

ANALYSIS OF PUBLIC WILLINGNESS TO PAY (WTP) FOR OLD-AGE SECURITY IN BANDA ACEH

Abstract

Old-Age Security (JHT) is one of the social security programs for workers as a protection in the retirement age. However, the current affordability of old-age security is still limited. This study aims to estimate the value of Willingness to Pay (WTP) for old-age security and analyze factors that affect the WTP of old-age security in Banda Aceh. The research method used to determine the community's WTP value is the Contingent Valuation Method (CVM) and the use of the chi-square test ($\alpha=0.05$) to analyze the data. This research examined primary data with a total sample of 100 respondents. The results showed that respondents' average Willingness to Pay (EWTP) for old-age security was Rp634,074 per person per month. The variables that influenced the WTP of respondents' old-age security were age, occupation, and the number of family members. The variables that affect the WTP of old-age security are age, occupation, and the number of family members. It recommends that the government and the Social Security Agency for Employment (BPJS Ketenagakerjaan) work together to provide counseling and socialization related to the current social protection program so that the public will be more aware and able to understand the benefits of this program.

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1. Introduction

Along with the population growth of Aceh, the population of Banda Aceh (figure 1) shows a decrease in the proportion of the young population (under 15 years old) by 4.5 percent from 2015 to 2025. The middle part of the pyramid is dominated by the population aged 20-34. The working-age population (15-64 years old) grew significantly, from 72.52 percent in 2015 to 75.29 percent in 2025. Similarly, the elderly population (65 years and older), from 2.37 percent in 2015, rose to 4.1 percent in 2025.

The demographic transition of Banda Aceh as a whole is shown by the pyramid population of the middle to the top part (15 years and older), which is increasingly convex from 2015 to 2025. It suggests a decrease in the mortality rate, an increase in life expectancy, an increase in the proportion of the elderly population and the working-age population, including a decrease in the proportion of the young population. This phenomenon is known as population aging, increasing the median age in a population because of declining fertility rates and rising life expectancy (United Nations). Population aging due to an increase in life expectancy is an important indicator to analyze because it is used to see the development of a country's health, especially for the economic development of a region (Mahumud et al., 2013).



Figure 1. Population Pyramids of Banda Aceh from 2015 to 2025
Source : Central Bureau of Statistics (BPS) Aceh, 2015

Banda Aceh, the capital of Aceh, is the centre of various government activities, education, health, trade and services, religious centres, and transportation routes for land, sea, and air. Hence, the economic development in Banda Aceh needs to be adequately considered. In 2020, the population's life expectancy in Banda Aceh increased from the prior year to 71.45 years (BPS Aceh). It shows an improvement in the level of community welfare so that the population's life

expectancy will be longer. According to Heryanah (2015), the better the population's life expectancy, the greater the number of people classified as elderly.

Increasing life expectancy, which directly impacts the increase in the elderly population, will be a potential challenge to development success. According to Choi and Shin (2015), an increasing elderly population can hamper the potential for economic growth due to population aging, which causes the growth of the labour supply to decrease and the growth of the capital stock to increase. The percentage of elderly population projection in Banda Aceh is detailed in table 1 below.

Table 1. Percentage of Elderly Population Projection in Banda Aceh from 2015-2025

City	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Banda Aceh	4,98	5,14	5,32	5,50	5,69	5,88	11,64	6,30	12,47	6,74	6,98
Aceh	6,77	6,99	7,22	7,46	7,71	7,96	16,27	8,51	17,40	9,09	9,40

Source: Central Bureau of Statistics (BPS) Aceh, 2015

The percentage of Aceh's elderly population in 2023 will reach a relatively high number of 17.40 percent. Similar to the percentage of Aceh's elderly population in 2023, the elderly population of Banda Aceh also projects to get the highest number at 12.47 percent. Problems related to the elderly need to anticipate immediately to avoid various obstacles in the development process. This problem is not only addressed to the elderly population but also to the working-age population. The elderly population is expected to be healthy, active, and productive and not a burden to their families when they are old. These can be achieved by regulating the pattern of life, maintaining health, and optimally preparing for old age (Kemenkes RI, 2016).

