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Research Article

The Relationship Between Age, Income, and Anxiety to Hypertension Farmworkers' Blood Pressure in Agroindustry Area Jember Regency

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Abstract

This study aims to determine the relationship between age, income and anxiety to blood pressure in hypertension farmworkers in the agro-industrial area of Jember Regency. The type and design of this research was analytical observational with a cross sectional approach. The population of this study were agricultural workers who experienced hypertension in the work area of the Mumbulsari Community Health Center, Jember Regency. The number of samples used was 66 people using the total sampling method. Data of age and income were analyzed by chi-square, the anxieties data were analyzed by using the Spearman Rank test. The research results also showed that the majority of respondents, namely 47 people (73.4%) experienced mild anxiety. Blood pressure data shows that the majority of respondents have grade 1 hypertension (53%). Statistical test results show that there is a significant relationship between anxiety and blood pressure of hypertension farmworkers in the agro-industrial area of Jember Regency (p-value < 0.038) and there is no significant relationship between age and income (p-value more than 0.05). There is a significant relationship between anxiety and blood pressure in hypertension farm workers and there is no significant relationship between age and income

Keywords : agro industry, farmworker, anxiety, hypertension
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INTRODUCTION

Hypertension is known as a disease with high morbidity and mortality rates. Data from the Indonesian Ministry of Health in 2018 showed 63,309,620 people suffering from hypertension, and cases of hypertension deaths were 427,218. Hypertension is nicknamed "the silent killer" because this disease appears without symptoms, causing delays in treatment. Delays in treating hypertension can cause more dangerous complications (Ariyanti et al., 2020). Globally, an estimated 1.3 billion adults were affected by hypertension in 2019. Southeast Asia occupies third place in hypertension prevalence, with a figure of 32% of the total population (World Health Organization, 2023). The prevalence of hypertension sufferers over the age of 18 years in Indonesia reached 34.11% in 2018. Jember Regency occupies the highest position in the number of hypertension sufferers in East Java, with 741,735 people in 2020 (Kemenkes, 2019).

Riskesdas 2018 presents data that farmers/farm labourers are the occupation with the third highest proportion of hypertension (36.14%) after the non-working group (39.73%) and civil servants/TNI/POLRI/BUMN/BUMD (36.91%) (Kemenkes, 2019). This high figure is related to the level of awareness about hypertension. Hypertension sufferers found during screening were higher than those diagnosed by doctors at 34.11% in 2018. It shows that many people still do not know they have hypertension (Prihartono et al., 2022).

Anxiety is a natural emotion an individual feels because anxiety can be a sign of imminent danger (Pardede & Simangunsong, 2020). Anxiety begins to be considered abnormal if the worry felt becomes uncontrollable and occurs continuously (Alneyadi et al., 2021). Someone who experiences anxiety will usually share an excessive concern about an uncertain future. This worry is accompanied by somatic arousal, for example, increased heart rate, shortness of breath, and sweating (Chen et al., 2020).

Agricultural labourers risk experiencing higher anxiety levels than the general population. On its website, the American Psychological Association (APA) states that prolonged chronic stress can cause anxiety. For example, risk factors for stress experienced by agricultural workers are economic problems, relationships with family, and social isolation (Liang et al., 2021). Data from the Central Statistics Agency (BPS) in April 2022 shows that the average daily income of agricultural workers in Indonesia is IDR 58,109.00. This income is categorized as medium income, between IDR 1,500,000 and IDR 2,500,000 per month (Rakasiwi, 2021). Agricultural workers' physical activity carries a high risk of physical trauma or musculoskeletal complaints. 2018 Riskesdas data showcases the highest rate of musculoskeletal disorders in farmers/farmworkers. Events and concerns about physical trauma trigger anxiety in farm workers (Suryaman & Girsang, 2021).

2020 BPS data reveals the total number of residents working as agricultural labourers in the Jember Regency is 118,891. The subdistrict with the highest number of agricultural

labourers is Mumbulsari Subdistrict, with a total of 8,576 people. Furthermore, Jember Regency is also the district with the highest number of hypertension sufferers in East Java in 2020. Based on previous explanations, farm workers in Mumbulsari District are at risk of experiencing anxiety and hypertension. Research and information regarding agricultural workers' physical and mental health is minimal. Therefore, research is needed regarding the correlation between stress and blood pressure in hypertension farm workers in Mumbulsari District, Jember Regency. The results of this research can be a reference for managing hypertension in agro-industrial communities as well as a reference for health service providers in agricultural worker communities (BPS Kabupaten Jember, 2020).

