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Physical Functioning Among Community-Dwelling Elderly in Rural Indonesia

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Abstract

Background: As people live longer and the number of elderly individuals increases, caring for the elderly and increasing quality of life become important health care concerns.

Objective: The aim of this study is to assess physical functioning among elderly people in rural Indonesia and draw conclusions about factors that might impact physical functioning.

Methods: This study involved 412 elderly individuals aged 60 and over selected by multistage random sampling. A logistic regression was used to determine factors which associated with physical functioning.

Results: Older age (75+), suffered from chronic illness, and living in low- and middle- income households tend to have limitations on physical function. Also, elderly individuals who had partner and were currently working experienced better physical function than those who did not.

Conclusion: This study supports other findings that say elderly people should do activities that reduce the risk of developing chronic illnesses. Having regular physical activity and routine preventive health check-ups can improve overall health, protect from having diseases and maintain the physical function of the elderly.

Keywords

elderly people, health status, physical function, quality of life, rural area, Indonesia

Background

As people live longer and the number of elderly individuals increases, caring for the elderly and increasing quality of life become important health care concerns.[1] According to the World Health Organization (WHO) projection, the proportion of the world population aged 60 years and older will nearly double from 12% in 2015 to 22% in 2050. In addition, it is estimated that 80% of older people will be living in low- and middle-income countries in 2050.[2] In Indonesia, for example, the average life expectancy has increased from 37.5 years to 68.6 years since 1950. This means people above the age of 65 will make up 14.44% of the Indonesian population in 2035, compared to the 6.68% in 2015.[3]

The elderly are typically more vulnerability for physical and mental disturbances, and the effects of chronic diseases.[4] In addition, aging is also linked with various life transitions, such as retirement and losing family members, friends, or partners, all of which can affect psychological well-being. Loneliness, decrease in sexual activity, chronic illness, and emotional disturbances are also more common in the elderly and can decrease quality of life (QoL).[5,6] QoL is reflective of overall wellness, which results from a combination of physical, functional, emotional, and social factors. Physical functioning is one of most important indicators of health in the elderly, and it is also associated with QoL. Older persons usually experience a significant decrease in maximal aerobic performance due to reductions in oxygen uptake in the muscles, muscle mass generally (sarcopenia), and neural control. These have been linked to the decline of physical functioning in older people as a consequence of aging.[7]

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Although physical functioning usually declines with age, the rate of decline and the particular conditions experienced vary by individual. Also, previous studies have found that the elderly in low- and middle-income countries have a higher proportion of physical function limitations.[8–10] These limitations lead to the problems with maintaining health and well-being of the elderly.[11,12] Indeed, it is especially crucial to determine factors related to physical functioning in the elderly living in rural areas in Indonesia. Higher proportions of elderly individuals (aged 60 and over) live in rural areas than elsewhere in Indonesia, with 1,16,12,232 elderly individuals living in rural areas in 2012.[13] Moreover, older people in rural communities often struggle geographic barriers that requires rural residents to travel long distances to meet their basic needs, such as quality health care, prescription medicines, and healthy food.[14]

Research about older people in Indonesia is available, particularly related to the socio-cultural aspects of aging and support for older people.[15–17] Studies about factors related to QoL revealed that women, unmarried individuals, and people at low educational and socioeconomic levels are more likely to experience poor health outcomes.[18] Several variables such as poor economic, cultural, educational, and health care conditions, as well as a lack of social interaction, have also been found to result in poor QoL in older people.[19] However, information regarding physical functioning and its determinant factors is still limited. The present study was conducted to assess physical functioning among older people in rural Indonesia and draw conclusions about factors that might impact physical functioning. By identifying determinants of physical functioning, health care professionals may be able to provide better treatments and recommendations to support physical functioning in the elderly.

