



# Free Time in Old Age: Does Health Status Determine the Choice of Leisure Activities in Indonesia?

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## Abstract

This paper examines which leisure activities appear more attractive to older people, considering health status, disability and demographic-socio-economic and environmental variables. It employed data from Survei Penduduk Antar Sensus (SUPAS), the nationwide survey, conducted in 2015 by Indonesia's national statistical office. The sample selected 228,718 individuals aged 60 years old and above. Leisure activities were differentiated between active, sedentary, and no leisure activities. Health is measured with both health status and disability. Disability measures were adopted from Washington Group Short Set on Functioning-Enhanced (WG-SS Enhanced). Our multinomial regression models confirmed that health status was correlated with the choice of leisure activities in old age. Compared to older persons in good health, those reported in poor health without disruption to daily life were more likely to participate in sedentary or active leisure, but those with disruption to daily life were less likely to do so. Older persons with disability were disadvantaged in participating in either passive or active leisure. However, among all selected variables, employment and source of finance had the highest odds ratios and confounded the relationship between health and leisure activity.

**Keywords** Active leisure · Sedentary leisure · Health · Aging population

## Introduction

Many countries are experiencing an aging population, with the global number of individuals aged 65 years and above reaching 727 million in 2020 (United Nations Department of Economic and Social Affairs/UNDESA Population Division, 2020).

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This number is projected to more than double in 2050, accounting for over 1.5 billion people or 16.0% of the world's population (UNDESA, 2020). The aging population is a result of the reduction in mortality and fertility rates, which means people are living longer. Living longer and maintaining good health in old age can be a major indicator of the quality of life (Spiers & Walker, 2008), and the prerequisite for active aging (WHO, 2002). Remaining active allows individuals to maintain autonomy and independence (Provencher & Poulin, 2020).

Being healthy enables one to participate in various activities including leisure. Leisure is defined as “free or unobligated time, time during which work, life-sustaining functions, and other obligatory activities are not performed” (Leitner and Leitner 2012, p. 3). In old age, leisure can play an important role in improving the quality of life and life satisfaction (Thang, 2005; Spiers & Walker, 2008; Feng, 2020). People in old age are assumed to have more free time due to withdrawal from labor market at retirement age and being free from childbearing responsibilities compared to people at working ages. This can lead to more participation in leisure activities. However, whether the perceived free time in old age will turn into a reality of enjoying leisure will depend on many factors, with health status as a modifiable variable (Chastin et al., 2015; Nimrod & Shrira, 2016). Health-related policies can, therefore, play an important role in making older persons remain active and independent. Other factors, such as age and sex, are non-modifiable determinants, yet both have an important association with the choice of leisure activities in old age (Chastin et al., 2015).

Leisure activities can have both positive and negative impacts on an individual's psychological wellbeing. Studies have shown that more involvement in leisure activities was associated with higher levels of psychological well-being (Nimrod & Shrira, 2016), reduced feelings of loneliness (Teh & Tey, 2019), lower anxiety levels (Kaufman, 1988), and reduced risk of dementia (Wang et al., 2020). However, sedentary leisure activities can lead to social isolation (Leask et al., 2015), obesity (Shields & Tremblay 2008) and negative impacts on morbidity and mortality (Nicolson, Hayes & Draker 2019).

Nevertheless, studies on leisure activities emphasizing the role played by health among older persons are still limited (Chastin et al., 2015). To the best of our knowledge, there has been no such nationwide study specifically examining leisure activities among older persons in Indonesia, the fourth most populous country in the world, which is currently undergoing rapid aging population (Arifin & Hogervorst, 2015; Arifin & Ananta, 2016). This study fills the literature gap by examining the research question of whether health status determines the choice of leisure activity among older persons aged 60 years and above in Indonesia. Specifically, the study aims to identify which leisure activities appear more attractive to older persons considering their level of health status and disability, taking into account demographic variables (age, gender, and marital status), socioeconomic variables (education, employment status and source of financial support) and environmental variable (place of residence). This study utilized the latest intercensal population survey (*Survei Penduduk Antar Sensus /SUPAS*) conducted by the National Statistical Office of Indonesia in 2015. Among other information, this survey collected specific information on the main activities of persons aged 60 years and above, serving as the main data source for examining leisure activities.

## Leisure in Old Age: Literature Review

The activity of older persons is described by three main theories (Howe, 1987; Kleiber, 2016). The first theory, the activity theory, states that older persons should remain active and occupied in their old age to attain life satisfaction. This theory posits a positive psychological relationship between older persons' level of participation in activities and life satisfaction (Knapp, 1977; Diggs, 2008a). As argued by Kleiber (2016), leisure activities are purposeful and provide a sense of life satisfaction. This activity theory is in contradiction with the disengagement theory which posits that older persons may disengage from various activities and disconnect from society due to physical and cognitive decline, disability (Diggs, 2008a), and lesser resources and power (Kleiber, 2016). As people age, they gradually disengage from active participation in leisure activities and shift to more passive leisure activities. Both theories are related to the role theory in which as people age they lose their social roles, and hence become less active or have greater disengagement and ultimately lower their life satisfaction.