METHODS

The type and design of this research is analytical observational with a cross-sectional approach design. The location of this research is the work area of the Mumbulsari Community Health Center, Jember Regency. The researchers carried out collecting data in September-December 2022. The population of this study was agricultural workers who experienced hypertension at the Mumbulsari Community Health Center, Jember Regency. The research subjects were farmworkers who had a history of hypertension and were included in the medical records of the Mumbulsari Community Health Center. Respondents in this study were also included in the specified inclusion and exclusion criteria. The inclusion criteria used in this study were that they were willing to be research respondents, respondents could be interviewed directly to measure anxiety and blood pressure, were not taking anti-hypertension medication, did not smoke, and did not consume alcohol. Exclusion criteria were not being able to understand the questionnaire questions even though an explanation had been given, and canceling consent to take part in the research.

The number of samples used in this research was 66 people with a total sampling method. The data used is primary data in the form of anxiety levels and blood pressure and secondary data in the form of data on the number of farm workers who experience hypertension. Secondary data was obtained from medical records at the Mumbulsari District Health Center after obtaining permission from the Health Service for researchers to take medical record data. Secondary data was a list of farmworkes with hypertension. Primary data was obtained directly from research respondents after providing informed consent from the researcher to the respondent. Anxiety levels were measured using the Hamilton Rating Scale for Anxiety questionnaire, and blood pressure data was measured using a sphygmomanometer. Data of age and income were analyzed by chi-square to know the correlation with hypertension prevalence. The anxieties to hypertension prevalence were analyzed by using the Spearman Rank test**.**

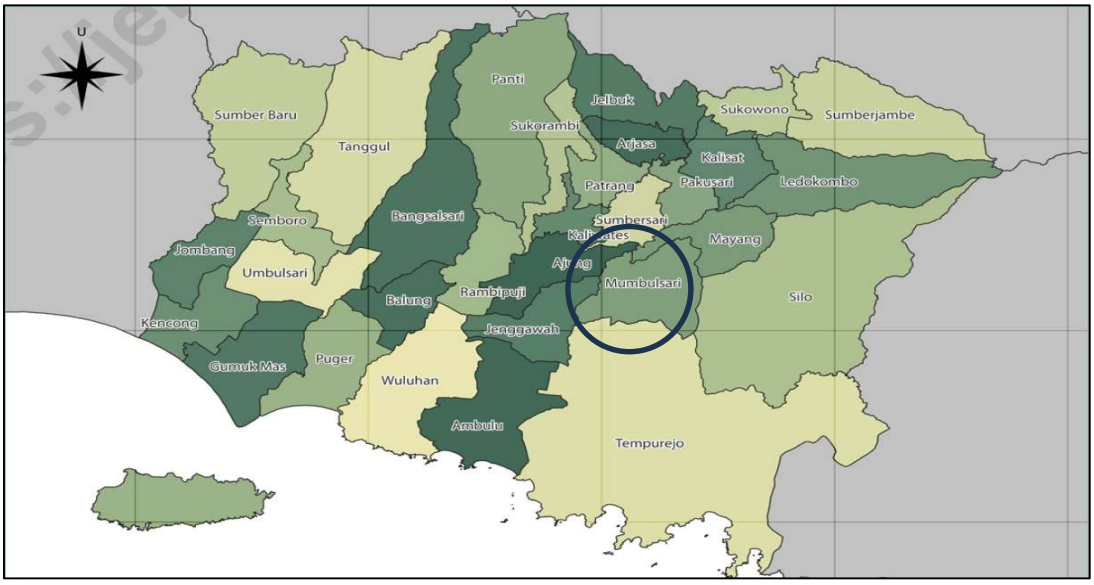
Ethical clearance

The ethics committee of the Faculty of Medicine, University of Jember, Indonesia, with regards of the protection of human rights and welfare in medical research, has carefully reviewed this study. The number of ethical approval is 1678/H25.1.11/KE2023 on January 6th 2023.