Methods

Study Area

The study was carried out in the district of Banyumas, which located in the southwest of Central Java Province, Indonesia, as shown in Figure 1. The district has a population of 1.85 million inhabitants with an even male to female ratio. The number of the elderly is the highest in the province and most of them live in rural area.[20] The district of Banyumas consists of 27 sub-districts and has 39 community health centers and 331 villages in total. We selected three rural sub-districts for this study (Lumbir, Purwojati, and Gumelar) based on the rural area categorization used by Central Bureau of Statistics, Indonesia.[21] Nine villages in these three sub-districts were selected for this study: Cirahab, Canduk, Lumbir, Klapasawit, Karangmangu, Kaliwangi, Kedungurang, Gumelar, and Samudra.

Study Design

A cross-sectional study was carried out in the district of Banyumas. The population of this study were elderly people aged 60 years and over in the rural area of Banyumas. Three sub-districts which included in rural areas namely Lumbir, Gumelar and Purwojati were selected as location of study. Three villages were randomly selected from each sub-district. A total of 412 elderly individuals were chosen using multistage random sampling.

Figure 1. Study Location.[22] *Note:* The study area is marked with arrow.

Data Collection

A questionnaire was administered to 412 respondents in three sub-districts in the district of Banyumas. Physical functioning was measured by using 10 indicators, namely (1) lifting heavy items (such as a bucket of water) as far as 20 meters, (2) walking 1 kilometer, (3) walking 5 kilometers, (4) sweeping the floor home or yard, (5) bowing, squatting, kneeling, or prostrating, (6) walking across the room, (7) standing alone after sitting on the floor without help, (8) standing alone after sitting on a chair without help, (9) lift the arm up over the shoulder, and (10) take a small coin on the table. Respondents who could to do these 10 activities easily were considered to have good physical functioning. The structured questionaires also requested participant information about age, gender, relationship and working status, education, economic level, individual chronic disease diagnoses, visiting elderly care center, frequency of regular check-ups, and whether participants had health insurance. The relationship status of the elderly was representated by two main subgrups: having partner or no partner. Working status was categorized into to main categories: working and not working. Education was classified into five groups: no formal education, elementary, juniot high, senior high and collage/diploma. Economic level was categorized into five groups: lowest 20%, lower 20%, middle 20%, higher 20% and highest 20%. Finally, visiting elderly care center (*Posyandu lansia*) was categorized into two values: yes or no. *Posyandu lansia* is a community-based health services provided by volunteers or health cadres on a given day in month in neighbourhood level in the village. Respondents with communication difficulties were accompanied by a family member to help the interview process during data collection.

Statistical Analysis

A logistic regression was used to determine which factors were associated with physical functioning. An odds ratio (OR) with 95% confidence intervals (CIs) was used to estimate the risk a certain factor would result in a decline in physical functioning. Associations were considered statistically significant when the p value was less than 0.05. All p values were two sided. All statistical analysis was conducted by using IBM SPSS Statistics 20.

Results

Table 1 shows 75.5% of the participants were female, and 68.9% of all participants were between 60 and 74 years old. Most of the participants only graduated from elementary school (56.3%) and had partners (60.9%). Furthermore, most respondents did not work (53.9%), 45.1% had chronic illnesses, and 73,5% had physical function limitations. Hypertension, arthritis, stomach disorder and diabetes were common diseases among elderly, while limitations in carrying out physical activities such as lifting heavy items, long walks, and daily physical activities occurred more frequently in them as detailed in Figures 2 and 3 respectively.

A logistic regression analysis showed that factors including being 75 years old and older, having partner, working, low economic status, and having chronic diseases were statistically significantly associated with physical functioning of elderly in rural areas (Table 2). Elderly people above 75 years old and older (OR = 2.72, 95% CI = [1.44, 5.15]), chronic illness (OR = 4.05, 95% CI = [2.33, 7.04]), and low economic status (lowest 20%: OR = 4.99, 95% CI = [2.23, 11.18]; lower 20%: OR = 2.89, 95% CI = [1.04, 8.06]; middle 20%: OR = 2.92, 95% CI = [1.32, 6.45]) tended to have limitations on physical function. Otherwise, elderly people who had partner (OR = 0.57, 95% CI = [0.33, 0.99]) and a job (OR = 0.56, 95% CI = [0.32, 0.96]) experienced better physical function.

