The Association Between Physical Activity and Self-Rated Health Among Older Adults

I Putu Agus Dharma Hita[1], B.M. Wara Kushartanti[1], Elsa Ariestika[1], Widiyanto[1], and Emmanuel Nizeyumukiza[2]

[1] Yogyakarta State University, Indonesia
[2] Université des Grands Lacs, Burundi
* Emmanuel Nizeyumukiza, corresponding author. Email: emmanizeye90@gmail.com
Submitted: 16 December 2020, Accepted: 20 March 2021, Published: 31 May 2021
Volume 29, 2021. p.450-458. http://doi.org/10.25133/JPSSv292021.028

Abstract

Although there is substantial evidence on the association between physical activity and self-rated health among older adults globally, there is a paucity of findings on this topic for the aging Indonesian population. The present study was conducted to investigate the association between self-reported physical activity and self-rated health among older adults in Indonesia. The data used were from the fifth wave of the Indonesian Family Life Survey (IFLS). A multilevel regression approach was used for analysis. A sample of 1,813 older adults (aged 60 and over) within 311 communities was used in the study. Self-reported physical activity measured by time spent walking was the independent variable, and self-rated health was the dependent variable. The analysis was adjusted for gender, age, education level, marital status, religiosity, retirement status, neighborhood safety, extroversion, and subjective poverty. The results revealed that increased physical activity was consistently associated with better self-rated health in both unadjusted (β=0.04, p<0.05) and adjusted (β=0.06, p<0.01) models. To improve public health in Indonesia, primary health care professionals, health policymakers, and other health promoters should consider including physical activity in health policies and encourage older individuals to engage in regular physical activity.

Keywords

Indonesia; physical activity; self-perceived health; seniors

Introduction

Health care systems are concerned with disease prevention in old age. This aged stage of life is usually accompanied by a relatively high prevalence of health issues (Barnett et al., 2012). This concern continues to rise, given that the senior population continues to increase due to the increased life expectancy. It is estimated that elderly individuals aged over 60 will almost double by 2050, from 12% in 2015 to 22% in 2050 (World Health Organization, 2017). Meanwhile, in the ASEAN region, it is predicted that older adults will represent 24.2% of the entire population in 2050 (Adioetomo & Mujahid, 2014). This is interesting because the aging process may lead to deterioration in both mental and physical health.

Self-rated health has been found to be among the predictive factors of morbidity and mortality and is a valid measure of individuals' health (DeSalvo et al., 2006). Moreover, it is a variable that covers different dimensions of human health (Idler & Benyamini, 1997), including mental and physical health. These dimensions are not only physiological but also psychological, social, and functional (Damian et al., 1999). Many researchers and health professionals have used clinical variables to monitor older adults' health in the senior population. Yet, evidence has shown that self-perceived health is an important variable for predicting health status over time (Idler & Benyamini, 1997).

Among the strategies adopted to prevent and reduce chronic diseases observed in later life, physical activity promotion has gained substantial attention in the literature (Woodcock et al., 2011). Physical activity is recommended to be implemented in health systems. Performing physical activity was found to be effective in reducing the risk of developing chronic conditions. In an eight years follow-up study among women aged 40 to 64 years, it was found that even moderate intensity and duration of physical activity like walking was associated with a reduced risk of type two diabetes mellitus (Hu et al., 1999). A negative relationship was found in a study investigating the links between physical activity and multimorbidity among younger and older adults (Cimarras-Otal et al., 2014). In Indonesia, physically active individuals were less likely to contract diabetes mellitus Type 2 (Simbolon et al., 2020).