RESULTS

GEOGRAPHY POSITION AND CLIMATE CONDITION

Data from Central Bureau of Statistics of jember (2023) said that Mumbulsari District is one of the sub-districts in Jember Regency, East Java Province, Indonesia. Mumbulsari District is located approximately 10,83 kilometers from the center of Jember city. Having an area of 86,091 square kilometers, Mumbulsari borders directly with Mayang District to the north, Ajung District to the west, and Tempurejo District to the south. The height of the area ranges from 25 to 500 meters above sea level, with details of the sub-district area according to altitude, namely 35.94 km2 at an altitude of 25-100 meters above sea level; 52.94 km2 at an altitude of 100-500 meters above sea level; and 6.25 km2 at an altitude of 500-1000. The amount of rainfall throughout the year is 122.50 mm, making the Mumbulsari District area fertile and suitable for farming. This is what makes Mumbusari District the largest contributor of agricultural commodities in Jember Regency, so it cannot be denied that the largest ratio of farmers to area comes from this region (18,594 people) (11).



Source: Central Bureau of Statistics of Jember, 2023

Figure 1. Map of Subdistrict of Mumbulsari in Jember Regency

THE CHARACTERISTIC OF RESPONDENT

Gender

Respondent gender data is composed by men and women. This research involved a total of 66 respondents, namely 5 men (7.9%) and 59 women (92.1%). Based on these data, it appears that the distribution of respondents is not evenly distributed by gender. Most of the respondents were women, so bivariate analysis could not be carried out to find a correlation between gender variables and hypertension.

Age

Most of the respondents were in the 45-64 year age group with a total of 39 people (60.9%). The age group with the lowest number is the age group ≥75 years, which only numbered 4 people (6.3%). 9 people (14.1%) were in the 18-44 year age group, and 12 (18.7%) people were in the 65-74 year age group. Based on this data, the age distribution of respondents suffering from stage 1 hypertension was 34 people aged more than or equal to 40 years, and 1 person aged 15-39 years. Meanwhile, 30 respondents suffered from stage 2 hypertension, and 1 person was aged 15-39 years. The results of data analysis tests to determine the correlation between age and hypertension in respondents showed that there was no significance (p-value more than 0.05), namely 0.365.

Marital Status

All 66 respondents (100%) were married. There were no respondents who were widows or widowers or who were single.

Level of income

To measure income, the Jember Regency Regional Minimum Wage/UMR indicator in 2022 is used, which is around 2,000,000 rupiah. The results of data processing showed that the income of the majority of respondents was below the minimum wage, namely 31 people with stage 1 hypertension and 27 respondents with stage 2 hypertension. Respondents who had salaries above the minimum wage were 4 each for stage 1 and 2 hypertension. After the data was collected, the data was processed using chi-square to determine the correlation between income variables and hypertension in respondents. The results of data analysis show a p-value of 0.855, which means the significance value is more than alpha. This shows that there is no correlation between the income variable and hypertension in respondents.

Level of anxiety

The results showed that 12 people (18.8%) experienced normal levels of anxiety, 47 people (73.4%) experienced mild anxiety, four people (6.2%) experienced moderate anxiety, and one person (1.6%) experienced severe stress. Blood pressure data shows that the majority of respondents have grade 2 hypertension. The statistical test results show a

significant relationship between anxiety and the blood pressure of hypertension farmworkers in the Mumbulsari Community Health Center work area, Jember Regency (p-value < 0.05). The correlation coefficient value is 0.26, which can be concluded that the strength of the relationship between the two variables is quite strong. This research concludes a significant relationship between anxiety and the blood pressure of hypertension farmworkers. Suggestions for further research are that it is necessary to add control to other factors that influence blood pressure, for instance, a history of diabetes, sodium intake and body mass index.

Table 1 Level of Anxiety Regarding Respondents' Blood Pressure

Level of Anxiety		**Blood Pressure Classification**		
		1st Degree Hypertension	2nd Degree Hypertension	Total
Normal	Amount (n)	10	2	12
	Percentage (%)	15,6%	3,1%	18,8%
Mild Level of Anxiety	Amount (n)	15	32	47
	Percentage (%)	23,4%	50%	73,4%
moderate level of anxiety	Amount (n)	2	2	4
	Percentage (%)	3,1%	3,1%	6,2%
severe level of anxiety	Amount (n)	1	0	1
	Percentage (%)	1,6%	0%	1,6%
Very severe level of anxiety	Amount (n)	0	0	0
	Percentage (%)	0%	0%	0%
Total Sample (n)				64
Percentage of Sample (%)				100%