The continuity theory suggests that they should continue doing their preferred and valued activities as a means of self-actualization. Older persons tend to maintain their existing leisure patterns and habits that have developed over time. This continuity theory, which takes a life-course perspective as described by Diggs (2008b), emphasizes the importance of maintaining a sense of continuity and stability in leisure activities for older persons. These three theories are all connected to role theory, providing insight into how older persons adjust their participation in leisure activities as they age. Role theory, as described by Barnett (2014), conceptualizes people's everyday activities as expressions of socially determined roles such as mothers, retirees, and grandparents. Roles thus evolve throughout the life course and can be altered by disability. The norms, expectations and duties associated with these roles can influence the types of leisure activities older persons to participate in, as well as how they engage in those activities. Leisure activities in old age have been measured and classified differently in various studies. For example, Dodge et al. (2008) classified leisure activities among the oldest old Japanese into three categories: physical, non-physical, and social activities. Physical activities included such as walking, gardening, and various types of exercises or sports. Non-physical activities mainly consisted of sedentary activities such as listening to the radio, watching television, reading newspapers/magazines/books, playing board/card games, doing arts and crafts, karaoke/singing, travelling, and attending classes. Meanwhile, social activities included talking to neighbors or younger generations, visiting or calling friends or relatives, and volunteering. However, these three categories are not mutually exclusive as some activities, like travelling and volunteering, can involve more physical activities. Other social activities reflect non-physical activities or social engagement and belonging.

Almost similarly, Wang et al. (2020) categorized leisure activities into three groups: physical, mental, and social activities, based on 26 items. However, they did not include watching television in their classification. Teh and Tey (2019) only considered three leisure activities among older persons in China: playing cards/mahjong, watching TV or listening to the radio, and taking part in social activities. Chastin et

al. (2015) defined sedentary or passive leisure as watching television, screen viewing, leisure time sitting and driving.

Gayman et al. (2017) classified leisure activities among older adults in Canada into two groups: sedentary and leisure-time physical activities. Activities such as having meals/snacks, reading, socializing, watching television, using a computer, passive travel, and sleeping during the daytime are considered sedentary. However, Ferrari et al. (2020) conducted a study among Latin Americans aged 15–65 years old and defined sedentary activities as using a computer at home, videogame, reading (books/magazines), socializing with friends or family, listening to music/CD/radio, talking on the telephone; and watching television at home, and spending time inside a motor vehicle. These studies have shown different definitions of leisure activities, recorded through cross-sectional surveys using self-reporting.

Other studies not only asked about the type of activities but also quantified leisure activities by asking how many hours the respondents spent in a series of activities (Lee et al., 2019), or in terms of metabolic equivalent of task / MET (Gayman et al., 2017). Gayman et al. (2017) defined sedentary activities as when the MET value was equal to or less than 1.5. These activities included watching television, reading, snacking, using a computer, passive travelling (not driving), socializing, and sleeping. On the other hand, active leisure activities include physical activities such as sports activities that included swimming, hockey, tennis, yoga, hunting, boating, camping, horse riding, walking, jogging, hiking, and others (Gayman et al., 2017). Chang et al. (2014) have also defined household activities such as gardening, cleaning, or home improvements as leisure activities for older adults.

Sufficient evidence has noticed the passivity of older persons (Arifin, Braun & Hogervorst, 2012; Chastin et al., 2012; Chastin et al., 2015; Leask et al., 2015; Tam-Seto et al., 2016; Nicolson et al., 2019). Passive activities among older persons have significant impacts on their physical, psychological, social, and spiritual well-being (Nimrod & Shrira, 2016). Meanwhile, active leisure activities bring many benefits to older persons, such as the prevention of dementia (Verghese et al. 2003; Wang et al., 2020), preserving cognitive function, physical function, and mental health (Sala et al., 2019). Leisure activities can also help better adjustment to life during the retirement period (Lee et al., 2019). Leisure satisfaction brings happiness and peace (Spillers & Walker, 2008).

Determinants of sedentary activities, based on studies from mainly European countries (Chastin et al., 2015), can be categorized into three main groups: individual, interpersonal, and environmental variables. Individual variables related to sedentary activities include age, sex, marital status, employment, retirement status, educational attainment, and health. Interpersonal variables included loneliness and perception of neighborhood. The characteristics of the environment in which someone lives, including the presence of cultural facilities, availability of green spaces, and the quality of housing, are all considered environmental variables that can relate to sedentary activities. Socio-demographic characteristics, such as sex, age, ethnicity, and education, are associated with sedentary activities (Ferrari et al., 2020), which the likelihood of participating in sedentary activities was higher among men, younger adults, and those with higher education compared to their respective reference group. Regarding ethnicity, the likelihood of participation in sedentary activities was lower

among white/Caucasians than other groups. Tam-seto, Weir & Doga (2016) found that physical health can be both discouraging and promoting sedentary activities. Weakness of the knee, suffering from arthritis, and low back pain promote sedentary activities. On the other hand, older persons with physical limitations but able to walk tend to be discouraged from sedentary activities and motivated to participate in active life.

## Data and Methods

### Data

The analysis was based on the cross-sectional nationwide intercensal population survey (Survey Penduduk Antar Sensus / hereafter called SUPAS) conducted in 2015 by the Indonesia national statistical office (BPS, or Statistics Indonesia). It covered all provinces with total sample accounting for 40,750 census blocks producing 652,000 households using stratified random sampling. (Badan Pusat Statistik, 2015). Data collection was administered by face-to-face interviews, involving trained interviewers who were regional staff at the district level and appointed partners. The survey collected basic information from all ages of selected households, and from certain age groups for specific issues such as births, deaths, maternal deaths, employment, housing facilities, internal migration/mobility, disabilities, and others. The questionnaire also collected an additional information dedicated to older persons (60 years and above) asking about their sources of monetary and non-monetary support, perceived income adequacy, health status, and activities in the past month before the survey. This section was the main source of data for this paper, combined with information on disability and the basic characteristics of respondents. The sample for this study comprised 228,718 individuals aged between 60 and 95 years old, or 9.4% of the total sample.

