

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Stress is a person's reaction both physically and emotionally (mentally/psychically) when there is a change in the environment that requires a person to adjust. Stress is a condition in which a person feels unsuitable with the situation physically and psychologically and the source comes from biology and social systems (Neural & Timothy, 2018). Stress is an unpleasant physical and psychological pressure, stress can stimulate the kidney glands by releasing the hormone adrenaline which triggers the heart to beat faster and stronger, thus making blood pressure increase. Hypertension is one of the most pressing public health challenges and is recognized as the largest contributor to the global disease burden (Dzau & Balatbat, 2019). Hypertension is often referred to as a silent killer because it is a deadly disease and often causes no complaints or symptoms (Mohamed, Hanafy, & El-Naby, 2016). Even hypertension can cause other diseases that are classified as serious and deadly diseases and can increase the risk of heart attack, stroke and kidney failure (Kurniawan & Helvetia, 2019).

WHO estimates that the number of people with hypertension will increase to 972 million in 2021 (Pratama, 2018). Globally, 31.1% of the adult population (13.9 billion people) suffer from hypertension. the prevalence of hypertension was higher in low-income countries and prevention (31.5%) than in high-income countries (28.5%). Awareness, treatment, control of hypertension is much lower in low-income countries and prevention than in

high-income countries (Wyss et al., 2020). The 2018 Basic Health Research (Riskesdas) shows that in Indonesia, the prevalence of the population with high blood pressure is 34.11% or about 87 million people from the total population. The prevalence of high blood pressure in women is higher at 36.85% or about 94 million people compared to men with a prevalence of 31.34% or around 80 million people (Kemenkes, 2018).

Based on the 2018 East Java health profile explained that one of the provinces in Indonesia that still has problems with high hypertension rates is East Java with a hypertension percentage of 20.43% or around 1,828,669 residents, with a male proportion of 20.83% or 825,412 residents. and women. 20.11% or 1,003,257 population (Ministry of Health, 2018). While in Banyuwangi the percentage of hypertension reaches 30% of the total population (Kemenkes, 2018). According to data from the Banyuwangi District Health Office in 2019, the Klatak Health Center was first ranked with a hypertension rate of 18,926 patients.

The prevalence of stress is quite high where almost more than 350 million people in the world experience stress and is a disease with the 4th rank in the world according to WHO (Waningsiha, 2019). Based on the prevalence of mental disorders the number of emotional (psychological distress) in Indonesia (anxiety, stress, and depression) in the population reaches 11.6% or about 19 million people from the total national population is 6.0% (37,728 people from the subjects analyzed). The prevalence of the population WHO experiencing mental emotional disorders in East Java by 6.5% of the subjects analyzed (Riskesdas, 2013). Based on the results of a preliminary study

conducted on February 24<sup>th</sup>, 2022, through a questionnaire through online interviews with 5 patients in the working area of the Klatak Health Center by DASS-21, it was found that 2 patients experienced mild stress, 3 patients experienced moderate stress, and no patient experienced stress heavy.

Meanwhile, based on the results of the preliminary study that the author has done at the Klatak Health Center, it is known that there are 5 respondents, 2 respondents (31%) in the mild category, 3 respondents (69%) in the moderate category. 5 respondents experienced hypertension, it can be concluded that people who suffer from hypertension in the klatak health center experience mild and moderate levels of stress.

Factors that affect stress include, first, personality where people with type a personality are more prone to stress such as impatient, easily tensed, irritable, work knows no time, is a personal trait of heredity for each individual that can cause stress. on the nature of the person. Therefore, the symptoms of stress that appear in every job must be properly regulated in one's personality. Second, cognitive factors are something that causes stress depending on how individuals assess and interpret an event cognitively, if someone assesses a problem negatively and is unable to solve the problem, stress will occur. Third, environmental factors include the burden or work that is too heavy, because changes occur so that adjustments are needed to the work that makes a person experience the threat of stress. Stress has an impact stomach pain, diarrhea or constipation, heartburn and acid reflux, headaches, troubled menstrual cycles, decreased sex drive, breathing problems, diabetes, and increased blood pressure. Prolonged stress triggers the release of hormones of hormone

adrenalin, norepinephrine, kortisol that cause an increase in heart rate and a decrease in blood vessel diameter, both of which cause an increase in blood pressure. Long-lasting stress will triggers the release of hormones causes an increase in heart rate heart and decreased diameter blood vessels, both of which causes an increase in blood pressure (Anthony , 2019).

Adrenaline is a hormone produced by the adrenal glands after getting a signal from the brain when a stressful situation arises. Norepinephrine hormone is the same as adrenaline which is released by the adrenal glands and comes from the brain. The function of the hormone norepinephrine is to make a person stay focused and awake during stress. The hormone cortisol is also produced by the adrenal glands and is also known as the stress hormone. this hormone determines a person's response to stressful and stressful situations (Allert Benedicto , 2018).

The sympathetic nervous system also signals to the adrenal medulla to release epinephrine and norepinephrine into the bloodstream. Adrenaline, thyroxine, and cortisol as the main stress hormones will increase in number and have a significant effect on the homeostatic system. Adrenaline which works synergistically with the sympathetic nervous system affects the increase in heart rate and blood pressure. Activation of the sympathetic system will cause vasoconstriction so that blood is pumped more a lot in a moment, where the stroke volume increase. The increased stroke volume will causes blood pressure to increase (Buanasari, 2019). Hypertension is a disease that often suffered by the community both young and elderly This also includes a group of diseases that dangerous can cause death categorized as hypertension if the

increase in blood pressure above the normal limit systolic pressure  $>140$  mmHg and for for diastolic pressure  $>90$  mmHg. Common causes of hypertension because of two factors, namely internal factors such as genetics (heredity), race, age and external factors such as being overweight body, smoking habit, stress (Situmorang & Wulandari, 2020).

One of the actions for people with hypertension can be done by managing stress, namely the ability to regulate or manage oneself is a continuous process that requires a willingness to change, both behavior and habits so that in the end we are capable of effective people. Several ways to manage stress are identification of the causes of stress, good time management, making a change, sharing and expressing, keeping a diary, mental visualization and comparison, relaxation, eating healthy and exercising, overcoming the fear of failure. Relaxation of blood pressure, both systolic and diastolic pressure. The work of this therapy can provide cardiopulmonary stretching (Izzo, 2018). The duty as a health worker for people with hypertension is to educate them to carry out lifelong treatment at public health centers and other health services continuously to monitor blood pressure or even seek treatment so that it does not cause complications. Based on the above background, the researcher is interested in conducting a study entitled the correlation between stress levels and blood pressure in patients with hypertension.

## **1.2 Problem Formulation**

Based on the background above, the researchers formulated the problem: Is there a The Correlation Between Stress Levels And Blood Pressure

in Patients With Hypertension At The Working Area of Klatak Public Health Center in 2022.

### **1.3 The Objective of The Study**

#### **1.3.1 General Aim**

To find out the The Correlation Between Stress Levels And Blood Pressure In Patients With Hypertension The Correlation Between Stress Levels And Blood Pressure in Patients With Hypertension At The Working Area Of Klatak Public Health Center in 2022.

#### **1.3.2 Specific Aim**

1. Identifying the stress levels in patients with Hypertension at the Working Area of Klatak Public Health Center in 2022.
2. Identifying the blood pressure in patients with Hypertension at The Working Area of Klatak Public Health Center in 2022.
3. Analyzing the the Correlation between stress levels and blood Pressure in Patients with Hypertension at the Working Area of Klatak Public Health Center in 2022.

### **1.4 The Expected Result**

Based on the research objectives, the expected benefits of this research are as follows:

#### 1.4.1 Theoretical

Develop knowledge in the field of health, especially nursing science and can provide knowledge and become input for further research.

#### 1.4.2 Practical

##### 1. For Respondents

Can be more active in participating in every activity carried out by the health center related to self-control of hypertension sufferers. In order to have a good stress level in order to control blood pressure.

##### 2. For Institutions

To refer to health center / other research with intervention this research is able to provide input to health institutions as a reference material to improve knowledge, and is useful for all students of the Banyuwangi Health Sciences College and used as a reading resource in the library.

##### 3. For Future Researchers

The results of this study can be used as a source of information and reference for further researchers in order to conduct research with different variables.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Hypertension Concept

##### 2.1.1 Definition of Hypertension

Hypertension is also often referred to as the silent killer because it is a deadly disease. In fact, hypertension cannot directly kill the sufferer, but hypertension triggers the occurrence of other diseases that are classified as heavy and deadly and can increase the risk of heart failure, stroke and kidney failure (Jill Lolong, 2018)

Hypertension, a disease of high blood pressure, is a chronic condition characterized by increased blood pressure on the walls of the arteries. This situation causes the heart to work harder to circulate blood throughout the body through blood vessels (Yanita, 2017).

Systolic pressure is the blood pressure when the heart contracts or beats pumping blood. At rest, systolic is said to be normal if it is at a value of 100/140 mmHg, while diastolic is said to be normal if it is at a value of 60-90 mmHg (Yanita, 2017).

High blood pressure can be caused by various things factors, one of which is stress. Stress can trigger hypertension through activation of the sympathetic nervous system which results in an intermittent (uncertain) rise in blood pressure (Andria, 2018). When a person experiences stress, the hormone adrenaline will be released and will then increase blood pressure through arterial contraction (vasoconstriction) and an increase in heart rate. If stress continues, blood pressure will



remain high so that the person will experience hypertension (South, 2017). Conclusion: Hypertension is a disease that can affect anyone, young or old.

### 2.1.2 Etiology of Hypertension

Hypertension or high blood pressure is caused by various factors that greatly affect each other. The condition of each person is not the same so that the factors that cause hypertension in each person are very different (Yekti, 2018).

The following are factors that cause hypertension in general. Just one thing about our body then we will easily suffer from hypertension (Yekti, 2018).

#### 1. Stress

Stress is a condition when a person feels tense and stressed emotionally and physically. This condition can occur because of certain events or thoughts that make a person frustrated, angry, or nervous. When a person experiences stress, the body releases stress hormones, namely adrenaline, cortisol, and norepinephrine, which cause an increase in heart rate and stronger heart muscle contractions. The blood vessels that carry blood to the heart also dilate, increasing the amount of blood pumped. Stress will increase peripheral vascular resistance and cardiac output so that it will stimulate sympathetic nerve activity. The stress experienced by a person will stimulate the sympathetic nerves which will trigger the heart's work and cause an increase in blood pressure.