DISCUSSION

According to the research results, the discussion includes gender, age, marital status, income, and degree of anxiety in respondents with hypertension. Most of the respondents in this study were women. A total of 59 (92.1%) respondents were female and 5 (7.9%) respondents were male. This is because there are inclusion criteria for respondents not smoking and not drinking alcohol. The use of these inclusion criteria is to minimize bias because cigarettes and alcohol can cause anxietyWomen of productive age have a lower potential for cardiovascular disorders than men. The hormone estrogen in women plays a role in protecting the cardiovascular system as an antioxidant and protector of blood vessels. Women who have gone through menopause, on the other hand, are more susceptible to increased blood pressure due to the decreased protective effect of the hormone estrogen. Decreased estrogen levels after menopause lead to changes in vascular function, increased inflammation, increased renin-angiotensin-aldosterone system, sympathetic nervous system, and decreased nitric oxide-dependent vasodilation. This

degeneration mechanism explains that the risk of cardiovascular disorders increases in women with increasing age (Kirnawati et al., 2021; Maas et al., 2021).

Most of the respondents in this study belonged to the age group 45-64 years. This shows that in this age range many individuals experience hypertension, regardless of their level of anxiety. This phenomenon is supported by research by Nuraeni (2019) which states that age ≥45 years increases the risk of hypertension by 8.4 times higher than age ≤ 45 years. Ages over 45 years have a 90-fold risk of death from heart disease (Nuraeni, 2019). However, the results of this study indicate that age is not related to hypertension among farmworkers. This condition is suspected to occur due to other factors that are more dominant in triggering hypertension in farmworkers. The high level of physical activity performed by farmworkers affects blood pressure stability; the higher the level of physical activity, the lower the blood pressure may become. Physical activity can also improve insulin sensitivity, which plays an important role in metabolism and can help control blood pressure (Sudano et al., 2020).

The marital status of all respondents is married. According to Kirnawati et al. (2021) marital status is not related to the risk of developing high blood pressure (Kirnawati et al., 2021). This is different from the results of research by Son et al. (2022) conducted in Korea shows that marriage and gender influence blood pressure (Son et al., 2022). Single men have a higher risk of hypertension than married men. This may be due to the protective effect of marriage or selection theory that healthy individuals tend to marry. Men who have partners show higher medical control compliance, medication adherence, and screening program participation than single men. On the other hand, single women have a lower risk of hypertension than married women. Divorce has a strong impact on cardiovascular health conditions in women. Economic hardship and divorce or widowhood are important risk factors for hypertension in women. The marital status that has the most influence on hypertension is divorce. Women's economic dependence on men pushes women into worse economic conditions after divorce. This condition is exacerbated by decreased social support, worsening eating patterns, stress and depression due to the divorce process. In Indonesia, divorced women have a negative stigma and are at greater risk of falling into poverty. Many divorced women do not have legal and economic certainty, while they are still obliged to fulfill their family's economic needs (Defianna et al., 2021).

The results of the study on the correlation between income and hypertension indicate that there is no significant relationship between the two. This condition is suspected to occur because there are other factors that influence hypertension among farmworkers. Farmworkers with a supportive social environment can obtain social support from their families, which can enhance their ability to live healthily and manage their blood pressure, even with low income. A high level of health awareness can also help prevent hypertension regardless of an individual's economic status (Rakasiwi, 2021).

Research by Sudano et al. (2020) states that lifestyle factors such as lack of physical activity, obesity, smoking, alcohol consumption, and a diet high in fat and sodium are most often associated with high blood pressure. Apart from lifestyle, psychological factors such as anxiety can also cause increased blood pressure. Knowledge can also influence high blood pressure. Low levels of education and knowledge result in low awareness of the dangers of high blood pressure. This lack of awareness ultimately results in low health care seeking behavior. Uncontrolled health conditions cause a person to be susceptible to lifestyle diseases such as hypertension (Machaalani et al., 2022; Salaroli et al., 2020). Reducing blood pressure can be done by modifying lifestyle and administering pharmacological therapy (Sudano et al., 2020).

Anxiety levels in this study were measured using the Hamilton Rating Scale for Anxiety (HAM-A), which consists of 14 elements or indicators of anxiety. These elements are feelings of anxiety, tension, fear, sleep disorders, intelligence disorders, feelings of depression, somatic symptoms, cardiovascular symptoms, respiratory symptoms, gastrointestinal symptoms, urogenital symptoms, autonomic symptoms, and behavior during the interview. Each element has a score of 0-4 with 0: no symptoms, 1: mild symptoms, 2: moderate symptoms, 3: severe symptoms, 4: very severe symptoms. The scores from each element are then added up and interpreted into a level of anxiety. A total score of 0 means normal, a score <17 indicates mild anxiety, 18-24 indicates moderate anxiety, while a score of 25-30 indicates severe anxiety, and a score >30 indicates very severe anxiety (Ramdan, 2019).