Social security programs for workers, such as Old-Age Security (JHT) and pension security, are a form of social protection in old age. The percentage of households with JHT and pension security in Banda Aceh is shown in the following graph.

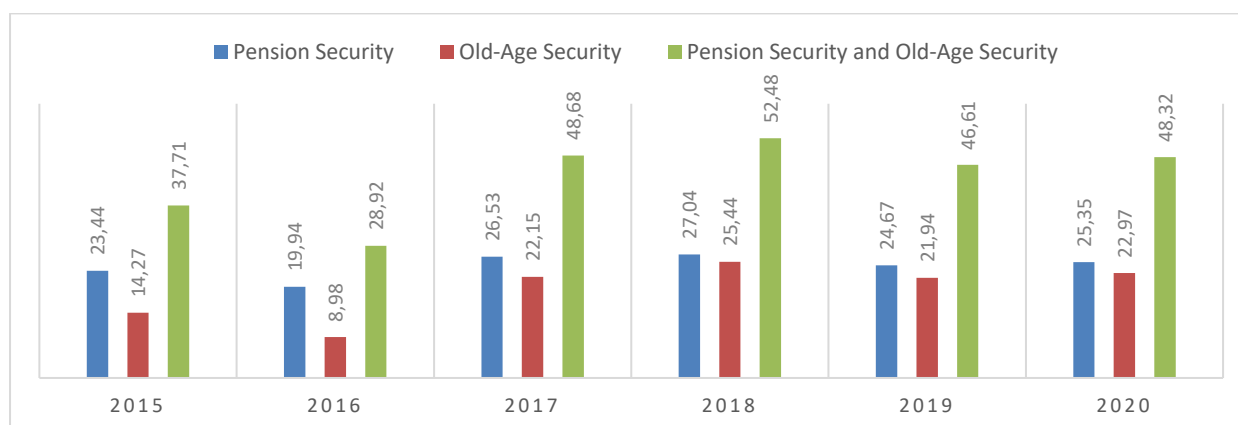


Figure 2. Percentage of Households with Pension Security and Old-Age Security in Banda Aceh 2015-2020
Source : Central Bureau of Statistics (BPS) Banda Aceh, 2020

The percentage of households in Banda Aceh City with JHT and pension security (figure 2) fluctuates from year to year. The highest figure reached was 52.48 percent in 2018, of which 25.44 percent were part of households that had JHT. This figure is still relatively small because it only comes to a quarter of one hundred percent. As the population of the elderly population increases, the need for the JHT program should be higher. On the other hand, changes in the percentage of households with JHT are not simultaneously by changes in the percentage of the elderly population, which increases every year.

The problem that will occur subsequently is for the families of the elderly population who do not have social security, especially the sandwich generation. The sandwich generation is the middle-aged generation with dependent children and elderly parents, which will be an additional financial burden. Existing resources must be divided; hence investment in children's needs is not optimal. According to Salmon (2017), the emergence of these dual roles and responsibilities will negatively impact physical, emotional, psychological, and finances.

Residents who do not have JHT generally rely on financial assistance and care from their families due to the limited social protection provided by the government. Suryadi (2018), in his research, suggests that the elderly who are not retired civil servants usually get social protection from their families. Meanwhile, civil servants have a pension guarantee as protection in old age as stated in Law No. 43 of 1999 Article 10 that a pension is an old age guarantee as remuneration for serving the country. Therefore, it is necessary to know how old-age security preferences of residents who are not civil servants are. In this study, the occupation of the population is seen from two sides, white-collar and blue-collar workers.