### Measurement

#### Dependent Variable

As discussed earlier, a body of studies has defined leisure activities broadly and widely. This means that questions to ask about leisure activities are not standardized across studies and countries. The Sensus Penduduk Antar Sensus (SUPAS) survey used in this study asked respondents about 9 different activities they have engaged in the past month. These activities included watching TV, listening to the radio, reading/writing, travelling/recreation, exercising, participating in social activity, gardening/raising animals, grandparenting, and others. Respondents were asked to indicate whether they had engaged in each activity, with a yes or no answer. Additionally, they were also asked to indicate which of the activity they engaged in most frequently in order to classify the type of leisure activity. "*Aktivitas mana yang paling banyak dilakukan dalam sebulan terakhir? [Which activity that you have engaged in most frequently during the past month?]*". The responses were then classified into

three: active, sedentary or passive, and no leisure activities. Active leisure activities included those who did frequently travelling or recreation, exercising, participating in social activities, and gardening/raising animals. As classified by Gayman et al. (2017) and Ferrari et al. (2020), sedentary or passive leisure activities included watching TV, listening to the radio, reading or writing, and others. Older persons who were mostly grandparenting in the past month were considered as not having leisure activity. In this case, grand-parenting became an obligation, not a leisure activity as defined by Leitner and Leitner (2012).

## Health Status

Health status was measured by 2 variables: health and disability. Quantitative surveys generally measure health status subjectively as perceived by the concerned individuals, which is termed self-rated health (SRH). SRH is mostly a single question which usually takes the form of “In general, would you say that your health is ...?” with a Likert-scale response (Idler & Benyamini, 1997). The response was treated as dichotomous between good and poor/bad health. However, some studies measured SRH with more than one question (Government of Assam, UNDP, 2014; UNDP, 2018). SRH has been considered a good predictor for morbidity and mortality (Jerkovic et al. 2015; Vie et al., 2019; Lore, et al. 2020). This perceived health motivated individuals to seek medical help.

Health status in this study was also self-reported and generated from two questions: one on the presence of sickness or morbidity (“*Apakah mengalami keluhan kesehatan dalam sebulan terakhir? [Did you have any health complaints/symptoms in the past month?]*”); and another to measure the level of sickness or morbidity, (“*Jika ada keluhan, apakah menyebabkan terganggunya kegiatan sehari-hari? [If so, was your daily life disrupted?]*”). These two questions had a yes/no answer. These questions become an advantage and refined measure of health status which differentiates whether those in poor health cannot or can still be functioning in daily life. Therefore, health status was classified into three groups: poor health with disrupted daily life, poor health without disruption to daily life, and good health. Older persons in good health were treated as the reference group in the multinomial regression model.

On disability, Indonesia is one of the signatories to the United Nations Convention on the Rights of Persons with Disabilities and has endorsed Law no. 8/2016 on Persons with Disabilities. The 2015 survey was the first nationwide population survey to collect comprehensive information on disability, adopting the Washington Group Short Set on Functioning-Enhanced<sup>1</sup> (WG-SS Enhanced), as a globally comparable list of questions on disabilities for censuses or surveys. The WG-SS Enhanced included domains such as functional limitations on vision, hearing, mobility, communication, cognition, self-care, upper body, affect (anxiety and depression), pain and fatigue. Each person could experience more than one type of these. The 2015 survey adopted eight questions to measure disability as follows:

<sup>1</sup> [https://www.washingtongroup-disability.com/fileadmin/uploads/wg/Documents/Washington\\_Group\\_Questionnaire\\_3\\_-\\_WG\\_Short\\_Set\\_on\\_Functioning\\_-\\_Enhanced.pdf](https://www.washingtongroup-disability.com/fileadmin/uploads/wg/Documents/Washington_Group_Questionnaire_3_-_WG_Short_Set_on_Functioning_-_Enhanced.pdf).

1. Do you have difficulty seeing, even if wearing glasses?
2. Do you have difficulty hearing, even if using a hearing aid?
3. Do you have difficulty walking or climbing the stairs?
4. Do you have difficulty using or moving your hand and fingers?
5. Do you have difficulty remembering/concentrating?
6. Do you have difficulty controlling emotion or behavior?
7. Do you have difficulty talking and or understanding /communicating with others?
8. Do you have difficulty with self-care or performing daily activities (ADLs)?

Almost all questions had 4 options of answers to detect a different level of difficulty ranging from no difficulty at all, some difficulty, a lot of difficulty, and cannot do at all. The question on walking difficulty was an exception as it had 5 options.

This study was concerned with the existence of impairment/disability, but not with the degree of suffering. Therefore, all of them were dichotomized to differentiate between no difficulty at all (0) and having any difficulty (1). All eight questions were combined to measure overall disability and its values thus ranged from 0 to 8. For the analysis, it was further classified into three groups: multiple disabilities (3–8), some disabilities (1–2) and no disability at all (0).

### Other Independent Variables

Demographic variables included in the study were age, gender, and marital status. Previous studies found that age was one of the important factors in the choice of leisure activities (Chastin et al., 2015; Gayman et al., 2017). In this study, age was treated as a categorical variable with an ordinal level of measurement, and grouped into three categories: young old (60–69), old (70–79), and oldest old (80 years and above) to account for different needs and preferences for activities. Sex was dichotomized as female and male. Marital status was recorded as single, married, widowed, and divorced and then dichotomized as married and non-married (single, divorced, and widowed). In the multinomial logistic regression model, the reference group for the respective variables consisted of the oldest old, male, and non-married.

