Journal of Multidisciplinary Healthcare

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ORIGINAL RESEARCH

Factors That Influence the High Number of Elderly People Working in the Informal Sector

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Aim: As individuals age, they are expected to experience a natural progression that usually involves a slight and permanent decrease in bodily functions and physical abilities. Despite this, many older people remain active in the workforce.

Purpose: This study seeks to explore the correlation between the health conditions, disabilities, social factors, and demographic circumstances of elderly individuals engaged in both formal and informal employment sectors.

Methods: This study utilizes an observational analytical method with a cross-sectional structure. The participants in the research involved all individuals aged 60 years and above who met the outlined criteria, totaling 15,034,946 respondents. The data analysis was conducted using multivariate logistic regression in Model II.

Results: Overall, most older adults are working in informal jobs. Moreover, most respondents are 60–69 years old, married, have a primary school certificate, own health insurance and a house, and live with family. In addition, the multivariate analysis shows the relationship between each variable and the informal sector working elderly. It is known that older women have a 1.45 times higher limited educational background, not having savings is 1.21 times, rural areas living 1.93 times, not being the head of the family is linked 1.34 times, poor health conditions are 1.01 times, and having a disability has a 1.20 times higher likelihood of informal-sector employment.

Conclusion: Several variables are assigned as the determinants that increase the number of elderly working in informal sectors, including gender, education level, savings ownership, living areas, head of the family role, health status, and disability.

Keywords: determinants, elderly, informal, sector, work

Introduction

The aging population is a global demographic phenomenon that cannot be ignored, including in Indonesia.[1] This is primarily due to a decrease in fertility and mortality rates, which impact the increase in life expectancy. These changes will lead to shifts in the population structure, with people living longer.[2] The percentage of the elderly population continues to rise, from 9.92% in 2019 to 10.82% in 2021, and 10.48% in 2022. From a demographic perspective, elderly women constitute a larger share (51.81%) of the total elderly population, while men make up 48.19%.[3] The ASEAN REPORT has also noted that the population in Southeast Asia is aging. Due to the rising life expectancy of women, the majority of the elderly population consists of women.[4]

The condition of the elderly population tended to increase during the period of 2020, 2021, and 2022, especially in Indonesia. The total population of the elderly continues to rise; the percentage of the elderly population in the workforce is increasing and the elderly population working in the informal sector is also on the rise. Based on the condition of the elderly population working in the informal sector, it has sparked the interest of researchers to investigate further. Moreover, a multiple logistic regression analysis showed that the most dominant independent variable in affording the elderly population the opportunity to work was the disability variable ($p<0.05$). Population with disability is a description

Received: 24 November 2023
Accepted: 25 March 2024
Published: 23 April 2024

of an inability that exists both physically and mentally, causing limitations in an activity. Elderly people who do not have disabilities are 14.7 times more likely to be able to work compared to elderly people who have disabilities. This is supported by the results of Triana's research conducted in NTB which showed that the variable that had the greatest influence on the elderly workforce was the health status of the elderly.[5] Montero explains that elderly people who have physical activity and are healthy have a tendency to have better daily performance, especially at work.[6] The health aspect contributes positively to the elderly population to remain productive. This is explained in detail in the WHO concept.[2] On the other hand, elderly people with disabilities tend not to work due to declining health conditions as a result of the lack of physical activity to support their health.[7–10]

The current challenge is that the elderly population continues to grow, reaching 52.55 years in 2022, up from 51.04 years in 2020. Similarly, the percentage of the elderly population working in the informal sector continues to rise, reaching 86.19% in 2022, up from 85.83% in 2020.[3] Elderly women are more likely to work in the informal sector compared to elderly men, with percentages of 90.25% and 82.57% in 2020, 90.41% and 83.21% in 2021, and 90.22% and 83.63% in 2022, respectively.[3]