Accordingly, many researchers have found a linear association between physical activity and self-rated health, claiming that physically active individuals report better health. Abu-Omar et al. (2004) investigated this relationship across 15 European countries. They found that individuals who were engaged in physical activity were more likely to report better health. However, there was a significant difference in the strength of the association across the countries. Likewise, in a sample of Spaniards aged between 15 and 64, Galán et al. (2010) examined a dose-response relationship between leisure-time physical activity and self-rated health. They revealed a significant relationship between the amount of leisure-time physical activity and self-rated health. Subsequently, the strength of the association increased with the frequency of the activity. In a longitudinal study conducted among older adults from Germany, physical activity was positively related to positive perceptions of aging, which led to better health (Beyer et al., 2015). The study found that physical activity mediated the relationship between self-perception of aging and self-rated health. Walking was also found predictive of self-rated health. With a sample of Spaniard adults, one study found that regular walking was associated with self-rated health (Romo-Perez et al., 2016).

Walking is one of the most recommended activities for older people, and it has been extensively examined and showed a positive association with self-rated health. Neufeld et al.

(2013) found that walking ability was related to self-rated health among older adults. They concluded that difficulty in walking might be predictive of health problems in an aging population.

Indonesia is one of the fastest aging populations worldwide, with an estimated 74 million older adults by 2050 (Kadar et al., 2013). Although there is substantial evidence on the association between physical activity and self-rated health among older adults worldwide, this evidence is lacking for the Indonesian population. A recent review suggested that correlates of physical activity may differ from one country to another, and that country-specific research is needed to inform better national and local public health interventions (Liangruenrom et al., 2019). Therefore, this study aimed to investigate the association between self-reported physical activity and self-rated health among older adults in Indonesia.

Methods

Data

The data were taken from the fifth wave of the Indonesian Family and Life Survey (IFLS) conducted in late 2014 and early 2015. This is a continuous sociodemographic and health survey conducted since 1993 in collaboration with Rand Corporation (California, United States) and the survey METER (Yogyakarta, Indonesia). Data collection was performed at the individual, household, and community levels using multistage stratified sampling (Strauss et al., 2016). When the survey started in 1993, the households were randomly selected from 321 enumeration areas in 13 provinces of Indonesia. In each urban enumeration area, twenty households were randomly selected, and in each rural enumeration area, thirty households were randomly selected. The fifth wave of IFLS collected information on 16,204 households and 50,148 individuals aged 15 and older from 311 communities. These 311 communities correspond to the 321 enumeration areas, excluding nine twin EAs (Strauss et al., 2016). A sample of older individuals (≥60 years of age) was used in the present study. This cutoff of 60 was used following the World Health Organization (2017) investigation, which used this lower threshold for older adults. Before enrolling in the survey, the respondents provided informed consent. A sample of 1,813 respondents with completed data was used in the data analysis.

Measures

Self-rated health was the outcome variable in this study. The survey asked the respondents to rate their health in general, with the following response options: 'very healthy,' 'somewhat healthy,' 'somewhat unhealthy,' and 'very unhealthy' (Strauss et al., 2016). The responses were recorded on an ordinal scale as follows: '1' for very unhealthy, '2' for somewhat unhealthy, '3' for somewhat healthy, and '4' for very healthy.

Physical activity was the independent variable in this study. The survey asked the respondents to estimate the time they spent walking in the last seven days. This included the time spent at work, at home, walking to travel from one place to another, and walking for recreation, exercise, sport, or leisure. They were asked whether they engaged in any of these activities mentioned above during the past seven days for at least ten consecutive minutes

(Strauss et al., 2016). The survey also included the following question: "How much time did you usually spend doing any of these activities on one of those days?", with these response options: < 2 hours (< 30 minutes or ≥ 30 minutes) and ≥ 2 hours (< 4 hours or ≥ 4 hours) (Strauss et al., 2016). These responses were recorded for analysis as follows: ' 1' for < 30 minutes, '2' for ≥ 30 minutes, '3' for < 4 hours, and '4' for ≥ 4 hours.