Discussion

The current study identified determinant factors which related to physical function among community-dwelling elderly individuals in rural Indonesia, and demonstrated that variables such as age, marital status, employment status, economic status, and having chronic diseases influences physical function. The study revealed that elderly individuals 75 years old and older also tend to have chronic illness limitations on physical function. Age affects organ degradation and functioning, and getting older increases the risk of certain health problems. In particular, older adults often have lower cardiovascular and respiratory functions, such as in lung capacity and diastolic blood pressure.[23] The elderly are also more susceptible to chronic diseases resulting from decreased physical functioning. In this study, the most common chronic illness experienced by respondent was hypertension, followed by rheumatism, indigestion, and diabetes. These results were consistent with previous studies, which have found that the most common diseases in older people include diabetes mellitus, coronary heart diseases, osteoporosis, and cerebrovascular disease.[24,25] Some participants in the current study also experienced multiple chronic diseases, with depression, hypertension, and diabetes mellitus commonly clustered with other diseases.[26] Consequently, these chronic illnesses could deteriorate physical function, emotional conditions, and self-esteem, in turn influencing the reduction in the QoL of older individuals.[27,28]

In this study, elderly people who had partner, job, and good economic status experienced better physical function. Several studies have highlighted that relationship status correlates with life satisfaction and QoL.[29,30] Living with a partner is one of the factors that contributes most to life satisfaction[31] and protective factors against depressive symptoms and mental illnesses during late adulthood.[30] Having a partner provides for a social relationship and more support for handling daily activities. Elderly participants with higher economic status in this study also tended to have better

Table 1. Characteristics of Respondents (n = 412).

Characteristics	Category	Frequency	%
Gender	Male	101	24.5
	Female	311	75.5
Age	60–74 years old	284	68.9
	≥75 years old	128	31.1
Education	No formal education	161	39.1
	Elementary school	232	56.3
	Junior high school	8	1.9
	Senior high school	7	1.7
	Collage/Diploma	4	1.0
Marital status	Have partner	251	60.9
	No partner	161	39.1
Job status	Working	190	46.1
	Not working	222	53.9
Economic status (by income level)	Lowest 20%	132	32.0
	Lower 20%	35	8.5
	Middle 20%	85	20.6
	Higher 20%	78	18.9
	Highest 20%	82	19.9
Have chronic disease(s)	Yes	186	45.1
	No	226	54.9
Visited elderly care center (in the past 4 weeks)	Yes	205	49.8
	No	207	50.2
Get regular check-ups (in the past 1 year)	Yes	11	2.7
	No	305	74.0
	Never	96	23.0
Have insurance	Yes	273	66.3
	No	139	33.7
Physical function	No limitation	109	26.5
	Limitation	303	73.5

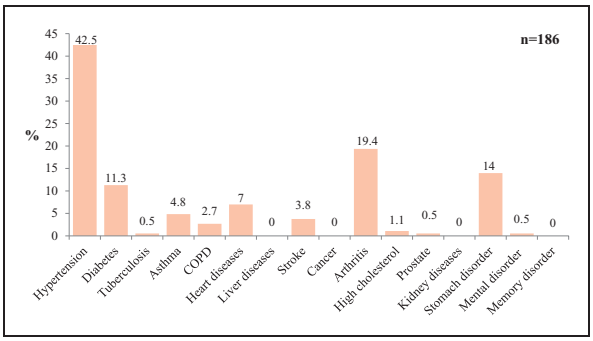

Figure 2. The Distribution of Chronic Disease.