## 2. Toxin

Toxins are waste products that should be disposed of because they are toxic. Under normal circumstances, our liver will excrete waste products through the intestinal tract and skin. While the kidneys remove the remains of waste through the urinary tract or bladder.

## 3. Genetic Factors

The presence of genetic factors in certain families will cause families with hypertensive parents to have twice the risk of suffering from hypertension or blood pressure than individuals who do not have a family history of hypertension or blood pressure. It's good from now on we check the family's medical history so that we can anticipate and prevent.

## 4. Age

Sensitivity to hypertension will increase with increasing age of a person. Individuals who aged over 60 years, 50-60% have blood pressure greater than or equal to 140/0 mmHg. This is the effect of degeneration that occurs in people who get older. The aging process is a natural thing that we cannot avoid. However, growing old by staying healthy is something we can try from the first. Health is the most precious gift to our lives besides faith.

a. Age Classification

The age categories according to the Ministry of Health of the Republic of Indonesia in 2009 are as follows:

1. Toddler age 0-5 years
  2. Childhood age 5 – 11 years
  3. Early adolescence 12-16 years old
  4. Late adolescence aged 17-25 years
  5. Early adulthood 26-35 years old
  6. Late adulthood 36-45 years old
  7. Early elderly age 46-55 years
  8. Late old age 56-65 years old
  9. Seniors aged 65 – above
5. Gender

Each sex has a different structure of organs and hormones. Likewise for women and men. With regard to hypertension or blood pressure, men have a higher risk of developing hypertension early. Men also have a greater risk of cardiovascular morbidity and mortality. Meanwhile, women are usually more prone to hypertension or blood pressure when they are over 50 years old. It is very important for us to maintain health from an early age. Especially those who have a family history or family history of the disease.

## 6. Ethnic

Every ethnicity has its own peculiarities which characterizes and distinguishes one another. Hypertension or blood pressure is more common in black people than white people. Black people have lower renin levels and greater sensitivity to vasofresin

## 7. Overweight (Obesity)

Epidemiological research mentions a relationship between body weight and blood pressure in both hypertensive and normotensive patients. In the population where there was no increase in body weight with age, there was no increase in blood pressure with increasing age. What greatly affects the increase in blood pressure is obesity in the upper body with an increase in the amount of fat in the abdomen or central obesity.

## 8. Nutrition

Sodium is an important cause of primary hypertension. High salt intake will cause excessive release of natriouretic hormone which will indirectly increase blood pressure. High salt intake can be detected that is more than 14 grams per day or if converted into a tablespoon is more than 2 tablespoons. It doesn't mean that we eat 2 tablespoons of salt per day, but that salt is found in salty or savory foods that we eat every day.

## 9. Smoke

Smoking is a modifiable risk factor for hypertension or blood pressure. Smoking is a potential risk factor to be eliminated in an

effort to counter the currents of rising blood pressure in particular and cardiovascular disease in general in Indonesia.

#### 10. Drugs

Additive components in drugs will also trigger an increase in blood pressure. Drug addiction may seem trivial but it is very deadly. The bad effects it causes very big. There are many parties, especially the younger generation who reason to use drugs for reasons of life style and association, but they do not understand that it is a healthy life and free from death in vain.

#### 11. Alcohol

Excessive use of alcohol will also trigger a person's blood pressure. Apart from not being good for our blood pressure, alcohol also makes us addicted which will be very difficult to break free. Quitting the habit of consuming alcohol is very good, not only for hypertension but also for our overall health.

#### 12. Caffeine

Coffee is a beverage that contains a lot of caffeine. Similarly, tea even though the content is not as much as coffee. Caffeine content is not only bad for blood pressure in the long term, but in certain people it also causes bad effects such as not being able to sleep, heart palpitations, shortness of breath, etc.

#### 13. Lack of exercise

In modern times like today, many activities can be done in a fast and practical way, so that automatically the body will not be easy

to move. In addition, with the extraordinary busyness, humans also feel they do not have time to exercise. As a result, this condition triggers high cholesterol and also blood pressure that continues to strengthen, giving rise to blood pressure or hypertension.

#### 14. High cholesterol

Excessive fat content in the blood can cause cholesterol to form on the walls of blood vessels. This can make blood vessels narrow and consequently blood pressure will increase.

#### 15. Anxiety

Anxiety is a state of personality feeling, anxiety, uncertainty, or fear of reality or perceived threats from actual sources that are not known or known (Laraia & Stuart, 2017). Taylor (2018) says that anxiety is something that is not clear, there is a feeling of restlessness and anxiety restless with sources that are not specific and unknown to someone. Experts divide the form of anxiety into two levels, namely: psychological level; anxiety that manifests as psychological symptoms, such as tension, confusion, worry, difficulty concentrating, feeling uncertain and so on, physiological level; anxiety that has affected or manifested in physical symptoms, especially in the nervous system, for example unable to sleep, heart palpitations, shaking, stomach nausea, and so on. Mental distress or anxiety caused by excessive concern there is a problem that is being faced (real) or imagined that might occur. The most common anxiety caused by diseases, one of which is hypertension.

### 2.1.3 Classification of Hypertension

According to the World Health Organization (WHO) the classification of blood pressure in adults is divided into groups of hypotension, normal, prehypertension, hypertension grade 1, hypertension grade 2, and hypertension emergency level.

Table 2.1 Classification of Blood Pressure According to WHO

Category	Systolic (mmHg)	Diastolic (mmHg)
Hypotension	< 90	< 60
Normal	90 – 119	60 – 79
Prehypertension	120 – 139	80 – 89
Stage 1 hypertension	140 – 159	90 – 99
Stage 2 hypertension	160 – 179	100 – 109
Hypertension stage 3 or emergency	≥ 180	≥ 110

Source: Sani, 2010 in Jafar, 2018

### 2.1.4 Pathophysiology of Hypertension

The mechanisms that control the constriction and relaxation of blood vessels are located in the vasomotor center, in the medulla of the brain. From the vasomotor center, it begins in the sympathetic nerve which continues down to the spinal cord and exits from the column of the spinal cord to the sympathetic ganglia of the thorax and abdomen. Stimulation of the vasomotor center is delivered in the form of impulses that travel downward through the sympathetic nervous system to the sympathetic ganglia. At this point, the preganglionic neurons release acetylcholine, which stimulates the postganglionic nerve fibers to the blood vessels, where the release of norepinephrine causes the blood vessels to constrict. Various factors such as anxiety and fear can affect the response of blood vessels to vasoconstrictive stimuli. Individuals with

hypertension are very sensitive to norepinephrine, although it is not clear why this is happened (Padila, 2017).

At the same time that the sympathetic nervous system stimulates blood vessels in response to emotional stimuli, the adrenal glands are also stimulated, resulting in additional vasoconstrictive activity. The adrenal medulla secretes epinephrine, which causes vasoconstriction. The adrenal cortex secretes cortisone and other steroids, which can amplify the vasoconstrictor response of blood vessels, causing vasoconstriction resulting in the release of renin. Renin stimulates the formation of angiotensin I which is then converted to angiotensin II, a potent vasoconstrictor, which in turn stimulates aldosterone secretion by the adrenal cortex. This hormone causes renal tubular sodium and water retention, leading to an increase in intravascular volume. All of these factors tend to trigger hypertension (Padila, 2017).

For gerontological considerations. The structural and functional vessels of the peripheral vascular system are responsible for changes in blood pressure in the elderly. These changes include atherosclerosis, loss of elasticity of connective tissue and a decrease in vascular smooth muscle relaxation, which in turn reduces the distension and stretchability of blood vessels. Consequently, the aorta and large arteries are reduced in their ability to accommodate the volume of blood pumped by the heart (stroke volume), resulting in a decrease in cardiac output and an increase in peripheral resistance (Brunner & Suddart 2010 in Padila, 2017).



### 2.1.5 Clinical Symptoms of Hypertension

Hypertension has no specific symptoms. Physically, hypertension sufferers also do not show any abnormalities. Symptoms of hypertension tend to resemble symptoms or health complaints in general so that some people do not realize that they have hypertension. Yunita (2017).

Common symptoms that occur in people with hypertension include heart palpitations, blurred vision, headache accompanied by heaviness in the neck, sometimes accompanied by nausea and vomiting, ringing in the ears, restlessness, chest pain, fatigue, flushed face, and nosebleeds. , 2017).

Severe hypertension is usually accompanied by complications with several symptoms including visual disturbances, nerve disorders, heart problems, impaired kidney function, cerebral (brain) disorders. This cerebral disorder can result in seizures and bleeding of cerebral blood vessels, paralysis, impaired consciousness, even coma (Yunita, 2017).

The set of symptoms depends on how high the blood pressure is and how long the high blood pressure is uncontrolled and untreated. In addition, these symptoms also indicate complications due to hypertension that lead to other diseases, such as heart disease, stroke, kidney disease, and visual impairment (Yunita, 2017).

### 2.1.6 Complications of Hypertension

If a person has blood pressure then he will experience complications with other diseases such as: (Yekti, 2018)

## 1. Kidney

Hypertension or high blood pressure is one of the causes of chronic kidney disease. Chronic kidney disease is a disease suffered by one in ten adults who have to make the kidneys have to work harder.

## 2. Damaging brain performance

The ability of the brain will also be affected. Patients with high blood pressure in middle age will generally experience loss of cognitive-memory abilities, loss of problem solving, lack of concentration and loss of health. consideration for 25 years later

## 3. Damaging the performance of the heart

Continuous high blood pressure causes a person's heart to work extra hard. In the end this condition results in damage to the blood vessels of the heart, kidneys, brain and eyes. The heart which is in charge of distributing blood throughout the body can no longer perform its function.

## 4. Eye damage

A disturbance in blood pressure will cause changes in the retina at the back of the eye. Eye examination in patients with severe hypertension may reveal damage, narrowing of small blood vessels, \small blood leaks, on the retina and swelling of the retina of the eye.

## 5. Vascular resistance

This increased resistance causes the heart muscle to work harder to pump blood through the blood vessels. This increased

workload can strain the heart which can lead to cardiac abnormalities that are usually first seen as an enlarged heart muscle.