The aging process is a natural occurrence typically accompanied by a gradual and irreversible decline in physiological functioning and physical capabilities.[11] Nevertheless, a considerable number of elderly individuals continue to work. The findings from the August 2022 National Labor Survey indicate that 52.55% of elderly individuals are still engaged in work. This is evident from the rising trend in the percentage of working elderly individuals from 2013 to 2022. Within a decade, the percentage of working elderly individuals has increased by 6.22%.[3] In addition, it is known that, beyond two categories of job, formal and informal job, the number of elderly working in informal jobs in Indonesia is increasing each year. The percentage of the elderly population working in the informal sector continues to rise, reaching 86.19% in 2022, up from 85.83% in 2020.[3] The same condition also applies in India with research showing that the majority of this demographic participate in informal endeavors, constituting approximately 73% of the entire elderly population.[12] The study also found that informal workers face a significant risk of experiencing poor cognitive functioning (PCF), whereas formal workers are more likely to contend with chronic health conditions (CHC) and functional limitations (FL).[13] Ideally, the work undertaken by elderly individuals should align with their physical well-being. Accordingly, it is possible to achieve the third Sustainable Development Goal (SDG), which focuses on ensuring a healthy life and promoting the well-being of individuals of all ages, including the elderly.[14]

There are various reasons why elderly individuals continue to work, including the necessity to meet their financial needs. The absence of non-labor income, such as pension benefits, often compels the elderly to remain in the workforce.[15] Other research suggests a connection between employment and the quality of life for the elderly.[16] Working in one's senior years can have a positive impact on mental health.[17] Furthermore, regarding health, several studies have found that elderly individuals who remain in the workforce tend to have better overall health.[18] There are differences in the working atmosphere of those who work in the formal and informal sectors in terms of the nature of employment, which affects health, including elderly workers. In the formal sector, the nature of employment includes the period of employment, the employment status of the employee (which may be regular or probationary), the purpose of the job, the responsibilities attached to it, and the performance requirements. Meanwhile, working in the informal sector, such as trading and farming, workers are self-employed who are not bound by regulations. Working in the informal sector tends to be more peaceful and, therefore, has a positive impact on mental health. The health of elderly people who are still working is correlated with the type of work they do. Research in Japan found that work stress, frailty and sleep quality influence the health of elderly workers.[9] In line with the age and physical abilities of the elderly, the percentage of elderly people working in the informal sector is greater than those working in the formal sector. Other research shows that, although employment rates for men and women decline after retirement age, many elderly people continue to work, with employment rates and working hours remaining high, especially for men as heads of household.[19] Moreover, a significant degree of involvement in the informal sector is noticeable within the elderly population characterized by limited education and financial resources. This substantial labor force predominantly finds employment in agricultural tasks, casual labor, or unskilled occupations that demand lower levels of education.[13] Demographic factors such as age, marital status, gender, household role, and working hours are linked to why older individuals continue working.[20] Given

this background, from a demographic perspective, there has been an increase in elderly individuals in the workforce, despite the fact that they are typically considered an unproductive segment of the labor force.

There are many important things that need to be explored more deeply about the elderly population still working in the informal sector because this research has a limited scope, especially related to limited variables. For example, elderly people with low health status have a great opportunity to work. The question arises, who are these people? How are the social, demographic, and health status characteristics, including physical condition (disability or non-disability), of the elderly population? Is there a correlation between these variables and the elderly population who are still working in the informal sector? What are the primary factors that lead them to work, particularly in the informal sector? This research aims to obtain the relationship between health status, disability, social, and demographic conditions with the elderly population aged 60 years and above who are working in the formal and informal sectors.

Materials and Methods

Study Methods

This research employs an observational analytical approach with a cross-sectional design. Its objective is to obtain the relationship between health status, disability, social, and demographic characteristics and the employment status of elderly individuals in formal and informal sectors in various cities in Indonesia. This research employs cross-sectional data because all variables are measured and observed at the one period in time. A cross-sectional design is used to clearly obtain the prevalence or an overview of the characteristics of specific populations in particular moments. Further, this study can be followed by predicting the risk of this specific population.