Socioeconomic variables such as educational attainment, employment status, and source of finance were also taken into consideration in this study. Educational attainment was classified into three categories: (1) no education and incomplete primary, (2) completed primary, and (3) completed secondary school and above. Instead of dichotomizing employment status into two groups as working and not working, the working persons were further disaggregated into self-employed, employee, and unpaid workers.

Source of finance was derived from two questions. The first question inquired about sources of finance (monetary and non-monetary) received since January 2015, including salary/wage, pension, savings/deposits, stocks/securities/bonds, partner (husband/wife), children/children-in-law, relatives, others, and social security. The second question asked respondents to identify the primary source of finance: “From the list, which one was the main source to support your life?” To simplify responses to the second question, financial support was classified into 3 groups to form a new variable consisting of (1) labor and non-labor income, (2) government transfer,



and (3) private transfer. Labor and non-labor income included salary/wage, saving/deposit, and stocks/securities/bonds. Government transfer referred to pension money and social security. Meanwhile, private transfer referred to transfer from a partner (husband/wife), children/children-in-law, relatives, and others. The categories of secondary education and above, not working, and private transfer were the reference group.

Only one variable represented the environmental variable, place of residence. It was differentiated between persons living in rural and urban areas.

## Statistical Methods

A series of statistical data analysis were conducted using SPSS, beginning with a descriptive analysis to examine the frequency distribution of leisure activities, health status and other selected variables. This was done to also identify any incomplete and missing information as the basis for inclusion and exclusion observations. The resulting frequency and percentage distributions guided the re-coding and classifying of the original variables into new transformed variables to be used for further analysis. Since all variables were treated as categorical, the next stage was to use Chi-square tests to examine uncontrolled relationships between the choice of leisure activities and health status, as well as other variables. As leisure activities were categorized into three groups, a series of multinomial logistic regression models (Hosmer et al., 2013) was used to examine the probability of choosing each type of leisure activity as a function of health status, controlling for other variables. In the models, no leisure activity was treated as the reference category. Model 1 first examined the relationship between leisure activity and health status variables only. This was to test the hypothesis of whether health status is significantly associated with the choice of leisure activities. Inspired by Hoekman, Breedveld & Kraaykamp (2017), the next models added control variables according to their grouping in a sequence. This allowed an examination of whether the group of control variables significantly confounded the main relationship between leisure activity and health. Model 2 added demographic variables into Model (1). Model 3 added socioeconomic variables into Model (2). Finally, Model 4 added the environmental variable into Model (3). Model 4, therefore, was the full model for overall interpretation and discussion.

## Results

### Characteristics of the Selected Sample

Among the selected 228,718 respondents aged 60 years and above, their ages ranged from 60 to 95 years old, with a mean of 68.5 years old and standard deviation of 7.4 years old. Age was later treated as a categorical variable consisting of 62.1% young old (60–69 years old), 28.3% old (70–79), and 9.7% the oldest old (80 years and above). Females accounted for 55.4%. Married older persons accounted for 49.3%, and not married 50.7%.



They mainly had low education, meaning no education at all or did not completing primary school (Table 1). More than half (53.6%) were not working. Among those who are working, one-third were self-employed, 9.0% were employees, and 5.3% were unpaid workers. In addition, the respondents mainly relied on a private transfer to support their finance (49.6%) and 38.1% relied on labor income and non-labor income, and a much smaller percentage relied on government transfer. Older persons living in rural areas (60%) outnumbered those in urban areas.

About one in two older persons reported being in good health. Among those in poor health, 30.9% experienced disruption to daily life and 18.5% did not experience disruption to daily life. About 52% did not have any disability. However, 21.6% had more than three disabilities, with 2% having all eight disabilities.

### **Bivariate Analysis of Leisure Activity**

Overall, the study found that almost half of the older persons (46%) engaged in sedentary leisure activities, with the majority (41.1%) spending their time watching television. Meanwhile, 19% of older persons reported not participating in any leisure activities at all. The Chi-square test (Table 2) reported a significant variation ( $p < 0.001$ ) in the choice of leisure activities in relation to health status. Regardless of their health status, around 46% of older persons participated in sedentary leisure activities such as watching television, listening to the radio, and reading or writing. Table 2 shows a positive relationship between health status and active leisure, in which 30.2% who were in poor health with disrupted daily life participated in active leisure, in comparison to 37.6% among those in good health. In contrast, there was a negative relationship between health status and no leisure activities at all.

Disability significantly differentiates leisure activity ( $p < 0.001$ ). Each level of disability had different patterns of leisure activities.

Demographic variables significantly differentiate the choices of leisure activities ( $p < 0.001$ ) with passive leisure accounting for the largest percentage for each group of age, gender, and marital status.

### **Multinomial Logistic Regression Results**

Table 3 provides the results from a series of multinomial logistic regression models presented as odds ratios or  $\text{Exp}(B)$  and their significance level. An odds ratio greater than 1 indicates a positive relationship, while an odds ratio less than 1 indicates a negative relationship. As leisure activities are categorized into three groups, there are two pairs of multinomial regression results, each for passive (Models 1a to 4a) and active leisure (Models 1b to 4b) with no leisure as the reference group.