## 6. Stroke

Stroke is usually caused by a hemorrhage (leaking blood) or a blood clot (thrombosis) from the blood vessels that supply blood to the brain. The patient's symptoms and signs are evaluated to assess nerve damage. Stroke can cause weakness, tingling legs, difficulty speaking and vision becomes blurred or unable to see. Complications of hypertension can cause coronary heart disease, heart infarction, stroke and kidney failure. Complications of hypertension can cause a high mortality rate. The impact of hypertension in the elderly can trigger the risk of heart attack, stroke, and kidney failure (Ministry of Health, 2017).

### 2.1.7 Treatment

Hypertension treatment can be done in 2 ways, namely non-pharmacological therapy (Untario, 2017).

#### 2.1.7.1 non farmacological Therapy

Living a healthy lifestyle is very influential in lowering BP, and generally can reduce the risk of cardiovascular problems.

In patients who suffer from first degree hypertension, a healthy lifestyle strategy must be followed for at least 4-6 months. If after that time period there is no expected decrease in BP, it is highly recommended to start pharmacological therapy (PERKI, 2019).

Some healthy lifestyle that is recommended by PERHI (2019) include:

#### 1) Dietary sodium restriction

Some evidence explained that there is a relationship between salt consumption and the incidence of hypertension. Excessive salt consumption has been shown to increase BP and increase the prevalence of hypertension. Recommended use of sodium (Na) should be no more than 2 grams/day (equivalent to 5-6 grams of NaCl per day or 1 teaspoon of table salt). It's best to avoid food with high salt content (PERHI, 2019).

#### 2) Dietary Changes

People with hypertension are advised to consume a balanced diet containing vegetables, nuts, fresh fruits, low-fat dairy products, whole grains, fish, and unsaturated fatty acids (especially olive oil), and limit their intake of red meat and acids saturated fat (PERHI, 2019).

#### 3) Weight Reduction

The goal of weight control is to prevent obesity, these are BMI  $>25 \text{ kg/m}^2$ , and to target ideal body weight, these are BMI  $18.5 - 22.9 \text{ kg/m}^2$  with a waist circumference  $<90 \text{ cm}$  for men and  $<80 \text{ cm}$  for women (PERHI, 2019).

#### 4) Regular Physical Activity

Regular aerobic exercise is useful for the prevention and treatment of hypertension, while reducing the risk and cardiovascular mortality. Regular exercise with mild intensity and duration has a lower BP reduction effect compared to moderate or high intensity exercise, so people with hypertension are advised to exercise for at least 30 minutes of moderate intensity dynamic aerobic exercise (such as: walking, jogging, biking, or swimming) for 5-7 days per week (PERHI, 2019).

#### 5) Smoking Cessation

Smoking is a risk factor for vascular and cancer, smoking status must be asked at every patient visit and hypertensive sufferers who smoke should be educated to stop smoking (PERHI, 2019).

#### 6) Management stress

Stress management is about how we do an action by involving thinking activities, emotions, plans or implementation schedules, and how to solve problems. Stress management begins with identifying the sources of stress that occur in life. This step is not as easy as we imagine. Sometimes the source of the stress we face is not clear and without realizing it, we don't pay attention to stress as a step to minimize the burden of thoughts, feelings, and behavior. For example, we agree that work that is chased by deadlines

always causes discomfort, but because we don't care about the effects, we become accustomed to always working.

#### 2.1.7.2 Pharmacological Therapy

Generally, pharmacological therapy in hypertension begins when patients with grade 1 hypertension do not experience a decrease in BP after >6 months undergoing a healthy lifestyle and in patients with hypertension of degrees 2-3 (Untario, 2017). Five main classes of antihypertensive drugs that are routinely recommended are: ACEi, ARB, beta blockers, CCB and diuretics (PERHI, 2019).

Some basic principles of pharmacological therapy according to Untario (2017) that need to be considered to maintain compliance and minimize side effects, those are:

- 1) Give a single dose of medicine (if possible)
- 2) Give generic drugs (non-patent) if appropriate and can reduce costs
- 3) Give the drug to elderly patients (over the age of 80 years) such as those aged 55-80 years, taking into account comorbid factors
- 4) Do not combine angiotensin converting enzyme inhibitors (ACE-i) with angiotensin II receptor blockers (ARBs)
- 5) Provide comprehensive education to patients about pharmacological therapy
- 6) Monitor medication for side effects regularly

The hypertension management algorithm recommended by various guidelines has the same principle and below this is the general hypertension management algorithm proposed by the American college of cardiology / American Heart Association 2017) is :

## **2.2 Stress Concept**

### **2.2.1 Definition of Stress**

Stress is an unpleasant condition for individuals which can cause physical and psychological pressure on individuals (Manurung, 2018).

Stress is a disorder in the body and mind caused by changes and demands of life, which are influenced by the environment and the appearance of individuals in the environment (Lestari, 2018).

Researchers conclude that stress is a physiological and psychological response of the body to emotional stimuli that are influenced by both the environment and appearance in one's life (Hawari, P. D. 2017).

Stress can trigger hypertension through the activity of the sympathetic nervous system which results in an intermittent (uncertain) rise in blood pressure (Andria, 2017).

When a person experiences stress, the hormone adrenaline will increase blood pressure through contraction of the arteries (vasoconstriction) and an increase in heart rate. If stress continues, blood pressure will remain high so that the person will experience hypertension (South, 2018).

### 2.2.2 Causes of Stress

Stressors are factors in human life that result in a stress response.

Stressors come from various sources, both from physical, psychological, and social conditions and also appear in work situations, at home in social life, and other external environments. Stressors can be physical or physical such as air pollution and can also be related to the social environment such as social interaction. Individual thoughts and feelings that are considered a threat, either real or imagined, can also be a stressor.

The types of events that can cause stress include (Lestari, 2018):

1. Daily Hassles are small events that happen over and over every day such as work problems at the office, school and so on.
2. Personal stressor is a stronger threat or annoyance or a major loss to something that occurs at an individual level such as the loss of a loved one, job loss, financial problems and other personal problems. Age is one of the important factors that cause stress, the older you get person, the easier it is to experience stress. This is partly due to the fact physiology that has experienced a decline in various abilities such as visual abilities, thinking, remembering and hearing. Work experience also affects the emergence of work stress.
3. Appraisal, namely research on a situation that can cause stress is called stress appraisal. Assessing a situation that can cause stress depends on two factors, namely, factors related to the person (personal factors) and factors related to the situation. Personal factors include intellectual, motivation, and personality characteristics. Furthermore,



there are several other factors that can affect stress levels, namely, physical condition, the presence or absence of social support, self-esteem, lifestyle and also certain personality types.

### 2.2.3 Sources of Stress

Sources of stress can change as the individual develops, but stress conditions can occur at any time during life. The following are sources of stress, among others (Manurung, 2017):

#### 1. Individual self

The source of stress from this individual is related to the existence of conflict because it can produce two tendencies, namely approach conflict (appears when we are faced with a choice between two unpleasant situations).

#### 2. Family

Sources of family stress explain that the behavior, needs and personality of each family member have an impact on interactions with people from other members of the family that can cause stress. Family factors that tend to cause stress are the presence of new members, divorce and the presence of a sick family.

#### 3. Community and society

Contact with people outside the family provides many sources of stress. For example, children's experiences at school and competition. There are experiences around work and also with the environment that can cause a person to become stressed

### 2.2.4 Symptoms of Stress

Stress has two symptoms, namely physical and psychological symptoms (Bandiyah, 2017):

1. Symptoms of physical stress may include heart palpitations, rapid breathing and/or gasping for air, dry mouth, shaking knees, hoarseness of voice, stomach twisting, headache like being tied up, sweating profusely, wet hands, unreasonable fatigue, feeling tired, hot, tense muscles. Stressful states can make people who experience it feel psychoneurotic symptoms, such as anxiety, restlessness, restlessness, sadness, depression, suspicion, phobia, confusion, misunderstanding, aggression, lability, irritation, anger, irritability, excessive scrutiny.

#### 2.2.5 Stress Model

The stress model is to assist individuals in overcoming unhealthy and unproductive responses to stressors. Each model emphasizes a different aspect of stress. The stress model according to Potter & Perry (2017) include:

1. Stress model based on response This stress model deals with specific responses or response patterns that may indicate a stressor.
2. Stress model based on stimulus

This stress focuses on disturbing characteristics in the environment.

Classical research identifying stress as a stimulus has resulted in the development of a social adjustment scale, which measures the effect of major life events on illness. This stimulus-based model focuses on the following assumptions:

- a. Changing events in life are normal and these changes require the same type and duration of adjustment.
- b. Individuals are passive responses to stress, and their perception of events is irrelevant.
- c. Everyone has the same stimulus threshold.

### 3. Stress model based on transaction

This stress model views the individual and the environment in a dynamic and interactive relationship. This model focuses on processes related to stress such as cognitive assessment and coping.

#### 2.2.6 Response to Stress

Individuals as a whole are involved in responding to and adapting to stress. However, most of the research on stress focuses on physiological and psychological responses, although these dimensions overlap and interact with other dimensions. When there is stress, a person uses physiological and psychological energy to respond and adapt. The amount of energy required and the effectiveness of efforts to adapt depend on the intensity, scope and duration of the other stressor. The kinds of responses to stress according to Potter & Perry (2017) are:

##### 1. Physiological response

In this physiological response to stress, two types of local adaptation syndrome (LAS) and general adaptation syndrome (GAS) have been identified.

a. local adaptation syndrome (LAS) is the response of tissues, organs or body parts to stress due to trauma, disease, or other physiological changes. An example of LAS is Examples of LAS are the pain reflex response and the inflammatory response. The characteristics of LAS are adaptive responses and do not involve all body systems, requiring stressors to stimulate them.

b. General adaptation syndrome (GAS) is a defense response of the whole body to stress. This response is several body systems, especially the autonomic nervous system of the endocrine system.

## 2. Psychological response

Exposure to stressors results in psychological and physiological adaptive responses. When a person is exposed to a stressor, their ability to meet their blood needs is impaired. These distractions or threats can lead to frustration, anxiety, and tension. Individual psychological adaptive behavior helps a person's ability to deal with stressors. These behaviors are directed at managing stress and are acquired through learning and experience as individuals identify acceptable behaviors.