The participation coverage of Indonesian people who have JHT is only around 5.4 percent. There is still a lot of elderly population who still have to work, especially those who live alone and come from the middle to lower economic circles (TNP2K, 2020). Related to this problem, the elderly are a vulnerable group who need social security to meet their daily needs. Currently, the level of affordability of the JHT program is still minimal and needs to be expanded. According to Magdalena (2019), special attention is needed from the government regarding long-term programs that support the health and education of the elderly so that they do not become dependents but become productive.

Thus, the issue of old-age security needs to be analyzed from the side of microanalysis, which is people who need old-age security. In this research, the Banda Aceh community's will for old-age security is measured by the Willingness to Pay (WTP) approach.

2. Literature Review

Old-Age Security (JHT) is one of the employment social security programs in the form of cash benefits that are paid at once when participants enter retirement age (PP No. 46 of 2015 Article 1 paragraph 1). The JHT program is organized by the Workers' Social Security Management Agency (Ketenagakerjaan, 2021).

Willingness to Pay (WTP) is a method used to determine the maximum amount an individual is willing to allocate for programs, services, and health technologies (Wong et al., 2020). According to Nicholson and Snyder (2012), the demand curve exhibits a negative slope, indicating that as the quantity increases, people are inclined to pay less for the last unit purchased. The value assigned to this final unit establishes the price for all units acquired. Although a higher-priced commodity, driven by its elevated marginal value (as people are willing to pay more for an additional unit), can be justified if it also delivers substantial extra utility. Thus, at the margin, the price of a commodity mirrors an individual's willingness to pay for one more unit. This holds significant importance in applied welfare economics, as the willingness to pay can be deduced from market responses to prices.

Primatry et al., (2014) in their research stated that the Contingent Valuation Method (CVM) allows for every commodity that does not have a market to estimate its economic value through the WTP concept. The Contingent Valuation Method (CVM) is an approach that relies on surveys, hypothetical scenarios, and direct questioning to ascertain the monetary worth assigned to enhancements in goods or services. Questions based on the CV method are employed to gauge the demand function or to establish a distribution of consumers' willingness to pay (Pavel et al., 2015). While evaluating the willingness of individuals to pay (WTP) for social protection in the form of old-age security, various factors come into play such as age, information, income, occupation, and the number of family members, all of which influence the WTP.

Age is one of the determinants that have an impact on productivity (Tanto, 2012). The working-age population generally has a higher level of productivity than the elderly due to limited physical abilities. According to Sunarjito and Wibowo (2014), age has a negative effect on WTP because younger respondents are more willing to participate in insurance programs than elder do.

Information becomes a motive for someone to act in accordance with the knowledge he has. According to Sati (2015), information is data that is processed so that it can be considered in making the right decisions. An individual's level of knowledge affects the level of willingness to pay.

Income depends on the business field, position, general income level, business prospects, and others (Irawati et al., 2013). The level of income is related to the ability to pay and someone's willingness to pay.

Occupation, in this study, is classified into white-collar and blue-collar employees. White-collar and blue-collar employees are differentiated by job characteristics and behavior. Generally, blue-collar employees whose career paths are relatively restricted do physical work, whereas white-collar perform as professional and semi-professional employees (Hu et al., 2010). Moreover, white-collar employees do higher-level jobs and blue-collar employees do lower-level jobs (De Spiegelaere et al., 2012).

The number of family members is the number of family burdens. The larger the number of family members, the greater the need that must be met (Lestari & Aliasuddin, 2016).

Therefore, in this research hypothesis, it is assumed that the variables of age, information, income, occupation, and the number of family members affect the WTP of old-age security.