#### **Sedentary/Passive Leisure**

The results of multinomial logistic regression analysis show that there is a significant relationship between health status and the choice of leisure activity in all models, with a dynamic effect in some groups. Without controlling for other variables, regarding participation in passive leisure activities compared to with no leisure activity,

**Table 1** Characteristics of selected respondents

Variables	Frequency	Percent
<b>Sex</b>		
Female	126,727	55.4
Male	101,991	44.6
<b>Age</b>		
60–69	141,940	62.1
70–79	64,652	28.3
80+	22,126	9.7
<b>Education</b>		
No education and Incomplete primary	129,043	56.4
Primary	58,947	25.8
Secondary and above	40,728	17.8
<b>Place of residence</b>		
Rural	137,331	60.0
Urban	91,387	40.0
<b>Marital status</b>		
Not married	115,896	50.7
Married	112,822	49.3
<b>Employment status</b>		
Self employed	73,217	32.0
Employee	20,669	9.0
Unpaid workers	12,217	5.3
Not working	122,615	53.6
<b>Source of finance</b>		
Labour and non-labour income	87,212	38.1
Government transfer	22,783	10.0
Private transfer	113,472	49.6
<b>Leisure activities</b>		
Active leisure	79,975	35.0
Passive leisure	105,199	46.0
No leisure	43,544	19.0
<b>Health status</b>		
Poor health with disrupted daily life	70,746	30.9
Poor health without disrupted daily life	42,318	18.5
Good Health	115,654	50.6
<b>Disability</b>		
Multiple disabilities	49,425	21.6
Some disabilities	60,561	26.5
No disability	118,732	51.9
Total	228,718	100.0

older persons who were in poor health and experienced disruptions in daily life were less likely (odds ratio/OR=0.765,  $p < 0.001$ ) to participate than those in good health (Model 1a). However, the relationship was not significant for those in poor health without disruptions to daily life ( $p$ -value=0.645).

Disability is another important indicator to measure the burden of unhealthy. Our findings show a significant relationship between disability and passive leisure activities (Model 1a). The odds ratios were smaller for older persons with multiple

**Table 2** Chi-square tests between leisure activities and selected variables

Variables	Choices of Leisure			Total	$\chi^2$ Sig. p
	Active leisure	Passive leisure	No leisure		
<b>Health status</b>					
Poor health with disrupted daily life	30.23	45.65	24.12	100.00	p<0.001
Poor health without disrupted daily life	35.61	46.70	17.69	100.00	
Good Health	37.63	45.95	16.42	100.00	
<b>Disability</b>					
Multiple disabilities	26.71	46.66	26.63	100.00	p<0.001
Some disabilities	35.29	46.21	18.50	100.00	
No disability	38.24	45.61	16.15	100.00	
<b>Sex</b>					
Female	29.85	44.82	25.34	100.00	p<0.001
Male	41.33	47.46	11.21	100.00	
<b>Age</b>					
60–69	37.55	44.56	17.89	100.00	p<0.001
70–79	32.87	47.59	19.55	100.00	
80+	24.52	50.54	24.94	100.00	
<b>Marital status</b>					
Not married	30.39	46.42	23.19	100.00	p<0.001
Married	39.67	45.55	14.77	100.00	
<b>Education</b>					
No education and Incomplete primary	36.27	41.06	22.68	100.00	p<0.001
Primary	36.16	47.92	15.92	100.00	
Secondary and above	29.13	58.85	12.02	100.00	
<b>Employment</b>					
Self-employed	50.45	39.26	10.28	100.00	p<0.001
Employee	43.38	45.86	10.76	100.00	
Unpaid worker	51.63	31.57	16.80	100.00	
Not working	22.64	51.47	25.89	100.00	
<b>Source of finance</b>					
Labour and non-labour income	47.85	42.54	9.60	100.00	p<0.001
Government transfer	26.31	57.96	15.73	100.00	
Private transfer	27.16	46.23	26.60	100.00	
<b>Place of residence</b>					
Rural	40.10	39.02	20.87	100.00	p<0.001
Urban	27.25	56.47	16.28	100.00	
Total	34.97	46.00	19.04	100.00	

disabilities than those with some disabilities (OR=0.69 and OR=0.93,  $p<0.001$ , respectively). This suggests that older persons without any disabilities at all were more likely to participate in passive leisure than those with any disability. Even after controlling for demographic variables (age, sex, and marital status), the relationship between health status and disability, on one hand, and passive leisure activities, on the other hand, remained the same (Model 2a). This indicates that disability is an important indicator in measuring the burden of unhealthy and it has a notable impact on the participation of older persons in passive leisure activities.

Controlling for socio-economic variables (Model 3a), however, the pattern of the relationship was slightly different. Older persons in poor health without disrupted daily life became significantly associated with passive leisure participation (OR=1.045,  $p<0.01$ ). In contrast, older persons with some disabilities became insignificantly associated with passive leisure ( $p=0.298$ ). Given the socioeconomic condition, older persons with some disabilities did not differ significantly from those without any disability in participating in passive leisure. The importance of the place of residence, as an environmental variable, was highlighted by Model 4a, which reversed the significant relationship between disability and passive leisure. Older persons with some disabilities were more likely to participate in passive leisure than those without disability (OR=1.039,  $p<0.01$ ).