The study is based on secondary data analysis, utilizing information from the March 2021 National Social Survey (SUSENAS March 2021), which was conducted by the Central Statistics Agency (BPS). The March 2021 Socio – Economic National Survey (Susenas) was carried out in all of Indonesia's provinces (34 provinces) with a sample size 345,000 households in 514 district/municipalities, excluding households belonging to a specific census block and specific households such as orphanage, residence hall, dormitory, hostel, prison, military barracks, and the like, even if they are located in the ordinary block census. The March 2021 Socio-economic National Survey (Susenas) data were large enough to produce district/municipality level estimates so long as no urban rural classification distinction was made.

Some variables or indicators generated from the March 2021 Socioeconomic National Survey include: school enrollment and literacy rates for education; morbidity; utilization of health facilities; health insurance; a two years old baby breastfeeding; immunization for health; birth attendants; age at first marriage; fertility; participation in family planning program; the average number of children born; living conditions such as a source of water for drinking, cooking, bathing and washing, and housing areas; ownership of HP; internet access and the use of information technology; and aid/government programs for the welfare of society.

Ethics Approval

The study data were obtained from the March 2021 National Social Survey which was conducted by the Central Statistics Agency (BPS). The BPS is an Indonesian non-departmental government agency in charge of conducting statistics surveys. In addition, the BPS operates in accordance with the provisions of the Republic of Indonesia Law Number 16 of 1997, specifically outlined in Article 21. Furthermore, the BPS has placed legal restrictions on the public sharing of data.

This study's datasets are available under a license agreement between the Statistical Dissemination of Statistics Indonesia (BPS) and the Center for Research and Development of the National Population and Family Planning Board (BKKBN), No.48/LADU/0000/12/2020, provided without personal identifiers such as name and address. However, four authors, Syahmida S. Arsyad, Rindang Ekawati, Muhammad Dawam, and Rahmadewi, are working as part of the research and development of the Development of the National Population and Family Planning Board (BKKBN); therefore they are legally entitled to ensure and review the ethics. As a result of the confidentiality of the dataset, it is, therefore, not required to obtain ethical approval for this study. The research adhered to the guidelines set forth in the Declaration of Helsinki. All participants provided informed consent, with a guarantee of the confidentiality and anonymity of their personal information.

Participants of the Study

In this study, the research participants comprised all elderly individuals aged 60 years and older who met the specified criteria. Thus, based on secondary data, a total of 15,034,946 respondents were obtained. The dependent variable focused on employment status, categorized as either employed or not employed, following the BPS definition of work as any economic activity conducted with the intention of generating income or profit. In specific, respondents who are categorized as formal workers are company employees, or servants and elderly having their own company with paid laborers or as paid laborer themselves, while informal workers are elderly having their own company, self-employed, freelancer, or unpaid laborer. Additionally, various aspects of work for the elderly, such as work sectors (formal, non-formal) and types of work (retired, etc.), were considered. Meanwhile, the independent variables encompassed health and disability, and socio-demographic characteristics of the elderly, including age, gender, marital status, education, health insurance ownership, house ownership, savings ownership, living arrangements (alone or with children/family), residential area (adjusted), and relationship with family's head. The dependents and independents variable can be seen in Figure 1.

Data Analysis

Data analysis involved the processing and examination of data using the Statistical Package for Social Sciences Program version 20 (IMB Inc.). Descriptive data presentation included univariate analysis (frequency) to depict all the variables used in the study. Subsequently, binary logistic regression analysis in Model I, along with odds ratios (OR) and 95% confidence intervals (CI), represents a bivariate analysis to identify the relationships between digital literacy, demographic characteristics of the elderly, and the well-being of the elderly on a bivariate basis. Only significant independent variables with a probability value below 5% were included in the multivariate logistic regression, allowing for the assessment of associations with the outcome while controlling for other variables within the model. Furthermore, Model II analysis was carried out using binary logistic regression, which represents multivariate analysis. This is aimed at finding out the factors that influence the well-being of the elderly, with the Adjusted Odds Ratio (AOR) and 95% confidence interval (CI) at a significance level of p. <0.05.