The survey also collected data on gender, age, education level, marital status, religiosity, retirement status, neighborhood safety, extroversion, and subjective poverty of respondents. For statistical analysis, gender was given a dummy code '1' for males and '0' for females (reference group). Age was broken down into three categories: 60-69 coded as '1' (reference group), 70-79 coded as '2', and 80-90 coded as '3'. For the education level, '1' represented primary education (reference group), '2' junior high school, '3' senior high school, and '4' higher education. Two categories were used for marital status: '1' for married individuals and '0' for unmarried (single, widowed, and divorced) (reference group). A dummy code '1' was assigned to those who reported that they were religious and '0' to non-religious (reference group). For retirement status, '1' was assigned to retired individuals and "0" to those still in the labor force (reference group). For neighborhood safety, the survey asked respondents whether it was safe for them to walk alone at night in most parts of their place of residence (Strauss et al., 2016). The answers were recorded as follows: '1' for very unsafe, '2' for unsafe, '3' for safe, and '4' for very safe. Extroversion was assessed using the Big Five Inventory (Rammstedt & John, 2007). For the subjective poverty level, the respondents were asked to assess their economic status on a scale from 1 (denoting 'richest people') to 6 (denoting 'poorest people') (Strauss et al., 2016).

Statistical analysis

The data were managed and analyzed with R statistical software (Ihaka & Gentleman, 1996). The dplyr (Mailund, 2019) and lmertest (Kuznetsova et al., 2017) packages were employed for data analysis. A multilevel regression analysis was performed with data from 1,813 older adults within 311 communities. This multilevel approach was used in order not to underestimate the standard errors of the regression coefficients, which usually occurs in typical multivariate analysis (Hibino et al., 2012). Three models were analyzed: Model 1 (empty model) was a null model with individuals within communities. Model 2 included physical activity as an explanatory variable. Model 3 included gender, age, education level, marital status, religiosity, retirement status, neighborhood safety, extroversion, and subjective poverty as covariates.

Results

The descriptive statistics for the study sample and the mean scores for self-rated health across sociodemographic categories are presented in Table 1. The mean age was 67.01 years (SD = 6.01), the mean score of self-rated health was 2.75 (SD = 0.70), the mean score for physical activity was 2.04 (SD = 0.89), the average score for extroversion was 7.02 (SD = 1.33), the mean score for subjective poverty was 4.06 (SD = 1.11), and the average score for neighborhood safety was 3.17 (SD = 0.48).

Table 1: Characteristics of the Study Sample and Mean Scores for Self-Rated Health Across Sociodemographic Categories (n = 1,813)

Study variables	*n*	%	Mean (SD)	Mean of SRH (SD)
Self-Rated Health	1,813		2.75 (0.70)	
Physical activity	1,813		2.04 (0.89)	
Age in Years	1,804			67.02 (6.01)
60-69	1,255	69.56		2.76 (0.69)
70-79	483	26.77		2.70 (0.71)
80-90	66	3.65		2.80 (0.74)
Gender				
Female	905	49.9		2.73 (0.72)
Male	908	50.1		2.76 (0.68)
Marital Status				
Married	1,224	67.5		2.77 (0.68)
Unmarried	589	32.5		2.70 (0.74)
Education				
Primary	999	72.7		2.73 (0.70)
Junior high school	179	13.02		2.68 (0.65)
Senior high school	150	10.9		2.77 (0.60)
Higher education	46	3.34		2.80 (0.45)
Retired				
Yes	453	27.5		2.64 (0.71)
No	1,197	72.5		2.80 (0.68)
Religious				
Yes	1,255	90.2		2.73 (0.70)
No	136	9.8		2.69 (0.69)
Extroversion	1,813		7.02 (1.33)	
Subjective poverty	1,788		4.06 (1.11)	
Neighborhood Safety	1,813		3.17 (0.48)	

Note: SD = Standard Deviation, SRH = Self-Rated Health

Slightly over 50% of the respondents were males, and around 67% were married. Seventy-two percent had completed primary education, 13% junior high school, 11% senior high school, and 3% higher education. Slightly over 27% were retired, and over 90% were religious. The results of the multilevel regression analysis with self-rated health as the dependent variable are presented in Table 2.