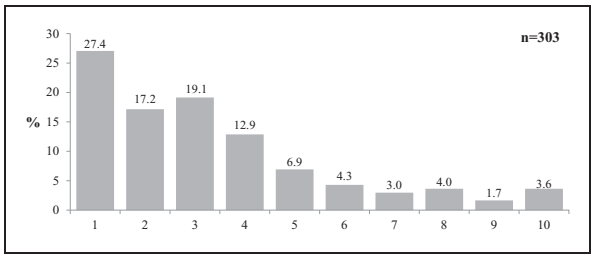

Figure 3. The Distribution of Physical Limitation Level.
Note: 1 = lifting heavy items; 2 = walking 1 km; 3 = walking 5 km; 4 = sweeping; 5 = bowing, squatting and etc.; 6 = walking across the room; 7 = standing alone after sitting on the floor; 8 = standing alone after sitting on a chair; 9 = lifting the arm up over the shoulder; 10 = taking a small coin on the table.

physical functioning, possibly because they had better nutrition and could access better health services, decreasing their risk of developing chronic diseases that can reduce their quality of life.[32,33] Supporting this finding, older people with smaller incomes reported food insecurity, less favorable nutrition, and depressive symptoms.[34] Previous studies have also revealed that older people with lower socioeconomic status have worse health than those further up the social ladder.[35]

This study also identified chronic illness as a modifiable determinant of physical function in older people in rural areas, while age, relationship status, and socio-economic variables were unmodifiable determinants. Therefore, it is important to encourage the elderly to do activities that reduce the risk of developing chronic illnesses. Having a healthy lifestyle, regular physical activity, and better nutrition can improve overall health and protect older people

Table 2. Determinants of Physical Function Among Elderly People (n = 412).

Determinants of PF	OR (95% CI)	*p* value
Male	0.82 [0.43, 1.56]	.542
Age ≥75 years old	2.72 [1.44, 5.15]	.002**
Education (University)		
No formal education	0.64 [0.07, 6.01]	.698
Elementary school	0.80 [0.09, 7.09	.840
Junior high school	0.91 [0.07, 12.32]	.944
Senior high school	2.15 [0.13, 36.32]	.595
Having partner	0.57 [0.33, 0.99]	.046*
Working	0.56 [0.32, 0.96]	.034*
Economic status (Highest 20%)		
Lowest 20%	4.99 [2.23, 11.18]	<.001***
Lower 20%	2.89 [1.04, 8.06]	.042*
Middle 20%	2.92 [1.32, 6.45]	.008**
Higher 20%	1.85 [0.84, 4.08]	.125
Having chronic illness	4.05 [2.33, 7.04]	.000***
Visiting elderly care center	1.16 [0.61, 2.03]	.721
Regular check-up (never)		
Regularly	4.02 [0.40, 40.09]	.236
Irregularly	1.36 [0.73, 2.55]	.333
Having insurance	1.38 [0.81, 2.35]	.237

Note: PF = physical function; OR = odds ratio; CI = confidence interval.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

from having chronic diseases.[27,36] Previous studies have likewise shown that physical health and physical activity are strongly correlated with QoL in older adults.[37] In addition, it is also important to encourage older people to utilize the Integrated Health Post Service for Older People (*Posyandu Lansia*) in order to have routine health checks that can minimize the risk of chronic diseases and enhance their QoL. The Ministry of Health in Indonesia has promoted services namely *Posyandu Lansia* since the mid-1980s to older people. It is community-organized health promotion center at the village level, supervised by staff from the nearest primary health care center to offer health status check-ups and social programs for older people.[18] Results of this study can also provide valuable information for health care providers proving programming for older adults at risk of limited physical function.

There are several limitations of this study. First, the study was conducted in only one district in a specific area of rural Indonesia and had a relatively small sample size. Therefore, the study might not reflect the condition of other elderly people in different socioeconomic areas of Indonesia. Second, the data was collected primarily from elderly individuals who lived with their families. Bias, therefore, may exist related to health status, physical function, and other sociodemographic factors because of family interaction and support. Third, the study omitted critically ill elderly individuals, so their conditions were not mapped. However, these individuals were very few, and their exclusion in this study did not alter the study outcomes.