Results

The study found wide variation between all indicators among Indonesian elderly. Overall, the majority of the elderly are working on informal job. Moreover, most of the respondents are 60–69 years old, married, primary school graduated,

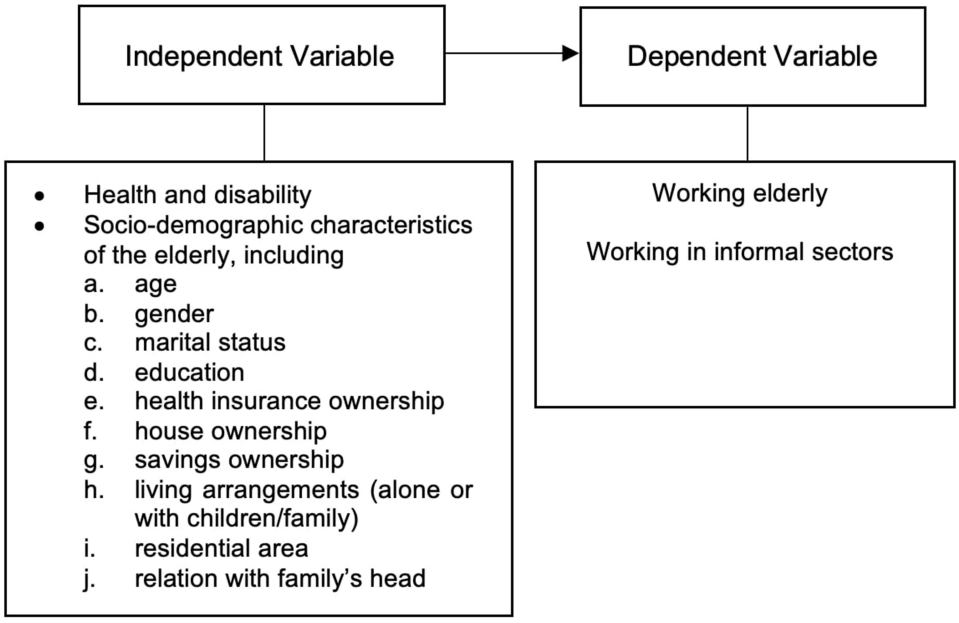

Figure 1 Research variable framework.

owning health insurance and house, and living with family. Additionally, most of the respondents are healthy and not disabled. Further details on respondent characteristics are shown in Table 1.

Based on the bivariate analysis in Table 2, it was found that, of all the variables analyzed, there were only three variables that made a significant contribution. These three variables are Ownership of Health Insurance, Living Arrangements, and Health Status.

Meanwhile, the multivariate analysis result shown in Table 3 describes several significant points. Various factors influence informal-sector employment among older adults. Elderly women have a 0.69 times higher likelihood of

Table 1 Respondent Characteristics (N = 15,034,946)

Characteristics	Frequency (N)	Percentage (%)
Working Employment		
Informal	12,348,897	82.13
Formal	2,686,049	17.87
Gender		
Female	5,450,323	36.25
Male	9,584,623	63.75
Age		
60–69 Years	11,187,287	74.41
70–79 Years	3,333,045	22.17
80+ Years	514,614	3.42
Marital Status		
Not Married	142,843	0.95
Married	11,124,401	73.99
Widow/ Widower	3,767,702	25.06
Education		
Primary	11,984,412	79.71
Secondary	2,445,920	16.27
Higher	604,614	4.02
Health Insurance Ownership		
No	4,602,123	30.61
Yes	10,432,823	69.39
House Ownership		
No	947,900	6.30
Yes	14,087,046	93.70
Savings Ownership		
No	10,781,338	71.71
Yes	4,253,608	28.29
Living Arrangements		
Alone	1,492,875	9.93
With Family	13,542,071	90.07
Residential Area		
Villages	8,031,558	53.42
Big City	7,003,388	46.58
Relation with Family's Head		
Not Family's Head	3,794,098	25.24
Family's Head	11,240,848	74.76
Health Status		
Unhealthy	2,947,587	19.60
Healthy	12,087,359	80.40
Disability		
Disabled	742,787	4.94
Not Disabled	14,292,159	95.06