### 2.2.7 Stages of Stress

Sunaryo (2017) states that the stages of stress are divided as follows:

#### 1. Stress stage I

This is the stage of the lightest stress and is usually accompanied by feelings of great enthusiasm for work and excess.

#### 2. Stress Stage II

In this stage the effects of stress that were originally pleasant begin to disappear and complaints arise due to insufficient energy reserves energy reserves are no longer sufficient throughout the day. Complaints that are often raised are feeling tired when you wake up in the morning that should feel fresh, feeling tired in the late afternoon, feeling tired easily after eating, unable to relax (relax), stomach or stomach discomfort, heart beats harder and pounding. palpitations, neck and back muscles tense.

### 3. Stress Stage III

If a person continues to force himself and ignores the complaints that are felt, then the person concerned will show increasingly real and disturbing complaints, namely stomach and intestinal disorders that are increasingly real (eg complaints of ulcers, irregular bowel movements), muscle tension will increase. felt, feeling uneasy and increasing emotional tension, disturbed sleep patterns (insomnia), disturbed body coordination (body feels unsteady and feels like passing out). At this stage, a person must consult a doctor to get therapy or reduce stress so that the body has the opportunity to rest in order to increase the supply of energy that is experiencing a deficit.

### 4. Stage IV Stress

Not infrequently a person when checking himself to a doctor in connection with complaints of stage III stress by a doctor is declared not sick because there are no physical abnormalities found in his

organs. If this happens and the person concerned continues to push himself, then the symptoms of stage IV stress will appear, unable to work all day (sluggish), work activities are difficult and boring, inadequate response, disrupted routine activities, disturbed sleep patterns accompanied by dreams. stressful dreams, often refuses invitations because they are not enthusiastic and not passionate, concentration and memory decline, fear and anxiety arise.

#### 5. Stage V Stress

If the situation continues, then a person will fall into stage V stress which is characterized by increasing physical and mental fatigue profound, inability to complete light and simple daily work, digestive system disorders are getting worse, feelings of fear and anxiety are increasing, confused and panicked.

#### 6. Stress Stage VI

This stage is the climax stage, a person experiences panic attacks and feelings of fear of death. Not infrequently people who experience this stage of stress are repeatedly brought to the ER and even to the ICU, although in the end they are sent home because there are no physical abnormalities in the organs. The picture of stress at this stage: very hard heart palpitations, shortness of breath, body shaking and cold sweats, sluggish and faint (collapsed).

### 2.2.8 Stress Levels

Stress levels are divided into three Stress levels are divided into three according to (Hartanti, 2016), including:

## 1. Normal

Stress Normal stress is a natural part of life for example feeling a louder heartbeat after an activity which might be a chore, fear of not passing an exam.

## 2. Mild stress

If the stressors faced by everyone are regular, for example too much sleep, traffic jams. Situations like this usually last a few minutes or hours and have no effect on the physical and mental just starting to get a little tense and anxious.

## 3. Moderate stress

If it lasts longer, from a few hours to several days, for example unfinished deals, excessive workloads and expecting a new job. In this medium, the individual begins to have difficulty sleeping and is often aloof and tense.

## 4. Severe stress

If a chronic situation that can last from a few weeks to several years, for example a husband and wife relationship that is not harmonious, financial difficulties and long physical illness. In this severe stress, the individual has started to have physical and mental disorders.

## 5. Heavy Stress

This stressful situation leads to depression. It can be said to be very severe, this alignment is running continuously without a healing process so it can cause disease risk.

### 2.2.9 Impact of Stress

When stress occurs, your body releases stress hormones, namely adrenaline, cortisol, and norepinephrine, which cause an increase in heart rate and stronger heart muscle contractions. The blood vessels that carry blood to the heart also dilate, increasing the amount of blood pumped.

Stress can affect health in two ways, first the changes caused by stress directly affect the physical system of the body that can affect health. Second, stress indirectly affects individual behavior so that it causes disease or worsens existing conditions. The condition of this stress consists of several symptoms according to Manurung (2017), including:

1. Biological symptoms

There are several physical symptoms that are felt when a person is under stress including excessive headaches, poor sleep, indigestion, loss of appetite, skin disorders, and excessive sweating throughout the body.

2. Symptoms of cognition

Impaired memory (decreased memory and easy to forget things), lack of attention and concentration so that a person does not focus on doing something.

3. Emotional symptoms

Such as irritability, excessive anxiety about everything, feeling sad and depressed.



### 2.2.10 Stressed Personality Type

The various types of stress personality which are divided into two parts according to Hawari (2018) include:

1. Personality type A describes, among others, the following characteristics:

a. Ambitious, aggressive and comparative (likes competition), many dual positions.

b. Lack of patience, easily tense, irritable and angry (emotional).

c. Excessive vigilance, strong self-control, overconfidence.

d. How to talk fast, act fast, hyperactive, can't stay still.

e. Work knows no time (workaholic).

f. Good at organizing, leading and governing (authoritarian)

g. Prefers to work alone when there is a challenge

h. Unable to calm down (not relaxed), all in a hurry

i. Easy to get along with (friendly), good at generating feelings of empathy and if not achieved it's easy to be hostile

j. Not easily influenced, rigid (not flexible)

2. The B personality type describes, among others, the following characteristics:

a. Ambition is natural, not aggressive and healthy in competence and not forcing yourself

b. Patient, calm, not easily offended, and not easily angered (emotions under control)

- c. Alertness is within reasonable limits as well as self-control and self-confidence is not excessive
- d. How to speak unhurriedly, act at the right time, behavior is not hyperactive
- e. Can manage time at work (taking time to rest)
- f. Prefer to cooperate and not push yourself when facing challenges
- g. In controlling everything, you are able to hold and control yourself

#### 2.2.11 Stress Level Assessment Instrument

Stress level is an assessment of the stress severity experienced by a person. This stress level is measured using Depression Anxiety Stress Scale 21 (DASS 21) by Lovibond (Osman et al., 2012). Psychometric Properties of the Depression Anxiety Stress Scale 21 (DASS 21) consists of twenty-one statements of seven each to assess depression, anxiety and stress (Indira, 2016). DASS 21 was designed not only to conventionally measure emotional status, but also to further process the understanding and measurement of any applicable emotional status. It is usually described as stress and this questionnaire already available in bahasa Indonesia version. DASS 21 can be used either by groups or individuals for research purposes.

The stress levels on the instrument are normal, mild, moderate, severe and very heavy. Psychometric Properties of The Depression Anxiety Stress Scale 21 (DASS 21) consists of 21 items including:

- a. The depression scale is in question numbers: 3, 5, 10, 13, 16, 17, 21
- b. The anxiety scale is in question number: 2, 4, 7, 9, 15, 19, 20

c. The stress scale is in question numbers: 1, 6, 8, 11, 12, 14, 18

This study only chooses a questionnaire that measures stress, namely 7 questions. And the items from the Depression Anxiety Stress Scale (DASS 21) question are:

1. (s) I found it hard to wind down
2. (a) I was aware of dryness of my mouth
3. (d) I couldn't seem to experience any positive feeling at all
4. (a) I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion.
5. (d) I found it difficult to work up the initiative to do things
6. (s) I tended to over-react to situations
7. (a) I experienced trembling (e.g. in the hands)
8. (s) I felt that I was using a lot of nervous energy
9. (a) I was worried about situations in which I might panic and make a fool of myself
10. (d) I felt that I had nothing to look forward to
11. (s) I found myself getting agitated
12. (s) I found it difficult to relax
13. (d) I felt down-hearted and blue
14. (s) I was intolerant of anything that kept me from getting on with what I was doing
15. (a) I felt I was close to panic
16. (d) I was unable to become enthusiastic about anything(d) I felt I wasn't worth much as a person

17. (s) I felt that I was rather touchy
18. (a) I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)
19. exertion (e.g. sense of heart rate increase, heart missing a beat)
20. (a) I felt scared without any good reason
21. (d) I felt that life was meaningless

Table 2.2 Depression Anxiety Stress Scale 21 (DASS 21) score :

	<b>Depression</b>	<b>Anxiety</b>	<b>Stress</b>
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Heavy	>28	>20	>34

### 2.3 Relationship Between Stress Level and Blood Pressure in hypertension patients

Hypertension is a disease related to human blood pressure. Smeltzer and Bare (2018), define hypertension as persistent blood pressure where the systolic pressure is above 140 mmHg and the diastolic pressure is above 90 mmHg. Factors that cause recurrence of hypertension are diet can affect recurrence of hypertension, so it is necessary to regulate eating for people with hypertension such as limiting sodium intake, both from table salt and from foods containing high sodium, reducing consumption of foods containing cholesterol, increasing consumption of foods containing dietary fiber.

The second factor is the stress factor is the reality of everyday life that cannot be avoided, stress or emotional tension can affect the cardiovascular

system, especially hypertension, and stress is believed to be a psychological factor that can increase blood pressure.

Stress is also believed to have a relationship with hypertension. This is thought to be through the sympathetic nerves which can increase blood pressure intermittently. If stress lasts for a long time, it can result in persistently high blood pressure. One of the tasks of the sympathetic nerves is to stimulate the release of the hormone adrenaline. This hormone can cause the heart to beat faster and cause constriction of peripheral blood capillaries. This can lead to an increase in blood pressure (Muhammadun, 2018).

According to Sugiharto (2017) someone with mental stress experiences hypertension. Stress conditions increase sympathetic nerve activity which then increases blood pressure gradually, meaning that the more severe a person's stress condition is, the higher his blood pressure will be. Stress is the fear and anxiety of a person's feelings and body against changes in the environment. If there is something that threatens physiologically, the pituitary gland of the brain will send the endocrine glands into the blood, this hormone has a function to activate the hormones adrenaline and hydrocortisone, so that the body can adjust to the changes that occur. Naturally in this condition a person will feel a faster heart rate and cold sweat flowing in the nape area. In addition, increased blood flow to skeletal muscles and decreased blood flow to the kidneys, skin, and digestive tract can also occur due to stress.

Stress conditions that make the body produce more adrenaline hormones, making the heart work stronger and faster. If it occurs for a long period of time, a series of reactions will arise from other body organs.