Table 2: Results of Multilevel Regression Analysis with Self-Rated Health as the Dependent Variable (n = 1,813)

Independent variables	**Model 1**		**Model 2**		**Model 3**	
	Coef.	**SE**	**Coef.**	**SE**	**Coef.**	**SE**
Intercept	2.74***	0.02	2.66***	0.04	2.60***	0.25
Physical activity			0.04*	0.01	0.06**	0.02
Gender (ref = female)						
Male					0.03	0.05
Age (ref =60-69)						
70-79					0.03	0.05
80-90					0.01	0.18
Marital status (ref = unmarried))						

Independent variables	Model 1		Model 2		Model 3	
	Coef.	SE	Coef.	SE	Coef.	SE
Married					-0.05	0.05
Education (ref = primary)						
Junior high school					0.02	0.07
Senior high school					0.02	0.07
High education					0.04	0.11
Retirement (ref = not retired)						
Retired					-0.15**	0.05
Religiosity (ref = non-religious)						
Religious					0.07	0.07
Extroversion					-0.01	0.01
Neighborhood safety					0.10*	0.05
Subjective poverty					-0.06**	0.02
Random parameters						
Between Communities	0.03(0.17)		0.03 (0.18)		0.04 (0.21)	
R-Squared	0.06		0.07		0.13	

*Note: * p<5%, ** p<1%, *** p<0.1% SE = Standard Error, SRH = Self-rated Health, Coef = Coefficients, Ref = reference group*

Model 1 (null model) indicated a significant variation of self-rated health among communities (σ2u0=0.03), and the intraclass correlation was 0.06. Physical activity was positively associated with self-rated health (β=0.04, p<0.05), taking into account cluster-specific random effects. Even after controlling covariates, physical activity was still associated with better self-rated health (β=0.06, p<0.01). Among the covariates, retirement status, subjective poverty, and neighborhood safety were significantly related to self-rated health with (β= -0.15, p<0.01, β= -0.06, p<0.01, and β=0.10, p<0.05 respectively).

Discussion

Despite the number of studies that investigated the association between physical activity and self-rated health, few have been conducted among the aging Indonesian population. The aim of this study was to address this gap. The main findings revealed that the time spent walking was associated with better self-rated health among older adults in Indonesia, even after adjusting for a range of potential confounding variables. These findings suggest that the aging individuals in Indonesia can derive health benefits from increasing participation in their physical activity.

These findings corroborate prior studies that have documented the benefits of engaging in physical activity for self-rated health in old age. For example, Kerr et al. (2012) investigated the links between physical activity and self-rated health among older adults aged 66 years and over in 2 major US metropolitan regions. The results showed that physical activity was predictive of self-rated health. Similarly, in a study involving community-dwelling older adults in Iceland, it was found that physical activity increased the likelihood of reporting good self-rated health (Arnadottir et al., 2011). A similar trend was found among aging people survivors of cancer. Those engaged in physical activity reported higher self-perceptions of health (Lee et al., 2015).

Even though physical activity is significantly associated with better self-rated health among the elderly, it is worthy of acknowledging that some previous studies did not confirm a significant role of physical activity in predicting self-rated health. For example, in a study conducted by Parkatti et al. (1998) with a sample of Dutch older adults aged between 55 and 89 years, it was found that physical activity predicted better self-rated health, but only before adjusting confounding variables. The possible explanation they provided was that the important factor in predicting self-rated health was the cognitive interpretation associated with physical functioning and not the physical activity per se.