Table 2 Correlation Between Variables (Bivariate) (P<0.05)

Characteristics	Working Employment				Total	%	95% CI of B Value		B value
	Informal		Formal						
	Frequency	%	Frequency	%			Lower Limit	Upper Limit	
Gender									
Female	7,628,494	79.59	1,956,129	20.41	9,584,623	100.00			
Male	4,720,403	86.61	729,920	13.39	5,450,323	100.00	0.369	0.378	0.374
Age									
60–69 Years	9,045,873	80.86	2,141,415	19.14	11,187,288	100.00			
70–79 Years	2,861,792	85.86	471,253	14.14	3,333,045	100.00	−0.317	−0.310	−0.313
80+ Years	441,232	85.74	73,381	14.26	514,613	100.00	−0.236	−0.220	−0.228
Marital Status									
Not Married	106,269	74.40	36,574	25.60	142,843	100.00			
Married	9,124,109	82.02	2,000,291	17.98	11,124,400	100.00	−0.447	−0.422	−0.435
Widow/ Widower	3,118,518	82.77	649,184	17.23	3,767,702	100.00	−0.294	−0.268	−0.281
Education									
Primary	10,157,973	84.76	1,826,439	15.24	11,984,412	100.00			
Secondary	1,818,011	74.33	627,908	25.67	2,445,919	100.00	0.341	0.348	0.344
Higher	372,912	61.68	231,702	38.32	604,614	100.00	0.897	0.909	0.903
Health Insurance Ownership									
No	3,838,633	83.41	763,491	16.59	4,602,124	100.00			
Yes	8,510,264	81.57	1,922,558	18.43	10,432,822	100.00	−0.029	−0.022	−0.025
House Ownership									
No	693,342	73.15	254,558	26.85	947,900	100.00			
Yes	11,655,555	82.74	2,431,491	17.26	14,087,046	100.00	−0.378	−0.368	−0.373
Savings Ownership									
No	9,076,608	84.19	1,704,730	15.81	10,781,338	100.00			
Yes	3,272,289	76.93	981,319	23.07	4,253,608	100.00	0.191	0.197	0.194
Living Arrangements									
Alone	1,227,767	82.24	265,108	17.76	1,492,875	100.00			
With Family	11,121,130	82.12	2,420,941	17.88	13,542,071	100.00	−0.030	−0.019	−0.024
Residential Area									
Villages	7,027,967	87.50	1,003,591	12.50	8,031,558	100.00			
Big City	5,320,930	75.98	1,682,458	24.02	7,003,388	100.00	0.653	0.659	0.656
Relation with Family's Head									
Not Family's Head	3,332,674	87.84	461,424	12.16	3,794,098	100.00			
Family's Head	9,016,223	80.21	2,224,625	19.79	11,240,848	100.00	0.285	0.294	0.290
Health Status									
Unhealthy	2,425,466	82.29	522,120	17.71	2,947,586	100.00			
Healthy	9,923,431	82.10	2,163,929	17.90	12,087,360	100.00	0.004	0.010	0.007
Disability									
Disabled	639,679	86.12	103,108	13.88	742,787	100.00			
Not Disabled	11,709,218	81.93	2,582,941	18.07	14,292,159	100.00	0.176	0.190	0.183

engaging in informal-sector employment compared to elderly men. Seniors aged between 70 and 79 years are 1.37 times more inclined to work in the informal sector than those aged 60–69. Similarly, elderly individuals aged 80 and above are 1.26 times more prone to informal-sector work than those in the 60–69 age group. Being married increases the chances of elderly individuals working in the informal sector by 1.54 times when compared to their unmarried counterparts. For those who are divorced or widowed, the likelihood of informal-sector employment is 1.32 times higher than for unmarried seniors. Additionally, elderly individuals with limited educational backgrounds are 1.41 times more likely