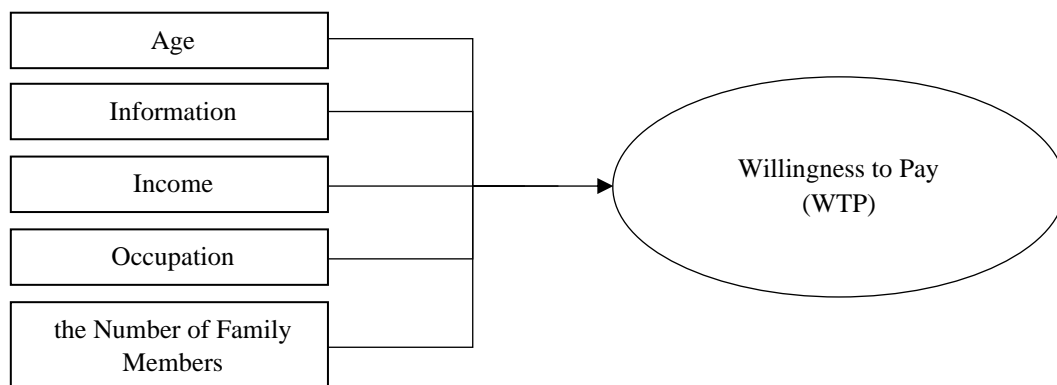


Figure 3. Conceptual Framework

3. Research Method

This research is conducted in Banda Aceh and the object of research is residents working in Banda Aceh, excluded civil servants. This study used primary data collected by conducting research in the field, the results of which are filling out questionnaires and interviews. Meanwhile, secondary data obtained from the Central Statistics Agency (BPS), BPJS Ketenagakerjaan and related agencies are used to support primary data to strengthen research and complete information. The sampling technique is Purposive Sampling; respondents are selected with certain condition (Sugiyono, 2018:85). The criteria for the population as respondents are (1) working (excluded civil servants) and (2) productive age (excluded child labour, less than 55 years). To determine the sample size or the number of respondents in this study, the author used the Slovin formula (Sati, 2015:24):

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

Information:

n = Number of samples needed

N = Total population

d = error (1 – confidence level)

Confidence level = 1 – α

Based on the Slovin formula with a population of 91,362 people and a 90% confidence level, the sample size:

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

$$n = \frac{91.362}{91.362*(1-0.90)^2+1} = 99,89 \text{ (100) respondents}$$

The estimated WTP value is obtained through the Contingent Valuation Method (CVM). The steps that need to be done are as follows:

1) Build a Hypothetical Market

“BPJS Ketenagakerjaan is the organizer of employment social security programs, one of which is Old-Age Security. Social protection in old age needs to be prepared to become healthy, productive and independent elderly. In addition, this program is an alternative to living old age without burdening financial problems. However, the current affordability of social protection programs is still limited and needs to be expanded so people can get protection in old age.” By knowing the description of the market, are the respondents willing to pay a nominal amount of money for the Old-Age Security?

2) Bring up the Bid Value (Bid)

The survey was conducted by filling out a questionnaire via google forms and direct interviews (face to face). In the questionnaire, each respondent is asked about the value of money that the respondent is willing to be paid (WTP) using the Direct Question (Open-Ended Question) method, which is to ask directly what the minimum and maximum WTP amounts for the Old-Age Security are willing to pay, without any offered value specified given.

3) Estimating the Average Value of WTP by using the following equation:

$$EWTP = \sum_{i=1}^n W_i (P_{fi}) \quad (2)$$

Information:

EWTP = Estimated mean WTP

W_i = *i*-th WTP value

P_{fi} = Relative frequency

n = Number of respondents

I = Respondent *i*-th who is willing to pay WTP

4) Estimating the Bid Value Curve (Bid Curve)

A WTP curve is estimated using the value of WTP that respondents are willing to pay and the number of respondents.

This study used the Chi-Square test to analyze data. The Chi-Square test is a non-parametric statistical test tool, in this case, to see whether there is an influence between the independent variables on the dependent variable. Hence, this research examines the impact between age, information, income, occupation and the number of family members on Willingness to Pay (WTP). The data is processed using SPSS with decision-making based on probability. If probability > 0.05, Ho is accepted, meaning that the independent variable does not affect the dependent variable. If the probability is < 0.05, Ho is rejected, meaning that the independent variable does not affect the dependent variable.