**Table 3** Odds ratios of participation in passive or active leisure activities compare to no participation in leisure activity controlled for demographic-socio-economic-environmental variables based on multinomial regression model

Passive leisure / No Leisure	Variable	Model 1a		Model 2a		Model 3a		Model 4a	
		Exp(B)	Sig	Exp(B)	Sig	Exp(B)	Sig	Exp(B)	Sig
	Intercept		0.000		0.000		0.000		0.000
Health status	Poor health with disrupted daily life	0.765	0.000	0.768	0.000	0.842	0.000	0.867	0.000
	Poor health without disrupted daily life	0.993	0.645	1.019	0.259	1.045	0.008	1.032	0.056
	Good health	1.000	-	1.000	-	1.000	-	1.000	-
Disability	Multiple	0.692	0.000	0.727	0.000	0.851	0.000	0.878	0.000
	Some disabilities	0.925	0.000	0.939	0.000	1.015	0.298	1.039	0.010
	No disability	1.000	-	1.000	-	1.000	-	1.000	-
Sex	Female	-	-	0.441	0.000	0.577	0.000	0.572	0.000
	Male	-	-	1.000	-	1.000	-	1.000	-
Age	60–69	-	-	0.979	0.276	0.774	0.000	0.772	0.000
	70–79	-	-	1.085	0.000	0.985	0.447	0.981	0.346
	80+	-	-	1.000	-	1.000	-	1.000	-
Marital Status	Not married	-	-	0.920	0.000	0.945	0.000	0.930	0.000
	Married	-	-	1.000	-	1.000	-	1.000	-
Educational attainment	No education or incomplete primary	-	-	-	-	0.477	0.000	0.575	0.000
	Primary	-	-	-	-	0.685	0.000	0.771	0.000
	Secondary and above	-	-	-	-	1.000	-	1.000	-
Employment status	Self-employed	-	-	-	-	1.054	0.007	1.146	0.000
	Employee	-	-	-	-	1.174	0.000	1.184	0.000
	Unpaid worker	-	-	-	-	0.858	0.000	0.972	0.348
	Not working	-	-	-	-	1.000	-	1.000	-
Source of finance	Labour & non-labour income	-	-	-	-	1.875	0.000	1.858	0.000
	Government transfer	-	-	-	-	1.362	0.000	1.312	0.000
	Private transfer	-	-	-	-	1.000	-	1.000	-
Place of residence	Rural	-	-	-	-	-	-	0.611	0.000
	Urban	-	-	-	-	-	-	1.000	-

**Table 3** (continued)

Active Leisure / No Leisure	Variable	Model 1b		Model 2b		Model 3b		Model 4b	
		Exp(B)	Sig	Exp(B)	Sig	Exp(B)	Sig	Exp(B)	Sig
	Intercept		0.000		0.000		0.000		0.000
Health status	Poor health with disrupted daily life	0.685	0.000	0.708	0.000	0.812	0.000	0.810	0.000
	Poor health without disrupted daily life	0.963	0.024	1.014	0.433	1.054	0.003	1.052	0.004
	Good health	1.000	-	1.000	-	1.000	-	1.000	-
Disability	Multiple	0.494	0.000	0.589	0.000	0.775	0.000	0.771	0.000
	Some disabilities	0.859	0.000	0.906	0.000	0.989	0.487	0.987	0.401
	No disability	1.000	-	1.000	-	1.000	-	1.000	-
Sex	Female	-	-	0.359	0.000	0.544	0.000	0.546	0.000
	Male	-	-	1.000	-	1.000	-	1.000	-
Age	60–69	-	-	1.474	0.000	0.992	0.740	0.993	0.767
	70–79	-	-	1.441	0.000	1.216	0.000	1.218	0.000
	80+	-	-	1.000	-	1.000	-	1.000	-
Marital Status	Not married	-	-	0.810	0.000	0.872	0.000	0.873	0.000
	Married	-	-	1.000	-	1.000	-	1.000	-
Educational attainment	No education or incomplete primary	-	-	-	-	0.878	0.000	0.872	0.000
	Primary	-	-	-	-	0.941	0.008	0.932	0.002
	Secondary and above	-	-	-	-	1.000	-	1.000	-
Employment status	Self-employed	-	-	-	-	2.790	0.000	2.760	0.000
	Employee	-	-	-	-	2.277	0.000	2.275	0.000
	Unpaid worker	-	-	-	-	2.786	0.000	2.748	0.000
	Not working	-	-	-	-	1.000	-	1.000	-
Source of finance	Labour & non-labour income	-	-	-	-	1.902	0.000	1.912	0.000
	Government transfer	-	-	-	-	1.370	0.000	1.370	0.000
	Private transfer	-	-	-	-	1.000	-	1.000	-
Place of residence	Rural	-	-	-	-	-	-	1.042	0.003
	Urban	-	-	-	-	-	-	1.000	-

Demographic variables (age, sex, and marital status) had a significant association with participation in passive leisure among older persons in Indonesia. Women in old age were less likely to engage in passive leisure than men (OR=0.441,  $p<0.001$ ) and this remained significant after controlling for socio-economic and environmental variables and the OR became slightly larger (OR=0.577, Model 3a, and OR=0.572, Model 4a). Furthermore, unmarried older persons were less likely to choose passive leisure than married older persons (OR was around 0.9 ( $p<0.001$ ) in all models). Older persons aged 70–79, as well as 80 years and above, were more likely to participate in passive leisure compared to the young old.

Education showed a positive relationship with the likelihood of participation in passive leisure. Employment and source of financial support showed more important impacts on leisure activities. Older persons who were employed (employees) or self-employed were more likely to participate in passive leisure (OR>1,  $p<0.001$ ), compared to those who were not working (Models 3a and 4a). Older persons who

were unpaid workers had similar likelihood to participate in passive leisure as non-working older persons (Model 4a,  $p > 0.05$ ). Compared to those receiving private transfer (such as from spouse, children/children-in-law, or relatives), older persons having income from labour or non-labour market almost doubled the likelihood of participating in passive leisure (OR  $> 1.8$  in Models 3a and 4a), and those receiving government transfer were 1.3 more likely to participate in passive leisure.