Self-rated health is a concept that encompasses physiological, psychological, and social health components (Damian et al., 1999). Therefore, the paths through which physical activity is associated with self-rated health might be physiological, psychological, and social. For example, physical activity may help reduce body fat and increase insulin sensitivity, resulting in the reduction of blood sugar, which in turn reduces the risk of diabetes mellitus type 2 (Parkatti et al., 1998). Apart from improved health, physical activity may increase the secretion of endorphins, resulting in improved mood (Basso & Suzuki, 2017). Moreover, physical activity may improve social relationships, as people involved in physical activities engage in more interactions with peers, which may result in increased social support (Kaplan et al., 1991).

Old age is often characterized by a sedentary lifestyle. Previous research found that with more than 70% of older adults in Indonesia, one of the most prevalent activities was watching television (Arifin et al., 2012). The same study reported that the number of older adults participating in outdoor activities and physical activities was very low (less than 2%). This is alarming for the national health care in a country with an increasing number of older adults. Thus, encouraging ageing individuals to participate in physical activity should be a priority for health professionals and policymakers.

Some limitations have to be acknowledged. Because of its cross-sectional design, no causal relationships could be established in this study. Longitudinal studies might provide a better insight into the direction and causality of this relationship. Another limitation is that the study used self-reported walking as physical activity measure. The key strength of the study is the use of a relatively large, population-representative sample that allowed to make inferences at the national level.

Conclusion

This study found evidence that engaging in more physical activity as measured by time spent walking is linked to better self-rated health among older adults in Indonesia, even after adjusting for gender, age, education level, marital status, religiosity, retirement status, neighborhood safety, extroversion, and subjective poverty. To improve public health in Indonesia, primary health care professionals, health policymakers, and other health promoters should consider encouraging older individuals to engage in regular physical activity.

Acknowledgments

The data used in this study came from the fifth wave of the Indonesia Family and Life Survey collected by RAND Corporation (http://www.rand.org/labour/FLS/IFLS.html). The authors are grateful to this institution that provided free access to the database and the Indonesian people who completed the survey.

References

Abu-Omar, K., Rütten, A., & Robine, J. M. (2004). Self-rated health and physical activity in the European Union. *Sozial- und Präventivmedizin/Social and Preventive Medicine*, *49*(4), 235–242. https://doi.org/10.1007/s00038-004-3107-x

Adioetomo, S. M., & Mujahid, G. (2014). *Indonesia on the threshold of population ageing*. UNFPA Indonesia. https://indonesia.unfpa.org/sites/default/files/pub-pdf/BUKU_Monograph_No1_Ageing_03_Low-res.pdf

Arifin, E. N., Braun, K. L., & Hogervorst, E. (2012). Three pillars of active ageing in Indonesia. *Asian Population Studies*, *8*(2), 207-230. https://doi.org/10.1080/17441730.2012.680334

Arnadottir, S. A., Gunnarsdottir, E. D., Stenlund, H., & Lundin-Olsson, L. (2011). Determinants of self-rated health in old age: A population-based, cross-sectional study using the International Classification of Functioning. *BMC Public Health*, *11*, 1–38. https://doi.org/10.1186/1471-2458-11-670

Barnett, K., Mercer, S. W., Norbury, M., Watt, G., Wyke, S., & Guthrie, B. (2012). Epidemiology of multimorbidity and implications for health care, research, and medical education: A cross-sectional study. *The Lancet*, *380*(9836), 37–43. https://doi.org/10.1016/S0140-6736(12)60240-2

Basso, J. C., & Suzuki, W. A. (2017). The Effects of acute exercise on mood, cognition, neurophysiology, and neurochemical pathways : A review. *Brain Plasticity*, *2*(2), 127–152. https://doi.org/10.3233/BPL-160040

Beyer, A. K., Wolff, J. K., Warner, L. M., Schüz, B., & Wurm, S. (2015). The role of physical activity in the relationship between self-perceptions of ageing and self-rated health in older adults. *Psychology and Health*, *30*(6), 671–685. https://doi.org/10.1080/08870446.2015.1014370