Functional changes in blood pressure caused by stressful conditions can cause cardiovascular hypertrophy if repeated intermittently. Likewise, the stress experienced by people with hypertension will affect the increase in blood pressure which tends to stay or can even increase, causing the condition of hypertension to become more severe (Lawson, 2017).

Blood pressure levels occur due to changes in the structure of blood vessels such as reduced elasticity of blood vessels and stiffness in the walls of blood vessels resulting in narrowing of blood vessels resulting in blood flow to tissues and organs and an increase in blood pressure.

Aspects of stress include biological aspects and psychological aspects. The biological aspect of each person facing a certain condition that is threatening and dangerous for himself can lead to physiological reactions in the body to stress, such as a fast heart rate.

Another physiological reaction according to Yumba (2018) is characterized by a person's behavior such as cold and sweaty left hand. Biological aspects include cognitive, emotional and social behavior. Stress will interfere with cognitive function by distracting the individual. Cognitive relates to memory, difficulty and concentration, forgetfulness and the inability to solve problems.

Yosep (2018) revealed that stress that occurs can trigger blood pressure levels, stress will increase if peripheral blood vessels and cardiac output increase so that it stimulates the sympathetic nerves so that stress will react and an increase in blood pressure will occur. Prevention of stress levels by increasing blood pressure by positive attitudes, beliefs, controlling emotions,

being flexible, rational and adaptive towards others and developing efficient attitudes to reduce stress experienced and do relaxation.



## 2.4 Synthesize Table

**Table 2.3 Synthesize Of Stress Levels And Blood Pressure**

Number	Title, Author And Year	Method ( Desain, Sample, Variable, Instrument, Analysis)	Result	Conclusion
1.	Stress Level Relationship With Blood Pressure in Hypertension Patients (Jalaluddin Abdul Ghoni, Binarti Dwi Wahyuningsih, 2021)	<p><b>Desain:</b> The design used is analytic correlation with approach cross sectional</p> <p><b>Sample:</b> <i>n</i>: 271 respondents (all categories)</p> <p><b>Variable:</b> Independent Variable : Stress Level, Dependent Variable : Blood Pressure</p> <p><b>Instrument:</b> using a stress scale depression questionnaire (DASS 42) and a digital sphymomanometer</p> <p><b>Data analysis:</b> In This Research Using test Spearmen Rho stats</p>	<p>The results showed almost half of hypertensive patients have mild stress levels with blood pressure high normal, mild hypertension, and moderate hypertension. By using test Spearmen Rho statistic results obtained value <math>(0.000) &lt; \alpha (0.05)</math></p>	<p>there is a relationship between stress levels and blood pressure hypertensive patients. If the stress level is normal, the pressure tends to be normal blood pressure and the higher the stress level in the moderate category, the higher the blood pressure can also be in the category of moderate hypertension. Stress levels managed with both by paying attention to the causative factors can stabilize the pressure Blood levels are normal so that there are no serious</p>



				complications from rising blood pressure blood.
2.	Factors Affecting Stress On Hypertension Patients At Dau Tour Health Center (Astri. Kusuma, F.H.D. & Widiani, 2018)	<p><b>Desain:</b> The design used is correlational using the approach</p> <p><b>Sample:</b> <i>n</i>: 102 respondents (all categories)</p> <p><b>Variable:</b> Independent Variable : Stress Level, Dependent Variable : Blood Pressure</p> <p><b>Instrument:</b> using a stress scale depression questionnaire (DASS 21) and a manual sphygmomanometer and stethoscope</p> <p><b>Data analysis:</b> chi-square test</p>	The results showed that there was an influence of personality factors, cognitive factors and environmental factors on stress in hypertensive patients at the Dau Tourism Health Center Malang, and environmental factors are more dominant influence on stress by 74.9% and there is an influence of environmental factors on stress in hypertensive patients sig value -0.006 (< 0.050) which means the data is declared significant and H1 is accepted, meaning There is an influence of environmental factors on stress in hypertensive patients at the Tourism Health Center Poor Dao.	<ol style="list-style-type: none"> <li>1. There is a significant influence Personality factor against stress</li> <li>2. Environmental factors are more dominant affect stress</li> <li>3. Environmental factors influence against stress</li> <li>4. Cognitive factors affect stress,</li> </ol>

3.	The Level Anxiety With Hypertension In Outpatient Health Center (Idayati, 2018)	<p><b>Desain:</b> Research design using a cross sectional approach</p> <p><b>Sample:</b> <i>n</i>: 37 respondents (all categories)</p> <p><b>Variable:</b> Independent Variable : Anxiety Level, Dependent Variable : incidence of hypertension</p> <p><b>Instrument:</b> using a anxiety scale depression questionnaire (DASS 42) and a digital sphygmomanometer and stethoscope</p> <p><b>Data analysis:</b> Chi Square Test</p>	<p>The results of the study show that there is a relationship level of anxiety with the incidence of hypertension in outpatients at the health center Pringsewu District Pringsewu 2016 (p value 0.017). Advice to nurses so that can make appropriate interventions on patients so as to reduce the level of patient anxiety that can affect increase in blood pressure</p>	<p>There is a relationship between the level of anxiety and incidence of hypertension in hospitalized patients Pringsewu District Health Center road Pringsewu Year 2016</p>
4.	The Relationship Of Stress Level And Family History With Hypertension in Outcome Patients In The Work Area Of Puruk Cahu Health Center Great Year 2021 (Anisa, Fahrurazi, & Hilda 2021)	<p><b>Desain:</b> The research used is Analytical Survey research using a Cross-Sectional approach</p> <p><b>Sample:</b> <i>n</i>: 89 respondents (all categories)</p> <p><b>Variable:</b> Independent Variables : stress level and family history, Dependent Variable : hypertension</p> <p><b>Instrument:</b> using a stress scale depression questionnaire (DASS 21) and a digital sphygmomanometer and stethoscope</p> <p><b>Data analysis:</b> Chi Square Test</p>	<p>The results of this study indicate that there is a relationship between stress levels and the incidence of hypertension as many as 28 respondents (60.9%) experienced mild hypertension with mild and moderate stress. Meanwhile, 16 respondents (34.8) % experienced moderate hypertension with mild and moderate stress</p>	<p>There is a significant relationship between stress levels and the incidence of hypertension. Based on the chi square test with p-value = 0.000 at the Puruk Cahu Murung Raya Health Center in 2021. There is a relationship</p>

			<p>between family history and the incidence of hypertension. Based on the chi square test with a p-value = 0.000 at the Puruk Cahu Murung Raya Public Health Center in 2021.</p>
<p>5. Relationship between stress and blood pressure in the elderly with hypertension in the work area Puskesmas Kadungora Garut (Sumarni et al., 2019)</p>	<p><b>Desain:</b> The design used is descriptive correlation with cross sectional method  <b>Sample:</b> <i>n</i>: 116 respondents (elderly)  <b>Variable:</b> Independent Variables : stress  Dependent Variable : blood pressure  <b>Instrument:</b> using a stress scale depression questionnaire (DAAS 21) and a manual sphygmomanometer and stethoscope  <b>Data analysis:</b> Chi-quare Test</p>	<p>This study has a relationship between stress and blood pressure in the elderly and it was found that 32 elderly were in the category of normal stress levels (27.6%), low stress levels in 45 elderly (38.8%), moderate stress levels in 29 elderly (25.0%), and high stress levels in 10 elderly (8.6%). The results of the blood pressure examination were 130-139 mmHg/80-89 mmHg in 30 elderly (25.9%), 140 mmHg/≥90 mmHg in 79 elderly (68.1%) and 180 mmHg/≥120 mmHg in 7 elderly (6.0%)</p>	<p>Conclusion: From the results of the analysis there is a significant relationship between stress on blood pressure in the elderly, a significance value (0.024 (p value 0.05 .) was found, which means it shows a significant effect and thus H1 can accept that there is a significant correlation between stress and anxiety). and blood pressure in the elderly with hypertension in the working area of the Kadungora Health</p>

				Center, Garut Regency
6.	The Relationship Of Stress Level With Pressure Level Blood In The Elderly (Tyas & Zulfikar, 2021)	<p><b>Desain:</b> The design used is correlational with a cross section approach</p> <p><b>Sample:</b> <i>n</i>: 76 respondents (elderly)</p> <p><b>Variable:</b> Independent Variables : stress level Dependent Variable : blood pressure</p> <p><b>Instrument:</b> Questionnaire (DASS 42) and sphygmomanometer and stethoscope</p> <p><b>Data analysis:</b> Chi-quare Test</p>	the results showed that the value of $p = 0.027$ and a significant level of $0.05$ also obtained $p < 0.05$ , meaning that there is a relationship between stress levels and levels of blood pressure in the elderly.	Conclusion in this study that there is a relationship between stress levels and levels of blood pressure in the elderly due to stress levels, a condition where the body's condition is disturbed due to pressure Psychological and stress can trigger hormones in the body that control a person's mind Stress can increase blood pressure even more.
7.	The Relationship Of Stress Level On Blood Pressure In Medicine Age In Village Catches Ngawi Regency (Pudjijuniarto, Irfan 2021)	<p><b>Desain:</b> The design of this research is Correlational Descriptive with Cross . Approach sectional.</p> <p><b>Sample:</b> <i>n</i>: 51 respondents (middle age)</p> <p><b>Variable:</b> Independent Variables : stress level Dependent Variable : blood pressure</p> <p><b>Instrument:</b> Questionnaire DASS 21 and sphygmomanometer and stethoscope</p> <p><b>Data analysis:</b> Chi-quare Test</p>	The results showed that there was a relationship between stress levels and blood pressure in middle age and showed that stress levels in middle age were more moderate (82.4%) and systolic blood pressure in middle age with an average of 127 mmHg and diastolic blood pressure. mean	there is a significant relationship between stress levels and blood pressure in middle age in Katikan Village, Ngawi Regency, the correlation value of Tau_b Kendall is 0.419 and Sig. There is a fairly

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blood pressure is 83 mmHg. close and significant relationship between stress levels and blood pressure, with a correlation coefficient of 0.419 and Sig. (2-tailed) of 0.001

