality health care. For example, when the official nurse is alone and when a new client comes in and there is also a nursing client who needs the help of a nurse, the nurse must consider the factors in these factors and then act in accordance with the principle of justice.

4.10.9 Limitation of the study

The data collection process was only carried out at the Klatak Health Center because the Posyandu for the elderly was canceled due to the soaring number of Covid cases.