The data used in conducting the chi-square test is nominal in a definite form. Aspects of measuring research variables in detail can be seen in Table 2 below.

Table 2. Aspects of Measuring Research Variables

Code	Variable	Category		Note
Y	Willingness to Pay	0 = Unwilling	1 = Willing	Dependent Variable
X1	Age	1 = 15-24	3 = 35-44	Independent Variable
		2 = 25-34	4 = 45-54	
X2	Information	0 = Unknowledgeable	1 = Knowledgeable	Independent Variable
X3	Income	0 < Regional Minimum Wage	1 ≥ Regional Minimum Wage	Independent Variable
X4	Occupation	0 = Blue Collar	1 = White Collar	Independent Variable
X5	the Number of Family Members	0 = Null	3 = Three Members	Independent Variable
		1 = One Member	4 = Four Members	
		2 = Two Members	5 ≥ Five Members	

4. Results and Discussion

Willingness to Pay of Respondents to Old-Age Security

In this study, Willingness to Pay (WTP) is the respondent's willingness to pay for Old-Age Security (JHT). Based on the results of research from 100 respondents, 46 respondents stated that they were willing to pay for Old-Age Security and 54 respondents indicated that they were not willing to pay for Old-Age Security (see Figure 4).

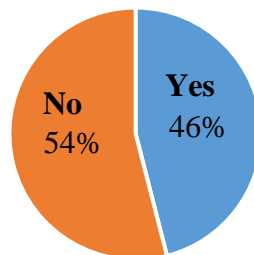


Figure 4. Respondents' WTP for Old-Age Security
Source: Primary Data, 2021 (Data processed)

The CVM method, in this study, was used to analyse respondents' WTP value on Old-Age Security. The research results on WTP include the average value of WTP and the WTP demand curve (Bid Curve). The survey was conducted using the Direct Question (Open-Ended Question) method by asking respondents what the maximum and minimum amounts of money they want to pay are. The research results regarding the respondents' WTP values can be seen in the table below.

Table 3. Distribution of Respondents' WTP

No.	WTP (Rp)	Frequency	Percentage	Cummulative Frequency	Relative Frequency	EWTP
1	50.000	1	2	46	0,02	1.087
2	77.400	1	2	45	0,02	1.683
3	100.000	6	13	44	0,13	13.043
4	140.000	1	2	38	0,02	3.043
5	150.000	1	2	37	0,02	3.261
6	200.000	4	9	36	0,09	17.391
7	250.000	1	2	32	0,02	5.435
8	300.000	4	9	31	0,09	26.087
9	400.000	3	7	27	0,07	26.087
10	500.000	12	26	24	0,26	130.435
11	700.000	1	2	12	0,02	15.217
12	1.000.000	6	13	11	0,13	130.435

No.	WTP (Rp)	Frequency	Percentage	Cumulative Frequency	Relative Frequency	EWTP
13	1.500.000	2	4	5	0,04	65.217
14	2.000.000	1	2	3	0,02	43.478
15	3.000.000	1	2	2	0,02	65.217
16	4.000.000	1	2	1	0,02	86.957
Total		46	100	46	1,00	634.074

Source: Primary Data, 2021 (Data processed)

Based on the data in table 3, the minimum value of the respondent's WTP is Rp. 50,000 and the maximum value of the respondent's WTP is Rp. 4,000,000. The estimated average WTP (EWTP) based on the distribution of WTP obtained from the result of multiplying the WTP value of the respondent with the relative frequency of the respondent is Rp. 634,074.

The demand curve of WTP for Old-Age Security that illustrates the relationship between WTP of respondents and the cumulative frequency of the number of respondents who are willing to pay the value of WTP is shown in Figure 5.