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**CHAPTER 3**  
**CONCEPTUAL FREAMWORK AND HYPOTHESIS**

**3.1 Conceptual Freamwork**

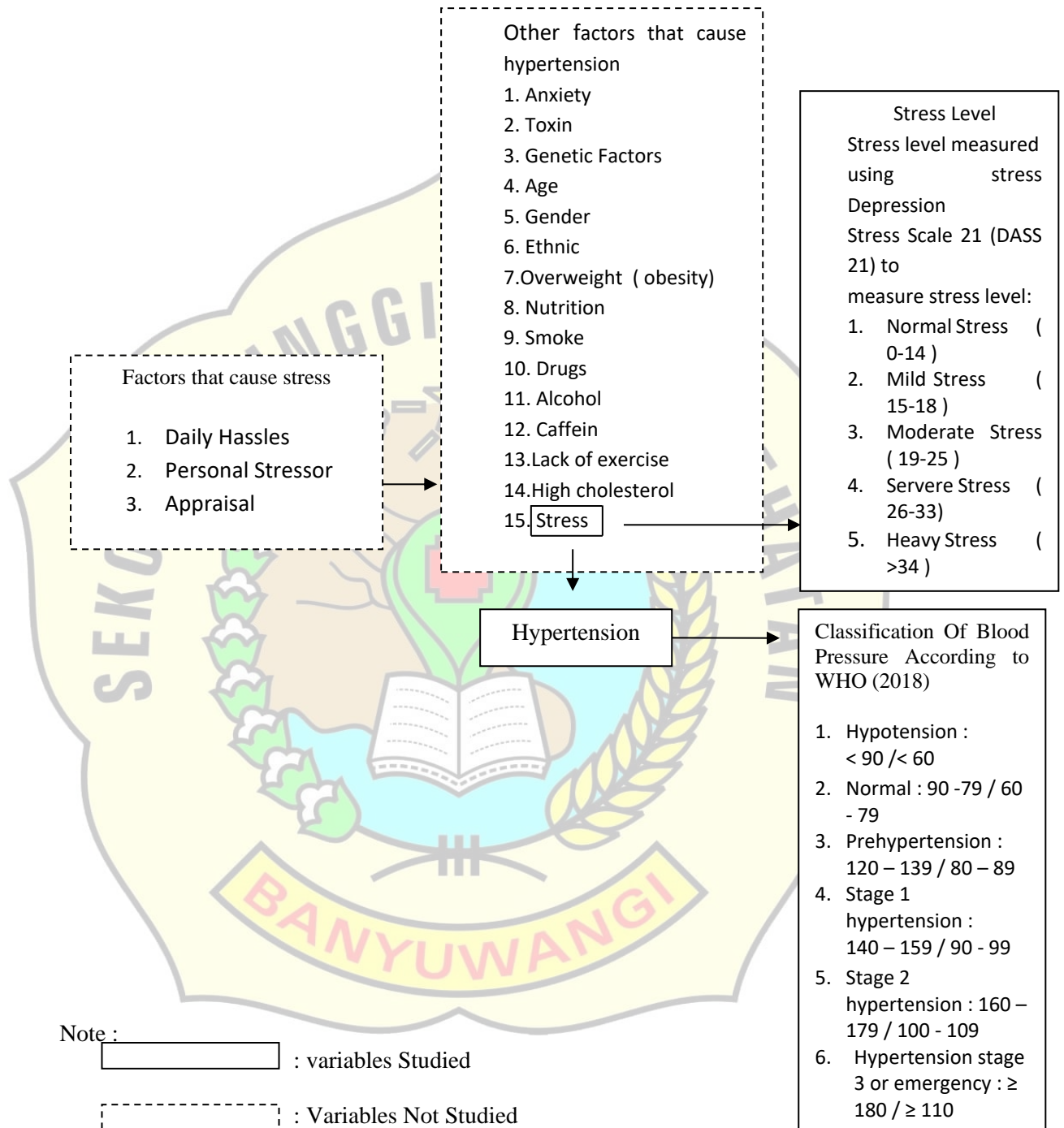


Figure 3.1 Conceptual Framework Of The Correlation Between Stress Levels And Blood Pressure In Patients With Hypertension At The Working Area of The Klatak Public Health Center In 2022.

### 3.2 Hypothesis

Hypotesis is a temporary answer to the formulation of a problem or research question. Hypoteses are arranged before the research is carried out because hypoteses can provide clues at the stages of data collection, analysis, and interpretation. Hypotesis testing means to conclude a science through a scientific test and question or relationship that has been carried out by previous research (Nursalam, 2016).

The hypothesis in this study is that there is a the correlation between stress levels and blood pressure in patients with hypertension at the working area of klatak public health center in 2022.



## **CHAPTER 4**

### **RESEARCH METHODS**

#### **4.1 Research Design**

Research design is a strategic framework for action that serves as a bridge between research questions and the execution, or implementation of the research strategy (Leedy & Ormrod, 2018). Research design is very important in research which allows maximizing control of several factors that can affect the accuracy of result. The research design is the end result of a stage of decisions made by the researcher regarding how the research can be applied (Nursalam, 2017).

This study uses correlational research with an instrument in the form of a questionnaire DASS 21, while the research design that will be used is cross sectional as revealed by Nursalam (2017), the type of research that is measured/observed is only once on the data. on the independent and dependent variables.

#### **4.2 Population, Sample and Sampling Technique**

##### **4.2.1 Population**

The population is the subject (eg humans; clients) who meet predetermined criteria (Nursalam, 2017). The population in this study were all hypertension sufferers in the working area of the Klatak Health Center in 2022 in the vulnerable months of February 2022 N = 40 respondents.



#### 4.2.2 Sample

The sample is part of the population selected to participate in research, it is a small part of the whole, selected to participate in the research project (Polit, D., & Hungler, 2018). The sample in this study were some people who suffered from hypertension in the working area of the Klatak public Health Center in 2022 N= 30 respondents

##### 4.2.2.1 Sample size

The sample size in this study was calculated using the following formula:

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

Note :

n : Sample size

N : Population size

d : level of significance ( selected error rate, d = 0,05)

##### 4.2.2.2 Inclusion Criteria

Inclusion criteria are general characteristics of research subjects of the target population that is achieved and will be studied (Nursalam, 2017). Based on this research, the inclusion criteria are:

1. Patients with hypertension who live in the Klatak area
2. people who suffer from hypertension are willing to be reseach respondents
3. Can read and write

#### 4.2.2.3 Exception Criteria

Exclusion criteria are eliminating/removing subjects that meet the research inclusion criteria for various reasons (Nursalam, 2017). Based on this study, the inclusion criteria were:

1. In critical condition disease
2. Patients who have had a stroke

#### 4.2.3 Sampling

Technique Nursalam (2017) said sampling is the process of selecting a portion of the population to represent the population. Sampling techniques are the methods taken in taking a sample in order to obtain a sample that is truly in accordance with the overall object of research.

In this study using accidental sampling technique. Is a sampling technique by selecting a sample among the population in accordance with what the researcher wants (objective/research problem). So that the sample can represent previously known population characteristics

### 4.3 Framework

The framework is the stages or steps in scientific activities carried out in conducting research ranging from initial to final activities (Nursalam, 2017).

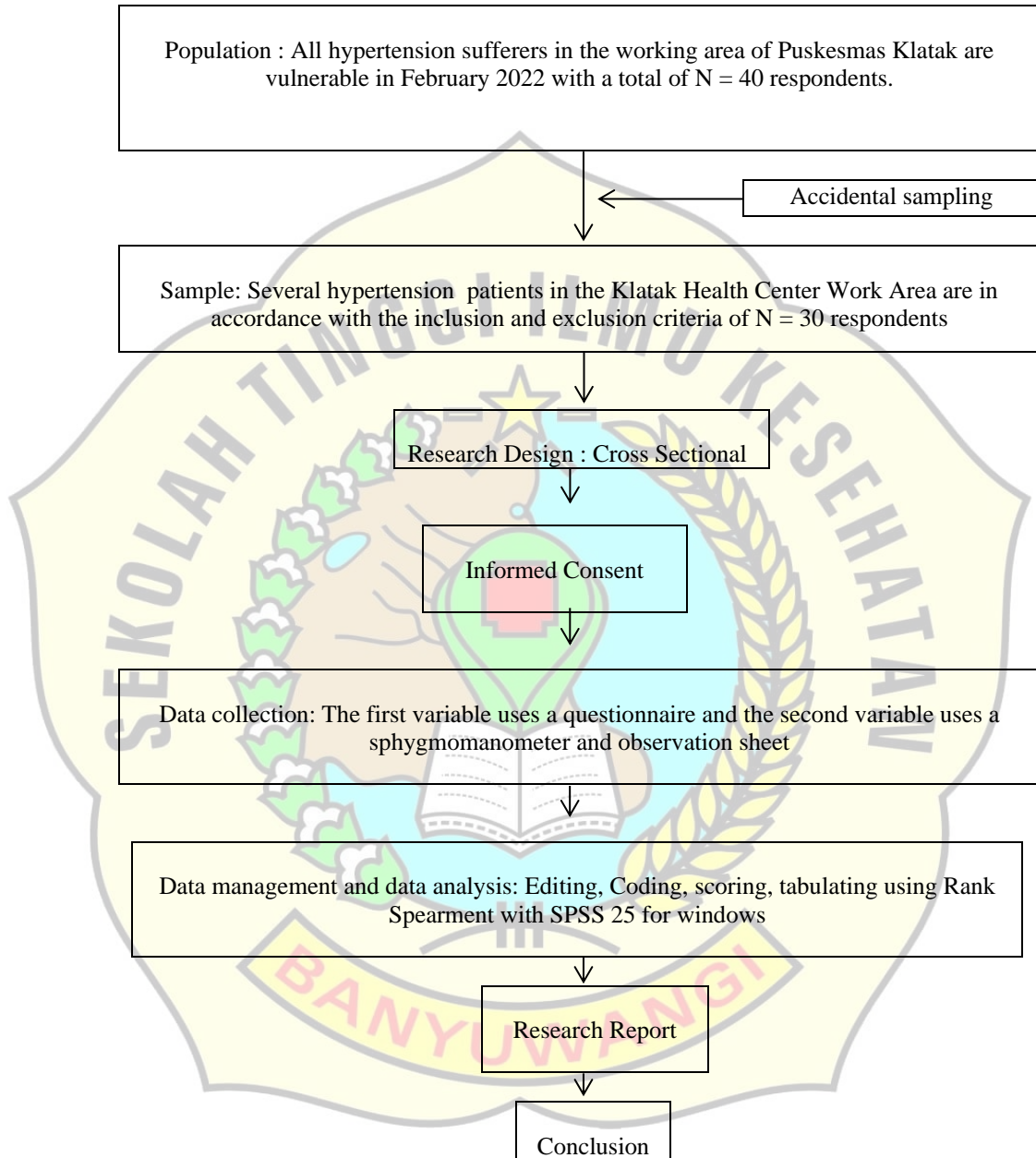


Figure 4.3 Framework For The Correlation Between Stress Levels And Blood Pressure In Patients With Hypertension At The Working Area Of The Klatak Public Health Center In 2022.