### Active Leisure

Models 1b to 4b depict that health status and disability were significantly associated with participation in active leisure. In all models, older persons in poor health with disrupted daily life were less likely (OR  $< 1$ ) to participate in active leisure compared to those in good health. The dynamics were observed among those in poor health without disrupted daily life and those with some disabilities. Without controlling for other variables (Model 1b), older persons in poor health without disrupted daily life were less likely to participate in active leisure than their counterparts in good health (OR = 0.96,  $p < 0.05$ ). However, this relationship was confounded by the demographic variables. Controlling for sex, age, and marital status (Model 2b), the relationship changed with the likelihood of participating in active leisure became insignificant between those in poor health without disrupted daily life compared to those in good health. Furthermore, socio-economic variables, especially employment status and source of financial support, had stronger confounding effects in changing the relationship. Older persons in poor health without disrupted daily life turned out to be more likely to participate in active leisure than those in good health (OR = 1.054 for Model 3b and OR = 1.052 for Model 4b,  $p < 0.01$ ).

Disability is also significantly associated with participation in active leisure. In comparison to those without any disabilities, older persons with multiple disabilities were the least likely (OR = 0.49,  $p < 0.001$ ) to participate in active leisure, followed by those with some functional disabilities (OR = 0.86,  $p < 0.001$ ) (Model 1b). The patterns were robust when controlled for demographic variables. However, when controlling for socio-economic and environmental variables, the relationship changed, in which older persons with some disabilities or no disability at all were more likely to participate in active leisure than those with multiple disabilities (Models 3b and 4b). Different from passive leisure, employment status had the strongest impact on the likelihood of participation in active leisure. The odds ratios were the highest with its magnitude of more than 2.0 for all groups of employment. Source of finance had also higher odds ratios, 1.912 and 1.370 for each group.

All selected demographic variables were significantly associated with active leisure. Older women and not-married persons were less likely to choose active leisure than their counterparts. Age was significantly associated with active leisure with a negative trend (Model 1b). However, controlling for socio-economic and environmental variables, age seemed to be in a non-linear relationship with active leisure, in which persons aged 70–79 were more likely (OR = 1.2) to be in active leisure than the young old and the oldest old. Urban older persons were more likely to participate in active leisure than their rural counterparts (OR = 1.042,  $p < 0.01$ ).

## Discussion

Our findings revealed that older persons in Indonesia spent their free time mainly participating in sedentary or passive leisure activities. In Indonesia's case, passive leisure included watching television, listening to the radio, and reading or writing. This suggests that older persons' leisure activities were mainly home-bound activities involving minimal physical movement. Our findings align with previous studies on sedentary activities among older persons (Crombie et al., 2004; Arifin, Braun & Hogervorst, 2012; Chastin et al., 2015; Leask et al., 2015; Tam-Seto et al., 2016; Gayman et al., 2017; Nicolson et al., 2019). However, in this study, sedentary leisure activities were not differentiated between passive activities and mentally active activities as defined by Kikuchi et al. (2014). Mentally active activities included reading and using the computer, while passive activities included watching television, listening and talking, and sitting around.

However, a longer duration of sedentary leisure time is positively associated with obesity (Shields & Tremblay, 2008; Chastin et al., 2012). Previous study has shown that the prevalence of obesity in Indonesia has risen over the past two decades (Rahmi, Li & Baur 2017). According to a nationwide survey on basic health (Riskesdas) conducted in 2018, obesity among older persons aged 60–64 years old was 19.3% and 11.9% among those aged 65 years and above (Badan Penelitian dan Pengembangan Kesehatan, 2019).

The strength of this study lies in its use of a population-based survey with a large number of respondents conducted in a representative manner across a giant archipelago which was home to 255.2 million population in 2015, thus minimizing the possibility of underestimation. However, the data used in this study did not collect the time spent and frequency of these passive leisure activities. A study by Livingston (2019) shows that older persons in the United States spent about four hours per day watching television in 2015, an increase of more than half an hour from a decade ago. This is likely to be due to the proliferation of screen consumptions, such as computers/laptops, smartphones, and game devices. In Indonesia, the penetration of such technology has reached about 73.7% recently<sup>2</sup>, and has permeated older persons' lives.

The findings indicate a decrease in the percentage of older persons who watch television (41% out of 46% sedentary leisure activities), compared to Arifin, Braun & Hogervorst (2012). Their study found that in 2005, 74.1% of older women and 70.4% of older men reported watching television as their main daily leisure activities. This change suggests a shift from passive to active leisure activities, especially gardening, although the reason for this increase in gardening is beyond the scope of the study. Our finding that watching television was the most common leisure activity among older persons is consistent with findings in other countries (Kleiber, 2016; Teh & Tey, 2019).

Our findings further examined the pattern or choice of leisure activities in relation to health status measured by both health status and disability. Instead of dichotomizing health status, as used by many (Arifin & Hogervorst, 2015; Ou et al., 2018;

<sup>2</sup> <https://www.thejakartapost.com/news/2020/11/11/indonesian-internet-users-hit-196-million-still-concentrated-in-java-apjii-survey.html>.