Table 3 Multivariable Correlation (P<0.05)

Characteristics	*p*-value	95% CI of Exp (B) Value		Exp (B)
		Lower Limit	Upper Limit	
Gender				
Female				
Male	0.00	0.69	0.69	0.69
Age				
60–69 Years				
70–79 Years	0.00	1.36	1.37	1.37
80+ Years	0.00	1.25	1.27	1.26
Marital Status				
Not Married				
Married	0.00	1.53	1.56	1.54
Widow/Widower	0.00	1.31	1.34	1.32
Education				
Primary				
Secondary	0.00	0.71	0.71	0.71
Higher	0.00	0.40	0.41	0.41
Health Insurance Ownership				
No				
Yes	0.00	1.02	1.03	1.03
House Ownership				
No				
Yes	0.00	1.45	1.46	1.45
Savings Ownership				
No				
Yes	0.00	0.82	0.83	0.82
Living Arrangements				
Alone				
With Family	0.00	1.02	1.03	1.02
Residential Area				
Villages				
Big City	0.00	0.52	0.52	0.52
Relation with Family's Head				
Not Family's Head				
Family's Head	0.00	0.75	0.75	0.75
Health Status				
Unhealthy				
Healthy	0.00	0.99	1.00	0.99
Disability				
Disabled				
Not Disabled	0.00	0.83	0.84	0.83

to work informally than those with a secondary education, and this increases to 0.71 times for those with higher education levels. Having health insurance raises the probability of informal-sector employment by 1.03 times, while owning a home increases the likelihood by 1.45 times. On the other hand, not having savings is associated with a 0.82 times higher chance of working in the informal sector compared to those with savings. Seniors living with family members are 1.02 times more likely to be involved in the informal sector compared to those living alone. Residence in rural areas increases the chances of informal-sector work by 0.52 times compared to living in urban areas. Furthermore, not being the head of the family is linked to a 0.75 times higher likelihood of informal-sector employment compared to those who participate in such programs. Poor health conditions slightly raise the probability of working informally by

0.99 times compared to those in good health, and having a disability is associated with a 0.83 times higher likelihood of informal-sector employment when compared to those without disabilities.

Discussion

Based on the study result, it is known that most of the working elderly are working in informal sectors. A research study concludes that, among 112 countries where informal employment serves as the primary occupation, this is linked to varying factors including development levels, social contributions, and poverty rates.[21] These factors are also linked to the result of the bivariate and multivariate analysis.

Globally, in Southeast Asia, the level of informal employment is higher among older workers, especially in Cambodia, Lao PDR, Thailand, Vietnam, and Indonesia. The role of elderly women working in the informal sector is indeed significant, as discussed earlier. Elderly women are more likely to work in the informal sector compared to elderly men.[4] This is further supported by the results of the multiple logistic regression in this study, which indicates that elderly women are 1.45 times more likely to work in the informal sector compared to elderly men.