### 4.4 Variable Identification

Variables are concepts from various abstract levels which are defined as a facility for measuring and or manipulating a study (Nursalam, Nursing Research Methodology, 2017). The variables in this study are:

#### 4.4.1 Independent Variable (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 (Nursalam, Nursing Research Methodology, 2017). The independent variable in this study is the level of stress

#### 4.4.2 Dependent Variable (Related 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. This dependent variable is a factor that is observed and measured to determine whether there is a relationship or influence of the independent variable (Nursalam, Nursing Research Methodology, 2017). The dependent variable in this study is Blood Pressure

### 4.5 Operational Definition

Operational Definition is a definition based on observed (measured) characteristics. Observable means enabling researchers to make careful observations or measurements of an object or phenomenon which can then be repeated by others (Nursalam, Nursing Research Methodology, 2017).

Table 4.1 Operational Definition: The Correlation Between Stress Levels And Blood Pressure In Patients With Hypertension At The Working Area of The Klatak Public Health Center In 2022.

Variable	Operational Definition	Indicator	Measuring Instrument	Scale	Score
Independent Variables : Stress level	Stress is a process that assesses a something that is threatening, or dangerous and the individual responds to the event on a physiological, emotional, cognitive and behavioral level.	Stress indicator in <i>Depression Anxiety Stress Scale</i> 21 (DASS21) is formed to measure negative emotional status: 1) Difficulty relaxing 2) Nervous arousal 3) Easily upset or agitated 4) Impatient	DASS 21 Questionnaire	Ordinal	Normal : 0 - 14 Mild : 15 -18 Moderate : 19 -25 Severe : 26 – 33 Heavy : >34
Dependent Variable : Blood pressure	The pressure that occurs on the walls of the arteries of the blood vessels when blood is pumped from the heart. Measurements are made on the left or right arm according to the respondent's position	Systolic blood pressure and diastolic blood pressure	Sphygmomanometer and stethoscope Measurement results are recorded on the observation sheet in mmHg	Ordinal	1. Hypotension : < 90 / < 60 mmHg 2. Normal : 90 -79 / 60 – 79 mmHg 3. Prehypertension : 120 – 139 / 80 – 89 mmHg 4. Stage 1 hypertension : 140 – 159 / 90 – 99 mmHg 5. Stage 2 hypertension : 160 – 179 / 100 – 109 mmHg 6. Hypertension stage 3 or emergency : ≥ 180 / ≥ 110 mmHg

#### 4.6 Data Collection and Data Analysis

Data collection is a process of approaching the subject and collecting the characteristics of the subject required in a study (Nursalam, 2017).

#### 4.6.1 Research Instruments

Research instruments are tools or facilities used in collecting so that work is easier and the results are better, in the sense of being more accurate, complete, and systematic so that they are easier to process. Variations in the types of research instruments used in nursing can be classified into 5 parts which include; measurement, biophysiology, observation, interview, questionnaire, and scale (Nursalam, Nursing Research Methodology, 2017).

The instruments used in this research are:

Stress level questionnaire and DASS 21 and blood pressure was measured using a sphygmomanometer and stethoscope.

#### 4.6.2 Research Sites

This research was conducted in the Working Area of the Klatak Health Center.

#### 4.6.3 Research Time

This research was carried out in the working area of the Klatak Health Center in 22<sup>th</sup> to 25<sup>th</sup> of march 2022

#### 4.6.4 Data Collection Process

Data collection is a subject approach process and the process of collecting subject characteristics needed in a study (Nursalam, Nursing Research Methodology, 2017). The data collection method in this study is the first by using a questionnaire method, using the DASS 21

questionnaire given to respondents and the second observing by measuring blood pressure to respondents using a sphygmomanometer and a stethoscope.

#### 4.6.5 Data Processing

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, Nursing Research Methodology, 2017). Before performing data analysis, the data that has been successfully collected in succession will undergo an editing process, namely coding, scoring, and tabulating.

##### 1. Editing

Attempts to re-check the correctness of the data obtained or collected. Editing can be done at the data collection stage or after the data has been collected (Nursalam, Nursing Research Methodology, 2013).

##### 2. Coding

Coding is coding on data intended to translate data into codes which are usually in the form of numbers (Nursalam, 2013).

##### a. Coding Stress level:

Normal	: 0
Mild	: 1
Moderate	: 2
Severe	: 3
Heavy	: 4

b. Coding blood pressure

Hypotension	: 0
Normal	: 1
Prehypertension	: 2
Stage 1 hypertension	: 3
Stage 2 hypertension	: 4
Hypertension stage 3 or emergency	: 5

3. Scoring

Scoring is the score / value of each question item to determine the highest and lowest scores (Setiadi, 2007). At the scoring stage, the researcher assigns a value to each data according to a predetermined score based on a checklist that has been filled out by the respondent.

a. Stress Levels Scoring

Normal	: 0 – 14
Mild	: 15 – 18
Moderate	: 19 – 25
Severe	: 26 – 33
Heavy	: >34

b. Blood pressure score

Hypotension	: < 90 / < 60 mmHg
Normal	: 90 - 79 / 60 – 79 mmHg
Prehypertension	: 120 – 139 / 80 – 89 mmHg
Stage 1 hypertension	: 140 – 159 / 90 – 99 mmHg
Stage 2 hypertension	: 160 – 179 / 100 – 109 mmHg



Hypertension stage 3 or emergency : 180 / 110 mmHg

#### 4. Tabulating

Tabulation is the presentation of data in the form of a table consisting of several rows and several columns. Tables can be used to present several variables from observations, surveys or research at the same time so that the data is easy to read and understand (Nursalam, 2013).

#### 4.6.6 Statistical analysis

Data that has been collected is then analyzed on the relationship between stress levels and blood pressure in patients with hypertension using an ordinal scale, after the data is collected, it will be processed using the relevant statistical test, namely the Spearman rank test. to determine the relationship between the independent variable and the dependent variable with ordinal data scale. and ordinal, using a contingency table using SPSS 25 for Windows. If the value obtained in the statistical test shows a p value  $<0.05$  then there is a significant the correlation between stress levels and blood pressure in hypertensive patients in other words  $H_0$  is rejected, whereas if  $p \geq 0.05$  means  $H_0$  is accepted or there is no significant the correlation between stress levels with blood pressure in hypertensive patients.

to provide an interpretation of the correlation coefficient, then the author uses guidelines that refer to (Sugiyono, 2014) as follows: Table

#### 4.2 Interpretation of correlation values

Correlation Value	Interpretation
0.00-0.199	Very low

0.20-0.399	Low
0.40-0.599	Moderate
0.60-0.799	Strong
0.80-1.00	Very strong

#### 4.6.7 Data Interpretation

According to Arikunto (2014) interpret the scale of frequency distribution is as follows:

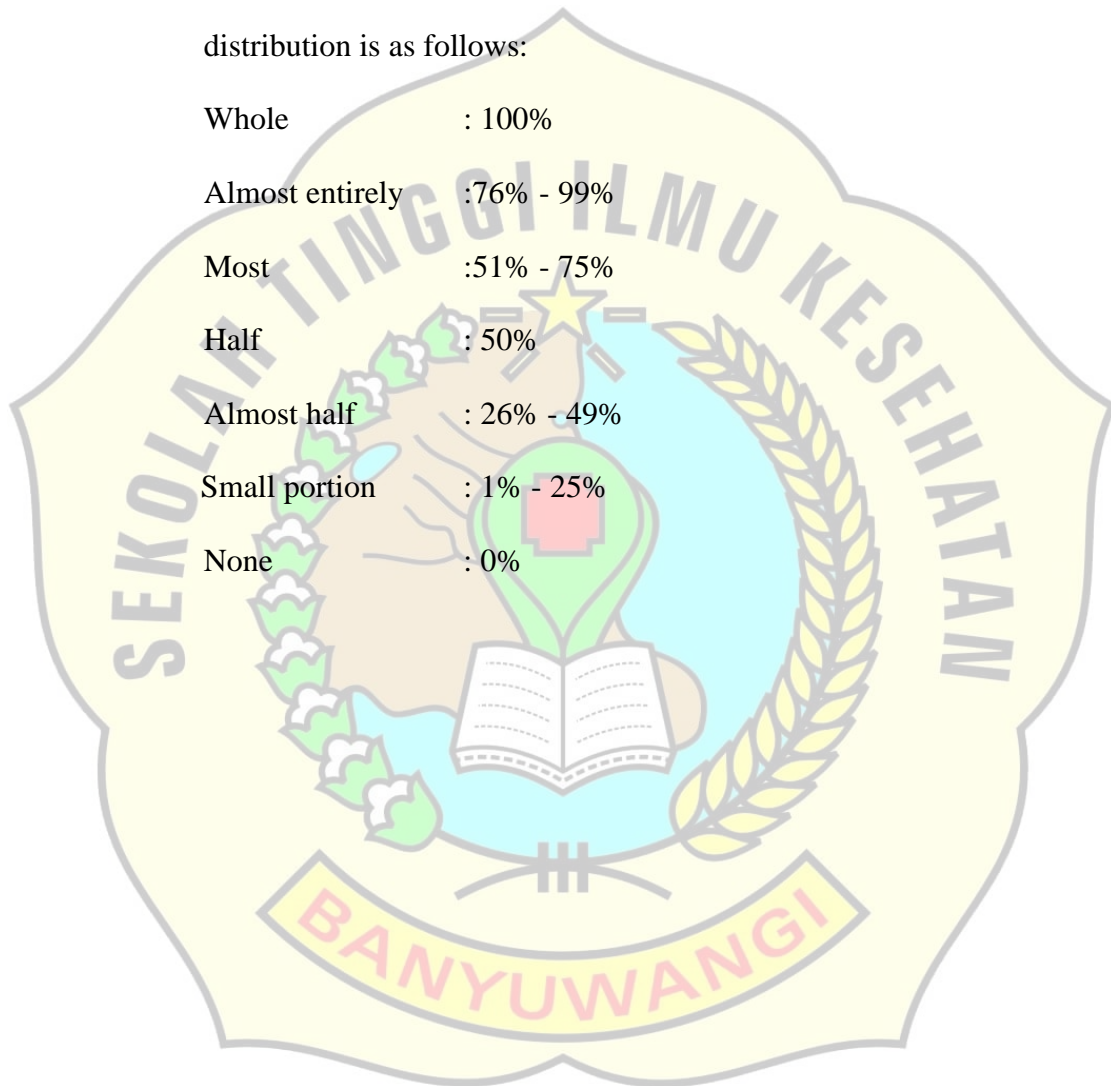


Table 4.3 The method of analysis for independent variable and dependent variable.