Conclusion

This study has highlighted factors correlated with a decrease in physical function in community-dwelling elderly individuals: being 75 years old or older, living with partner, working, having a low economic status, and having chronic diseases. It is suggested that elderly people adopt a healthy lifestyle by doing regular physical activity and routine preventive health check-ups in order to minimize the risk of chronic illnesses and maintain physical function. This study also emphasizes the importance of social support from community through community-organized health centers, such as *Posyandu Lansia*, to enhance access to care and improve QoL among elderly people in rural areas.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical Approval

This study was carried out with ethical approval from the Ethical Committee of the Faculty of Medicine at Jenderal Soedirman University, Indonesia. Permission to carry out the study was received from the local authorities in the district of Banyumas. Both verbal and written consent was provided by all respondents to ensure voluntarily participation in this study. The study also maintained privacy and anonymity to ensure participant confidentiality.

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References

1. Shrivastava SRBL, Shrivastava PS and Ramasamy J. Healthcare of elderly: determinants, needs and services. *Int J Prev Med* 2013; 4: 1224–1225.
2. WHO. *Ageing and health*. Geneva: World Health Organization, www.who.int/news-room/fact-sheets/detail/ageing-and-health (2018, accessed 14 August 2018).
3. Statista. *Share of population older than 65 in Indonesia from 2015 to 2035*. Hamburg: Statista, 2018, www.statista.com/statistics/713515/indonesia-aging-population/
4. Khaje-Bishak Y, Payahoo L, Pourghasem B, et al. Assessing the quality of life in elderly people and related factors in Tabriz, Iran. *J Caring Sci* 2014; 3: 257–263.
5. de Mendonça Lima CA and Ivbijaro G. Mental health and wellbeing of older people: opportunities and challenges. *Ment Health Fam Med* 2013; 10: 125–127.
6. ArslantaŞ H, Adana F, AbacigİL ErgİN F, et al. Loneliness in elderly people, associated factors and its correlation with quality of life: a field study from Western Turkey. *Iran J Public Health* 2015; 44: 43–50.