Anxiety in agricultural workers is influenced by socioeconomics, family support, and occupational risks (Liang et al., 2021; Suryaman & Girsang, 2021). Respondents in this study work as agricultural laborers who earn between 30 and 50 thousand rupiah per day. This income is uncertain every day depending on whether or not there is a call for work from the land owner. This has an impact on the economic condition of respondents who are less prosperous and can trigger anxiety. This condition is in line with research in Thailand and England which shows a significant relationship between low economic status with psychological problems (Lazzarino et al., 2014).

Apart from socioeconomic factors, demographic factors such as gender also influence the occurrence of anxiety. The gender of respondents who experienced the most anxiety was women. This is in accordance with research in USA with the results that women experienced higher anxiety scores than men (Maslakçı & Sürücü, 2022).

Anxiety is more common in women, influenced by several things, for example responses to stress and pain, social concepts, and responses to internal and external problems. Women feel pain and stress more easily than men, this leads to a higher likelihood of women experiencing anxiety than men. The concept of masculinity and femininity in society shows that men are individualistic and assertive while women are more sensitive to the affection and needs of other people. The roles of each gender that have been formed

in society ultimately lead men to focus more on external problems while women focus on internal problems, for example depression and anxiety (Gao et al., 2020). Anxiety is characterized by several indicators. The first indicator of anxiety is negative feelings, for example feelings of worry, bad feelings, and irritability. The one of study showed that negative affect dysfunction has a significant effect on depression and anxiety. This affective disorder can be a predictor of anxiety that a person is experiencing. High negative affect and psychological impulses physiologically cause psychological changes that lead to feelings of anxiety (Trikusuma & Hendriani, 2021). Psychological pressure causes disturbances in the emotional center, one sign of which is the emergence of a feeling of difficulty in calming down. When someone experiences anxiety, the body responds by showing signs of tension, for example feeling tired, having difficulty resting, feeling restless, etc. This physiological response can be intervened with relaxation therapy to relieve tension and make anxious patients calmer (Vibriyanti, 2020).

The third indicator of anxiety is fear/fear. The classic theory of anxiety etiology explains that anxiety is a form of fear conditioning. Examination of central nervous system activity by Alneyadi et al. (2021) shows that fear-regulating areas such as the thalamus, hippocampus, amygdala and frontal lobe are also involved in the development of anxiety (Alneyadi et al., 2021). The neurological mechanism that explains this phenomenon is that there may be an overlap in the areas that regulate anxiety and feelings of fear, so that anxious individuals can also feel fear. Psychological disorders due to anxiety cause decreased levels of concentration and memory. Research on anxiety and concentration in Indonesia shows the results that there is a correlation between the two variables. Individuals who experience anxiety tend to experience decreased concentration. Anxiety can divert a person's focus or concentration, resulting in interference with the identification and resolution of a problem. Someone who is anxious will focus more on the cause of their anxiety so that their concentration and memory performance will decrease (Kholik Sanaba et al., 2022).

Anxiety conditions are often accompanied by symptoms of other psychological disorders such as stress and depression. Symptoms of depression, for example loss of interest and decreased interest in hobbies, can be found in individuals who experience anxiety (Ramdan, 2019). This statement is supported by research findings on depression by Sunjaya et al. (2021) that in individuals who experience depression, anxiety is also found (Sunjaya et al., 2021). This is because anxiety and depression are both manifestations of disorders in the same system, so they can appear simultaneously or overlappingly. The psychological pressure of anxiety can be projected into somatic symptoms in the form of uncomfortable sensations in the muscles. The emergence of this disorder cannot be explained in detail, but it is closely related to the occurrence of anxiety. Somatic muscle disorders are one of the criteria that need to be considered when treating patients with anxiety. Reducing muscle symptoms is an indicator of the success of anxiety therapy

(Crusio et al., 2020). Anxiety symptoms are found in many individuals who experience somatic sensory symptoms. Sensory somatic disorders such as tinnitus are associated with anxiety events. Research in Thailand shows data that patients who experience tinnitus also experience anxiety during the same period. Experts suspect that tinnitus activates the limbic system and sympathetic system excessively and hyperactively (Hou et al., 2020). This inappropriate activation then contributes to psychological disorders such as anxiety, depression, panic symptoms and sleep disorders.