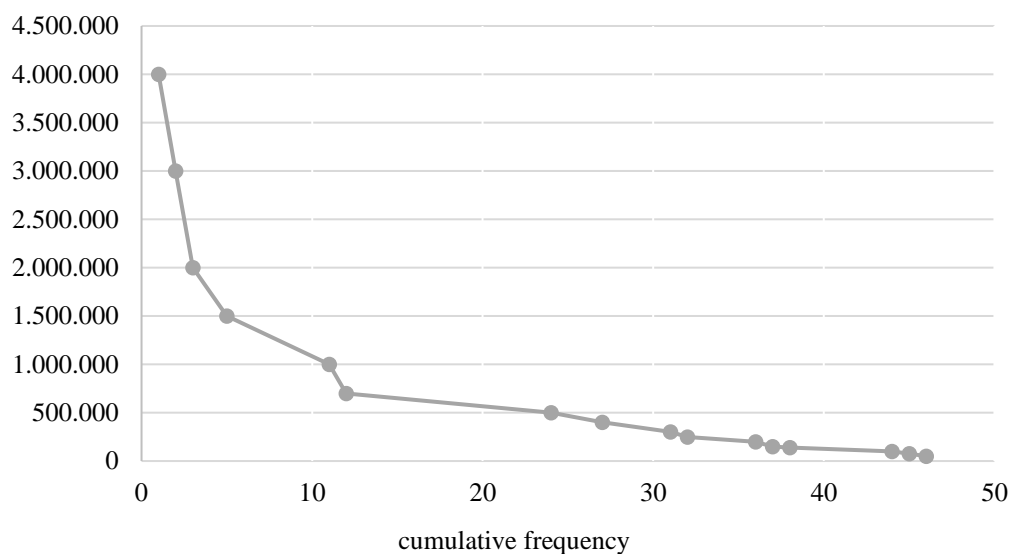


Figure 5. Demand Curve of WTP for Old-Age Security

Source: Primary Data, 2021 (Data processed)

Based on Figure 5, the demand curve for WTP for Old-Age Security shows a negative slope, meaning that the higher the WTP value of the respondents, the lower the cumulative frequency of the number of respondents willing to pay. As the law of demand, the higher the price of a good or service, the quantity demanded will decrease and vice versa.

Chi-Square Test

The analysis in this study is a cross-tabulation used to determine the effect of the independent variables (age, information, income, occupation, and the number of family members) on the dependent variable (WTP for old-age security) using the chi-square test ($\alpha=0,05$). The bivariate analysis results using the chi-square test are represented in table 4.

The age variable shows a p-value = 0.001 ($p < 0.05$), meaning there is an effect between the age variable on the WTP for Old-Age Security. The older the respondent, the lower the WTP. Because the minimum Old-Age Security membership period in BPJS Ketenagakerjaan is ten years, preparations must be planned long before entering old age. In line with Aryani and Muqorrobin's (2013) research, the age variable shows an inverse relationship with WTP. The older a person gets, the more their need for other goods increases, so they will reduce the need for insurance. Likewise, Sunarjito and Wibowo (2014) and Entorf and Jensen (2020), in their research, concluded an effect between the age variable and WTP.

The information variable shows a p-value = 0.088 ($p > 0.05$), meaning there is no effect between the information variable and the WTP for Old-Age Security. Whether the respondent is knowledgeable or not about Old-Age Security, does not affect the respondent's WTP. Similarly, in research conducted by Novianty (2013), the level of knowledge of respondents does not affect WTP.

The income variable shows a p-value = 0.705 ($p > 0.05$), meaning there is no effect between the income variable on the WTP for Old-Age Security. That is, the respondents' income level does not affect the WTP. Research by Harapan et al. (2017) and Nguyen and Hoang (2017) also show that income does not affect WTP.