Data analysis technique	Aim	Variable	Measuring scale	Statistical approach
Univariate analysis	Identify Demographic	1. Genetic Factors 2. Age 3. Gender	Nominal Rasio nominal	Descriptive Statistics

	Variable Data	<ul style="list-style-type: none"> <li>4. Ethnic</li> <li>5. Overweight (Obesity)</li> <li>6. Smoke</li> <li>7. Drugs</li> <li>8. Alcohol</li> <li>9. coffee</li> <li>10. Lack Of Exercise</li> <li>11. Profession</li> <li>12. Income level</li> <li>13. Religion</li> <li>14. Living together</li> <li>15. Disease history</li> <li>16. Level education</li> <li>17. Medication adherence</li> <li>18. Illness</li> </ul>	<ul style="list-style-type: none"> <li>Nominal</li> <li>Ordinal</li> <li>Nominal ordinal</li> <li>Rasio</li> <li>Nominal</li> <li>Nominal</li> <li>Nominal</li> <li>Ordinal</li> <li>Nominal</li> <li>Nominal</li> <li>Ordinal</li> <li>Ordinal</li> <li>Ordinal</li> <li>Ordinal</li> </ul>	
Bivariate analysis	The Correlation Between Stress Levels And Blood Pressure In Patients With Hypertension At The Working Area Of Klatak Public Health Center In 2022	<p>Stress Level stress Depression Stress Scale 21 (DASS 21)</p> <ul style="list-style-type: none"> <li>1. Normal Stress ( 0-14 )</li> <li>2. Mild Stress ( 15-18 )</li> <li>3. Moderate Stress ( 19-25 )</li> <li>4. Servere Stress ( 26-33 )</li> <li>5. Heavy Stress ( &gt;34 )</li> </ul> <p>Blood Pressure According to WHO (2018)</p> <ul style="list-style-type: none"> <li>1. Hypotension : <math>&lt; 90 / &lt; 60</math> mmHg</li> <li>2. Normal : <math>90 - 79 / 60 - 79</math> mmHg</li> <li>3. Prehypertension : <math>120 - 139 / 80 - 89</math> mmHg</li> <li>4. Stage 1 hypertension : <math>140 - 159 / 90 - 99</math> mmHg</li> <li>5. Stage 2 hypertension : <math>160 - 179 / 100 - 109</math> mmHg</li> <li>6. Hypertension stage 3 or emergency : <math>\geq 180 / \geq 110</math> mmHg</li> </ul>	<ul style="list-style-type: none"> <li>Ordinal</li> <li>Ordinal</li> </ul>	Correlation test <i>rank spearman</i>

## 4.7 Research Ethics

any research, especially those that use humans as subjects, should not conflict with ethics. Therefore, every study must obtain the approval of the researcher. Respondents who have conditions will be protected from their rights to ensure confidentiality. Before the research process was carried out, respondents were given an explanation of the benefits and objectives of the research. After agreeing, you are welcome to sign an agreement letter to become a respondent. Ethics to pay attention to ( Nursalam, 2016)

### 4.7.1 Justice for All Research Subjects (Justice)

Justice is a form of fair therapy towards others who uphold moral, legal, and humanitarian principles. The principle of justice is also stipulated in the Pancasila State of Indonesia in the 5th principle, namely social justice for all Indonesian people (Abrori, 2016)

### 4.7.2 Informed Consent

Subjects must obtain complete information about the purpose of the research to be carried out, have the free right to participate or refuse to be respondents. The informed consent also needs to be stated that the data obtained will only be used for scientific development (Nursalam, Nursing Research Methodology, 2013).

1. Prior to conducting the research, the respondent had permission.
2. If you are willing to be a research respondent, there must be evidence of approval, namely by signature.
3. If the respondent is not willing to be the subject of the study, the researcher may not force it.

#### 4.7.3 Anonymity

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, he must obtain prior approval and take steps to maintain confidentiality and protect the answer (Wasis, 2008).

#### 4.7.4 Confidentiality

The confidentiality of the information obtained from the subject will be guaranteed by the researcher. Testing data from research results will only be displayed in academics.

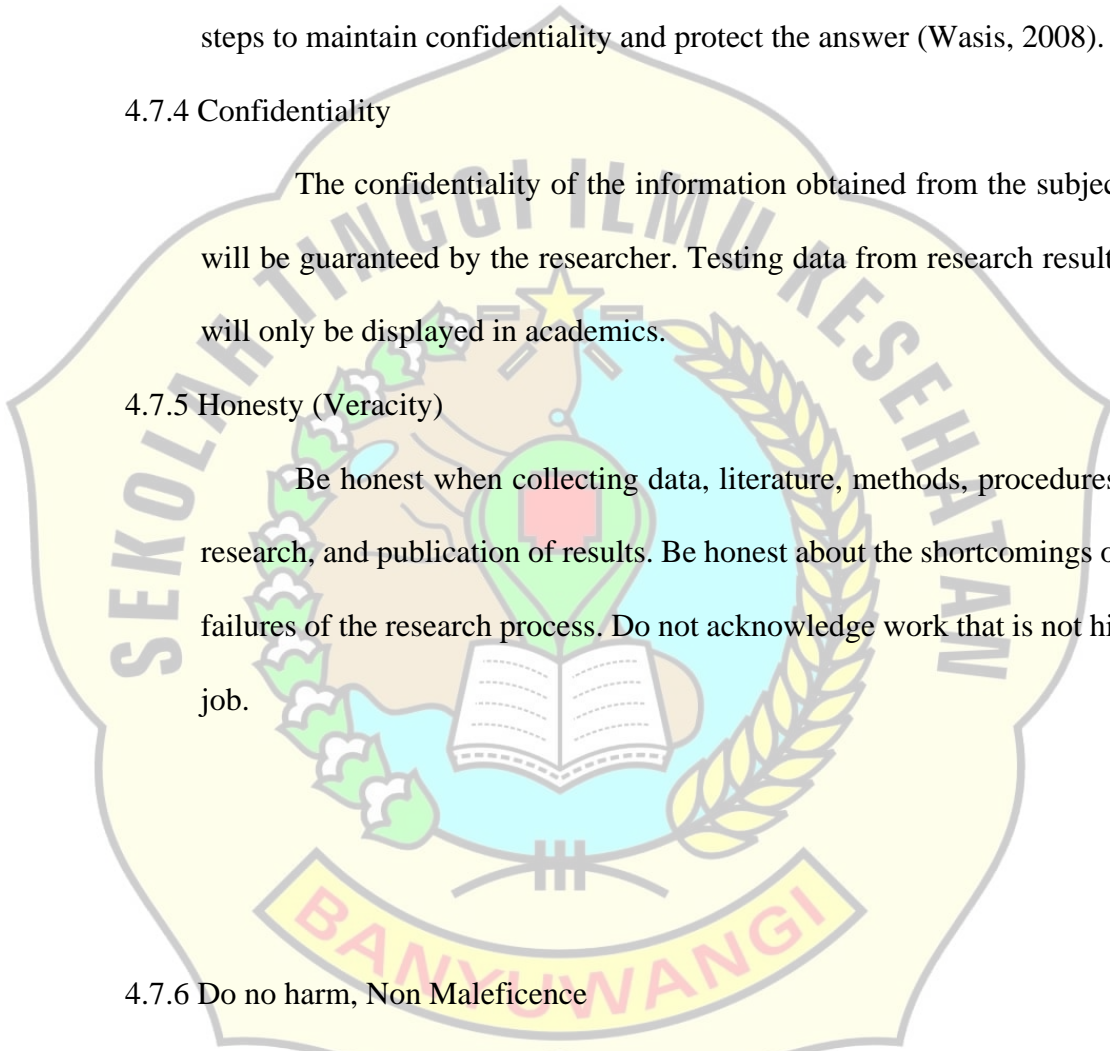
#### 4.7.5 Honesty (Veracity)

Be honest when collecting data, literature, methods, procedures, research, and publication of results. Be honest about the shortcomings or failures of the research process. Do not acknowledge work that is not his job.

#### 4.7.6 Do no harm, Non Maleficence

Non-maleficence is a principle which means that every action taken by a person does not cause harm physical and mental loss (Abrori, 2016).

#### 4.7.7 Respect for human dignity



Respect or respect for people there are two things that need to be considered, namely researchers must consider in depth the possible dangers and misuse of research and protect respondents who are vulnerable to research hazards.

#### 4.7.8 Maximizing Benefit and Minimizing Risk (Beneficence)

The ethical imperative to seek the maximum benefit and minimize the loss or risk for the subject and minimize research errors. In this case the research must be carried out properly and accurately, and the respondent's safety and health must be maintained.

#### 4.7.9 Research Limitations

Limitations of researchers in conducting related research with stress levels and blood pressure on patients with hypertension in the working area of the Klatak Health Center in 2022 are this study does not discuss external factors that affect stress levels in individuals such as family support and anxiety levels.



**CHAPTER 5**

**RESULTS AND DISCUSSION**

This chapter will describe the results and discussion of research that has been carried out entitled "The correlation between stress levels and blood pressure in patients with hypertension in the working area of Puskesmas Klatak in 2022".