The potential relationship between psychological disorders and tinnitus is at least three possibilities: psychological disorders predisposing to tinnitus, tinnitus predisposing to psychological disorders, and tinnitus appearing as a comorbidity in patients with psychological disorders. The sympathetic nervous system activated by anxiety can affect the condition of the cardiovascular organs. Activation of the sympathetic system in anxiety will increase heart rate, and increase blood pressure over a long period of time. This physiological process is projected as a sensation of palpitations, tachycardia, pain in the chest, and a feeling like you are going to faint. The effect of the sympathetic nerves on the coronary arteries is blood vessel spasm. Coronary spasm in anxious patients with comorbid cardiovascular disease can trigger an infarction that causes a heart attack (Lumban Tobing & Wulandari, 2021).

Complaints in the respiratory system can also be found in individuals who experience anxiety. On of the research showed that blood CO2 levels increased in people who experienced anxiety. This condition causes shortness of breath and shortness of breath. The body's mechanism for dealing with excess CO2 is by increasing respiratory muscle activity to increase the intake of oxygen into the blood. This physiological mechanism is an indicator of anxiety, returning to normal breathing conditions can be a marker of reducing anxiety. Psychological disorders such as anxiety and depression can have a direct effect on the digestive system. There are several theories that explain this. The first theory is that disturbances in the emotional center, for example anxiety, can affect the gut-brain axis GBA so that symptoms of digestive disorders appear. The second theory, anxiety which activates the sympathetic nervous system indirectly reduces the performance of the parasympathetic nervous system. The digestive tract is regulated by parasympathetic nerves, so it will be directly affected by a decrease in parasympathetic activity. These two theories are in accordance with the research results of Söderquist et al. (2020) which revealed that patients with a history of psychological disorders or who are on psychotropic medication tend to experience anxiety or depression (Söderquist et al., 2020).

The gastrointestinal symptoms experienced by respondents were positively correlated with the level of anxiety or depressive symptoms. Urogenital symptoms, for example incontinence, can be a sign of anxiety. Anxiety can influence the incidence of incontinence through the serotonergic pathway. Decreased serotonin levels in the central

nervous system are associated with increased urinary frequency and bladder contractions, while activation of the central serotonergic system suppresses reflex bladder contractions and increases the voiding threshold volume in animal studies. Research by Mehr et al. (2022) showed that there was a positive relationship between the incidence of overactive bladder (OAB) and anxiety levels. The higher the level of anxiety experienced by the respondent, the higher the degree of severity of OAB symptoms experienced (Mehr et al., 2022). Anxiety is also linked to reproductive system disorders in women such as menstrual disorders and decreased sexual desire. Phelan et al. (2021) explained in their research that menstrual disorders reported by research respondents were found to be associated with the psychological pressure they faced (Phelan et al., 2021). Psychological disorders also increase pre-menstrual symptoms, thereby interfering with activities, and decrease libido resulting in low sexual desire (hypoactive sexual desire).

The body's autonomic activity can be a predictor of anxiety conditions. The body's autonomic responses such as dry mouth, pale skin, frequent sweating are associated with increased sympathetic nerve activity in anxiety. Anxiety activates the "fight or flight" response, thereby reducing parasympathetic nerve activity such as saliva production, and vasoconstricting peripheral arteries so that the skin appears pale (Lenga et al., 2022). Anxiety conditions give rise to distinctive attitudes or behavior and often appear without the sufferer realizing it. Movements such as pacing back and forth, a tense face, furrowed eyebrows, and frequent swallowing can be indicators to suspect that someone is experiencing anxiety. The results of research by Cita and Susantiningsih (2020) showed that respondents who showed anxious attitudes or behavior were found to experience severe levels of anxiety (Cita & Susantiningsih, 2020). This shows that anxiety status checks need to be carried out on individuals who show anxiety so that they immediately receive appropriate treatment.

CONCLUSION

The characteristics of farm workers who experience hypertension in the Mumbulsari Health Center work area are: The gender of farm workers who experience hypertension is primarily women, most of the respondents were in the productive age range, the marital status of all respondents in this study was married, the income of the majority of respondents was below the minimum wage of Jember district, the incidence of anxiety among respondents in this study was mild anxiety which most often experienced by respondents. The statistical test results show a significant relationship between anxiety and the blood pressure of hypertension farmworkers and there is no significant relationship between age and income.

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