The occupation variable shows a p-value = 0.02 ($p < 0.05$), indicating an effect between the occupation variable and WTP for Old-Age Security. White-collar jobs are non-manual jobs that deal with information, specialized experience, and rigorous education. In contrast, blue-collar work involves manual work that requires physical effort and the technical skills of formally trained and certified personnel. Based on the tabulation, known that "white-collar" respondents are more willing to pay (59%) compared to "blue-collar" respondents (35%).

The number of family members variable shows a p-value = 0.013 ($p < 0.05$), indicating an effect between the number of family members variable and the WTP for Old-Age Security. Respondents who do not have dependents have a higher willingness to pay because the more dependents, the more life needs must be met so that the number of family members becomes a

person's consideration in making decisions. As with research conducted by Witati and Putri (2020) and Lestari and Aliasuddin (2016), the number of family members has an inverse relationship with WTP. The larger the household size, the heavier the burden on the household to meet their daily needs, and hence, it will reduce the WTP of the respondent.

Table 4. Bivariate Analysis (Chi-Square Test)

Variable	Value	df	Asymp. Sig. (2-sided)
Age	16.905	3	0,001
Information	2.913	1	0,088
Income	0,143	1	0,705
Occupation	5.421	1	0,02
the Number of Family Members	14.439	5	0,013

Source: SPSS Output Data, 2021

The results of the multivariate analysis in table 5 show that age, income, and respondents who know information about Old-Age Security affect the WTP for Old-Age Security. Sufficient information and level of knowledge are considerations for individuals in determining their willingness to pay, meaning that the information capacity can influence a person's preferences. According to Nguyen and Hoang (2017), knowledge about insurance benefits is a common factor affecting WTP and the population's desire to become insurance participants.

The income variable will affect the WTP for Old-Age Security if the respondent knows about it, both from the side of the respondent whose income is below the minimum wage ($p = 0.00$) or above the minimum wage ($p = 0.01$). Based on research by Thi Thuy Nga et al. (2018), there must be a positive relationship between income and WTP following the theory of demand in economics.

Table 5. Multivariate Analysis (Chi-Square Test)

Income	Information	Value	df	Asymp. Sig. (2-sided)
Below Regional Minimum Wage	Unknowledgeable	4339	3	0,227
	Knowledgeable	18302	3	0,000
Above Regional Minimum Wage	Unknowledgeable	3750	3	0,290
	Knowledgeable	11446	3	0,010

Source: SPSS Output Data, 2021

5. Conclusion and Recommendation

Conclusion

Old-Age Security (JHT) is one of the social security programs for workers as a protection in the retirement age. However, the current affordability of old-age security is still limited. This study aims to estimate the value of Willingness to Pay (WTP) for old-age security and analyze factors that affect the WTP of Old-Age Security in Banda Aceh. The results reveal the average amount of JHT that people are willing to pay is IDR 634,074/month. The lowest and highest amounts that people are willing to pay are IDR 50,000/month and IDR 4,000,000/month respectively. It is affected by the determinants of the WTP for Old-Age Security, which are age, occupation, and the number of family members. Whilts, income and information do not directly affect WTP. However, the results of the multivariate analysis show that age, income, and knowledgeable respondents affect the WTP for Old-Age Security. In sum, people's willingness to pay can be influenced by several factors, both directly and indirectly.

Recommendation

The level of awareness among the people of Banda Aceh city regarding Old-Age Security is relatively low. Therefore, cooperation between the government and BPJS Employment is needed to expand the scope of participation through outreach regarding the social security program so that the public understands the benefits of the program.

Furthermore, it is recommended for future researchers to develop this research by adding other variables that have not been studied, such as ability to pay. Particular research can also be conducted for workers with wage levels around the regional minimum wage because this group is vulnerable to economic shocks. Thus, it is necessary to know their preferences regarding Old-Age Security. Particular research can also be carried out on workers with wage levels around the regional minimum wage. Because this class is vulnerable to economic shocks, it is necessary to know their preferences for Old-Age Security.

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