7. Manini TM and Pahor M. Physical activity and maintaining physical function in older adults. *Br J Sports Med* 2009; 43: 28–31.
8. Hongthong D, Somrongthong R and Ward P. Factors influencing the quality of life (QOL) among Thai older people in a rural area of Thailand. *Iran J Public Health* 2015; 44: 479–485.
9. Hosseinpoor AR, Bergen N, Kostanjsek N, et al. Socio-demographic patterns of disability among older adult populations of low-income and middle-income countries: results from world health survey. *Int J Public Health* 2016; 61: 337–345.
10. Koyanagi A, Stubbs B, Smith L, et al. Correlates of physical activity among community-dwelling adults aged 50 or over in six low- and middle-income countries. *PLoS One* 2017; 12: e0186992.
11. Vancampfort D, Lara E, Smith L, et al. Physical activity and loneliness among adults aged 50 years or older in six low- and middle-income countries. *Int J Geriatr Psychiatry* 2019; 34: 1855–1864.
12. Weber D and Scherbov S. Prospects of activity limitations among older adults in 23 low and middle income countries. *Sci Rep* 2020; 10: 10442.
13. Age H. Ageing population in Indonesia, http://ageingasia.org/ageing-population-indonesia/ (2018, accessed 10 March 2021).
14. Skoufalos A, Clarke JL, Ellis DR, et al. Rural aging in America: proceedings of the 2017 connectivity summit. *Popul Health Manag* 2017; 20: S1–S10.
15. Abikusno N. Sociocultural aspects of the aged: a case study in Indonesia. *Asia Pac J Clin Nutr* 2002; 11: S348–S350.
16. Cao J and Rammohan A. Social capital and healthy ageing in Indonesia. *BMC Public Health* 2016; 16: 631.
17. SchrÖDer-Butterfill E. Inter-generational family support provided by older people in Indonesia. *Ageing Soc* 2004; 24: 497–530.
18. Ng N, Hakimi M, Byass P, et al. Health and quality of life among older rural people in Purworejo district, Indonesia. *Global Health Action* 2010; 3: 2125.
19. Espinosa R, Arce A, Esquivel JA, et al. Risk factors associated to the quality of life of patients with osteoarthritis in Mexico. The impactar registry. *Osteoarthr Cartil* 2017; 25: S205.
20. Statistics Indonesia. Central Java elderly profile 2019, https://jateng.bps.go.id/publication/2020/08/26/a511c7a0fc096142a4b7441e/profil-lansia-provinsi-jawa-tengah.2019.html (2020, accessed 10 March 2021).
21. Rural and urban classification in Indonesia [Internet], https://sirusa.bps.go.id/webadmin/doc/MFD_2010_Buku_1.pdf (accessed 14 August 2010).
22. Sindunesia. Central Java map, https://sindunesia.com/wp-content/uploads/2020/08/Peta-Jawa-Tengah-Hitam-Putih.jpg (accessed 25 November 2020).
23. Chen KM, Lin MH, Wang YC, et al. A model-based survey of physical health in community-dwelling older adults. *J Nurs Res* 2012; 20: 239–248.
24. Jacob L, Breuer J and Kostev K. Prevalence of chronic diseases among older patients in German general practices. *Ger Med Sci* 2016; 14: Doc03.
25. Thakur RP, Banerjee A and Nikumb VB. Health problems among the elderly: a cross-sectional study. *Ann Med Health Sci Res* 2013; 3: 19–25.
26. Sinnige J, Braspenning J, Schellevis F, et al. The prevalence of disease clusters in older adults with multiple chronic diseases – a systematic literature review. *PLoS One* 2013; 8: e79641.
27. Somrongthong R, Hongthong D, Wongchalee S, et al. The influence of chronic illness and lifestyle behaviors on quality of life among older Thais. *BioMed Res Int* 2016; 2016: 2525941.
28. Gallant MP, Spitze G and Grove JG. Chronic illness self-care and the family lives of older adults: a synthetic review across four ethnic groups. *J Cross Cult Gerontol* 2010; 25: 21–43.
29. Han K-T, Park E-C, Kim J-H, et al. Is marital status associated with quality of life? *Health Qual Life Outcomes* 2014; 12: 109.
30. Gutiérrez-Vega M, Esparza-Del Villar OA, Carrillo-Saucedo IC, et al. The possible protective effect of marital status in quality of life among elders in a U.S.-Mexico border city. *Community Ment Health J* 2018; 54: 480–484.
31. Gaymu J and Springer S. How does living alone or with a partner influence life satisfaction among older men and women in Europe? *Population* 2012; 67: 43–69.
32. Robert SA, Cherepanov D, Palta M, et al. Socioeconomic status and age variations in health-related quality of life: results from the national health measurement study. *J Gerontol B Psychol Sci Soc Sci* 2009; 64: 378–389.
33. Jung SE, Bishop AJ, Kim M, et al. Nutritional status of rural older adults is linked to physical and emotional health. *J Acad Nutr Diet* 2017; 117: 851–858.
34. Jung SE, Kim S, Bishop A, et al. Poor nutritional status among low-income older adults: examining the interconnection between self-care capacity, food insecurity, and depression. *J Acad Nutr Diet* 2019; 119: 1687–1694.
35. Bielderman A, de Greef MH, Krijnen WP, et al. Relationship between socioeconomic status and quality of life in older adults: a path analysis. *Qual Life Res* 2015; 24: 1697–1705.
36. Chan YY, Teh CH, Lim KK, et al. Lifestyle, chronic diseases and self-rated health among Malaysian adults: results from the 2011 national health and morbidity survey (NHMS). *BMC Public Health* 2015; 15: 754.
37. Phillips SM, Wójcicki TR and McAuley E. Physical activity and quality of life in older adults: an 18-month panel analysis. *Qual Life Res* 2013; 22: 1647–1654.

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