Tomioka et al., 2019), this study's strength considered the health impact on their daily life functions. The findings showed that there was a higher percentage of older persons who were in poor health having their daily life disrupted (30.9%) than those who did not have their daily life disrupted (18.5%). This study found that controlling for other variables, health status was significantly associated with the choice of leisure activities. When older persons were in poor health without disruptions to their daily life, they were more likely to spend their time on sedentary or passive leisure than those in good health. This might reflect their indoor ambulation during periods of poor health. As mentioned earlier, watching television in this study was the main contribution to passive leisure activities. In the Indonesian context, a set of television is generally located in the living room where every household member gets together, while televisions in bedrooms are rare. To some extent, this provides opportunities to be socially engaged at home. In other words, when older persons were in poorer health but could still have their daily life as normal, they were similar to healthy older persons in participation of passive leisure. Furthermore, our findings show that older persons who were in poor health with disrupted daily life were less likely to do passive leisure activities than the ones in good health. Morbidity thus matters for participation in passive leisure activities.

Health status is also significantly associated with participation in active leisure activities such as travelling or recreation, exercising, social interaction, and gardening or raising animals. Among these, gardening or raising animals accounted for the highest percentage. Controlling for socio-economic variables and place of residence, these findings implied that older persons in poor health without disruption in their daily life were still able to do gardening or raising animals while those in good health were perhaps doing non-leisure activities. On the other hand, as expected, older persons in poor health with disrupted daily life were less likely to participate in active leisure than the ones in good health. As reported by the 2018 basic health research data (Riskesdas in Indonesia), older persons experienced the highest prevalence rates for hypertension, stroke, and joint disease/arthritis (Badan Penelitian dan Pengembangan Kesehatan, 2019). Other types of older persons diseases included diabetes mellitus, cancer, coronary heart disease, and kidney stones. These diseases pose a higher risk of frailty and prevent older persons from participating in active leisure, hence leading them to passive leisure.

Persons with disability are often perceived as those who are not able to participate in activities. This study finds that 52% of older persons do not have any disability at all. This means one in two older persons had good function of sensory (vision and hearing), good physical function (able to walk or climb the stairs, to move hands and fingers), good cognitive abilities (ability to remember/concentrate, control emotion/behavior and ability to communicate), as well good performance in activity daily living. It is therefore understandable in the context of Indonesia that older persons with one or two functional limitations were more likely to participate in passive leisure than those in good function, as able older persons are possibly occupied with grandparenting as their main activity (Fauziningtyas et al., 2019). Meanwhile, our findings also confirmed that people with multiple disabilities are more likely to participate in passive leisure (Palmer et al., 2019), and less likely to participate in active leisure, such as social activities (Utomo et al., 2019).

Unexpectedly, economic variables have a stronger relationship than health status on the choice of leisure activities. The economic variables (employment and source of finance) were confounding factors for the relationship between health and leisure activities. Having a job may mean having more support financially either in terms of labor income or non-labor income. Ultimately, they have the higher purchasing power to enjoy more active leisure activities, such as travelling/recreation, social activities, or gardening. Our findings are similar to the study by Hoekman, Breedveld & Kraaykamp (2017), in which people with higher income were more likely to participate in active leisure. This highlights the important role played by employment for active and healthy aging. Yet, people working in formal sectors in Indonesia on average retire at the age between 55 and 58 years old. Thus, they retire before they get old, as older persons are defined officially at the age of 60 and above. At the same time, social security coverage in Indonesia is still limited, thus many older persons rely on a private transfer from children, children-in-law, and other family members and friends. In addition, many of them work in the informal sector, especially the agriculture sector. Older persons receiving financial support from private transfer were less likely to participate in either passive or active leisure. In other words, they do not have leisure time. They may be possibly occupied with grandparenting. There is “no” free time in old age for many of them.

## Conclusion

This paper examined the relationship between health and leisure in old age in Indonesia, based on a cross-sectional national population survey conducted in 2015. In particular, it examined which leisure activities were more attractive to older Indonesians, considering degrees of health status and disability controlled with demographic-socio-economic-environmental variables. Very few studies, especially in Indonesia or other Asian countries, have investigated variables associated with leisure activities in old age. This study highlights the importance of health status as one of the determinants on the choice of leisure activities among older persons, including active, passive and no leisure activities. Older persons who reported being in poor health still participated in leisure activities, leaning more towards sedentary leisure than active leisure. The sedentary leisure activities pose challenges to the nurturing of an active aging community as suggested by the WHO (2002). Therefore, reducing sedentary leisure activities is imperative, and can have far-reaching health benefits and psychological well-being (Chastin et al., 2015; Chen et al., 2018).

However, having a job is an even more important determinant than health status for both active and passive leisure activities. Promoting and providing job opportunities for older persons is imperative for their well-being and active life during old age. Hence, having policies that do not prevent older persons from participating in the labor market will benefit the older persons themselves, their families, and society in general, in building active healthy aging communities. Towards such ends, discrimination against older applicants in the labor market should be avoided.

This study has relied on cross-sectional data. As acknowledged by Nimrod and Shrira (2016) such quantitative studies understand the existence of the hypothesized

relationship without knowing the causality. Therefore, in future, it will be important to examine the causal relationship between health and leisure activities, especially as leisure activity becomes increasingly intertwined with the acceleration of aging populations in Indonesia and globally. This will be possible through longitudinal data which will provide opportunities to examine the dynamics of leisure activities in later life. Future studies should thus consider longitudinal studies of older persons' leisure activities, with increased interest in issues of duration, frequency, and activity time. It can be feasible to start with a small-scale survey or accommodate the relevant questions on leisure activities and health to the existing longitudinal survey, such as the Indonesian Family Life Survey (IFLS).

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**Data Availability** The data supporting this study are available on request from the Badan Pusat Statistik.

## Declarations

**Conflict of interest** No potential conflict of interest was reported by the authors.

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