The higher representation of elderly women working in the informal sector can be explained from the perspective that social policy configurations can influence the distribution of opportunities in various ways, including women's participation in economic life. These disparities can manifest through differences in paid work, the skills and educational qualifications they acquire, and the types of jobs they have access to, as well as variations in the accessibility and effectiveness of social protection. Additionally, women are more frequently engaged in non-standard employment, such as part-time or temporary jobs, self-employment, and unpaid family work.[7] These factors can contribute to the perpetuation of gender-based inequalities. Furthermore, gender disparities in income security during old age are influenced by women's reduced participation in the labor force, lower wages, their substantial representation in informal employment, and the fact that women frequently experience shorter, disrupted careers due to child-rearing and caregiving responsibilities for children and other family members in need. In addition, significant indicators of gender disparities in old age include gender gaps in life expectancy, retirement age, coverage of contributory and non-contributory pension schemes, labor force participation, informal and unpaid family work, as well as educational opportunities.[22]

In the concept of demographic bonus, it is assumed that the number of productive population supports the elderly population, but in reality many elderly people are still working. The 2015 National Labor Force Survey (Sakernas) recorded that half (50.2%) of Indonesian seniors aged 60 years and over were still working. The percentage of working elderly decreases with age.[23] Regarding their income, most elderly workers in Indonesia have very low incomes.[24]

Referring to the type of work, the majority of elderly workers in the formal sector have incomes that are much higher than those in the informal sector. In addition, the majority of self-employed and informal wage workers have very low incomes and are not much different.[24] In order to work in the formal sector, a person must have a high education in accordance with the specified standards. In contrast, the informal sector does not pay attention to educational background. The informal sector is an alternative choice for those who want to work but lack skills and find it difficult to find work in the formal sector. Working seniors are also faced with limited types of jobs, especially in the formal sector. The availability of pension guarantees and education are two things that influence a person to continue working in old age. The level of education is also one of the drivers for elderly people to participate in work or be productive.[25] Compared to elderly people with higher education, elderly people who only have basic education tend to still work in their retirement. With low education, the elderly have been in the informal sector since before they were elderly. This affects the lack of pension security they have. Therefore, when entering older age they continue to work in order to survive and make ends meet, even with low income and long working hours. Another study states that education level also contributed on the raising number of informal jobs employee. The extent of education, gauged by years of schooling, and wage rates exert a notable and positive influence on workers' choices regarding formal and informal-sector employment. This implies that those with advanced education and higher wages are more inclined to be optimal for formal-sector employment over informal-sector work.[26] The study supported the results of multivariate analysis on this study which shows that elderly people with higher education level are 2.47 times more likely to work in the formal sector than respondents with lower education. Therefore, informal workers are the majority because 79.71% of the respondent's education are at the lowest category on this study.

This study found that older people who do not have savings tend to work in the informal sector compared to those who have savings. Elderly people who work in the formal sector, such as lecturers or researchers functional officials whose retirement age is above 60 years, generally have a savings account to save their salary and prepare savings for retirement. Elderly people who previously worked in the formal sector, who are generally highly educated, in their retirement rarely choose to work again. There is a negative relationship between the elderly who graduated from college and re-entering the workforce. It is different with the elderly who work in the informal sector who do not have pensions and whose income fluctuates depending on existing conditions. Elderly people who work in the informal sector are synonymous with poverty. Elderly workers have several limitations such as declining health conditions and low income. This is closely related to poverty. Poor conditions cause them to only be able to fulfill their basic needs and low education is one of the factors that cause elderly people who work in the informal sector to have no savings and being unable to access banking. Formal and informal types of work have different risks to the health of the elderly. Older people who work in the informal sector tend to have a higher risk of suffering from poor cognitive functioning (PCF) than those who work in the formal sector. This PCF condition can affect productivity, wages and subsequently the ability to save.

Research findings indicate that individuals in rural areas, especially rural women, consistently experience lower earnings throughout their working lives compared to their urban counterparts. This wage disparity results in significant income disadvantages in their later years. Moreover, elderly rural residents not only earn less over their lifetimes but also receive reduced social security benefits and have less pension coverage. These inequities in the work history of older rural individuals, in comparison to their urban peers, contribute to higher poverty rates, an increased likelihood of falling into poverty, and greater difficulty in escaping poverty once it occurs. It is evident that older workers face distinct disadvantages when compared to those in their middle-aged years, with particular hardships for older rural inhabitants and women. Statistical models revealed that these disadvantages associated with advancing age persisted, even after considering other influencing factors. Additionally, the results showed that a significant portion of the challenges faced by older rural workers and women can be attributed to factors beyond age, with education being a particularly noteworthy contributor.[27]

This study has the similar result regarding the variable of residential area. The multivariate analysis shows that residence in rural areas increases the chances of informal-sector work by 1.93 times compared to living in urban areas. This is relevant to the recent study which concludes that the level of informal older workers in India is quite considerable in rural areas, whereas urban areas have a significant share of formal workers. The idea also linked to the variable of education. To strengthen the findings, the issue of research methods seems to be quite a concern in the study of elderly people in rural areas. Because of the geographical transformation of agricultural land and based on the experience of elderly people in the region in South China by industrialization and modernization, it has been possible to persuade male elderly residents to open up land in peripheral (rural) areas so as to better understand or open up their lifestyle discourse in preparing for their old age.[26]

Among the elderly who work in the informal sector, it turns out that the elderly who are not heads of households are greater than the elderly who are heads of households, namely 87.84% compared to 80.21%. This is probably because working informally is related to the characteristics of the elderly such as age, gender, marital status, and place of residence. Furthermore, there is a relationship between the status of the elderly as the head of the household and working in the informal sector. This means that the elderly who are not the head of the household have a tendency to work in the informal sector 1.34 times compared to the elderly as the head of the household. This may be because the elderly who are not the head of the household are the majority of elderly women who work in the informal sector or the elderly men or women live with children or other family. In addition, economic factors require the elderly to work in the informal sector even though they are not the head of the family.[19]

Due to the flexibility access of informal sectors job, informal jobs are popular for some groups. For instance, groups of the aged, the disabled, and the sick members of the family are eligible to work in the informal sector. In recent times, however, Westernization, education and social mobility have put strain on the extended family so that people begin to shift their attention from the extended family toward self-preparedness to live; thus, without relying on any one at an old age or uncertainty times like sickness and disability. This pushes the disabled elderly to keep working, especially in informal sectors which are easier to apply. Therefore, the reason is related to the fact that disabled older aged are more likely to work. It can be seen by the multivariate analysis result which shows that having disability is associated with a 1.20 times higher likelihood of informal-sector employment when compared to those without disabilities. Along with

the disability variable, poor health conditions slightly raise the probability of working informally by 1.01 times compared to those in good health. An analysis of the association between employment status and health among British adults with and without intellectual impairments supports the issue by picturing that people with intellectual disability and borderline intellectual functioning had markedly lower employment rates and poorer health than other participants at all waves of its data collection. The results indicate that, compared to participants in full-time employment, the prevalence of poorer self-rated health and mental health was higher among participants with and without intellectual impairment who were in either part-time employment or were economically inactive at all ages.[28]

The limitations in this research relate to the type of data used. The data in our study are secondary, in that we cannot change the operational definitions used. So, we use available data and analyze according to data availability. Therefore, the results of this research can be a recommendation and illustration for policymakers to consider increasing protection for elderly people who work in the informal sector, maintaining the quality of life of the elderly and creating elderly-friendly policies.

Conclusion

Indonesia has a high number on working elderly. Moreover, the majority of working elderly are working in informal sectors. Based on the bivariate and multivariate analysis, this issue is related to some determinants, which include the variable of female gender who were having work disparities or low level of education, making them ineligible to apply on formal jobs; not having savings resulted by the lack of pension salary; living in rural areas whereas industrialization is focused in the cities; not the head of the family, which might be related to the gender variable; and low health status and disability to be able to not rely on others. This study might be a recommendation for stakeholders to enhance the protection on informal sector working elderly; this includes their health and social protection, as well as socialization and advocacy.

Acknowledgments

The authors would like to thank the National Research and Innovation Agency for the data provision and article publishing charge by Universitas Padjadjaran.

Disclosure

The authors report no conflicts of interest in this work.

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