Cimarras-Otal, C., Calderón-Larrañaga, A., Poblador-Plou, B., González-Rubio, F., Gimeno-Feliu, L. A., Arjol-Serrano, J. L., & Prados-Torres, A. (2014). Association between physical activity, multimorbidity, self-rated health and functional limitation in the Spanish population. *BMC Public Health*, *14*(1), 1–10. https://doi.org/10.1186/1471-2458-14-1170

Damian, J., Ruigomez, A., Pastor, V., & Martin-Moreno, J. M. (1999). Determinants of self assessed health among Spanish older people living at home. *Journal of Epidemiology and Community Health*, *53*(7), 412–416. https://doi.org/10.1136/jech.53.7.412

DeSalvo, K. B., Bloser, N., Reynolds, K., He, J., & Muntner, P. (2006). Mortality prediction with a single general self-rated health question: A meta-analysis. *Journal of General Internal Medicine*, *21*(3), 267–275. https://doi.org/10.1111/j.1525-1497.2005.00291.x

Galán, I., Meseguer, C. M., Herruzo, R., & Rodríguez-Artalejo, F. (2010). Self-rated health according to amount, intensity and duration of leisure time physical activity. *Preventive Medicine*, *51*(5), 378–383. https://doi.org/10.1016/j.ypmed.2010.09.001

Hibino, Y., Takaki, J., Ogino, K., Kambayashi, Y., Hitomi, Y., Shibata, A., & Nakamura, H. (2012). The relationship between social capital and self-rated health in a Japanese population : a multilevel analysis. *Environmental Health and Preventive Medicine*, *17*, 44–52. https://doi.org/10.1007/s12199-011-0218-x

Hu, F. B., Sigal, R. J., Rich-Edwards, J. W., Colditz, G. A., Solomon, C. G., Willett, W. C., Speizer, F. E., & Manson, J. E. (1999). Walking compared with vigorous physical activity and risk of Type 2 Diabetes in women: A prospective study. *JAMA*, *282*(15), 1433–1439. https://doi.org/10.1001/jama.282.15.1433

Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior*, *38*(1), 21–37. https://doi.org/10.2307/2955359

Ihaka, R., & Gentleman, R. (1996). R: A language for data analysis and graphics. *Journal of Computational and Graphical Statistics*, *5*(3), 299–314. https://doi.org/10.1080/10618600.1996.10474713

Kadar, K. S., Francis, K., & Sellick, K. (2013). Ageing in Indonesia - Health status and challenges for the future. *Ageing International*, *38*(4), 261–270. https://doi.org/10.1007/s12126-012-9159-y

Kaplan, G., Lazarus, N., Cohen, R., & Leu, D. (1991). Psychosocial factors in the natural history of physical activity. *American Journal of Preventive Medicine*, *7*(1), 12–17. https://doi.org/10.1016/S0749-3797(18)30959-0

Kerr, J., Sallis, J. F., Saelens, B. E., Cain, K. L., Conway, T. L., Frank, L. D., & King, A. C. (2012). Outdoor physical activity and self rated health in older adults living in two regions of the U.S. *International Journal of Behavioral Nutrition and Physical Activity*, *9*(1), 89. https://doi.org/10.1186/1479-5868-9-89

Kuznetsova, A., Brockhoff, P. B., & Christensen, R. H. B. (2017). lmerTest Package: Tests in Linear Mixed Effects Models. *Journal of Statistical Software*, *82*(13), 1-26. https://doi.org/10.18637/jss.v082.i13

Lee, H. Y., Kim, J., & Merighi, J. R. (2015). Physical activity and self-rated health status among older adult cancer survivors: Does intensity of activity play a role? *Oncology Nursing Forum*, *42*(6), 614–624. https://doi.org/10.1188/15.ONF.614-624

Liangruenrom, N., Craike, M., Biddle, S. J. H., Suttikasem, K., & Pedisic, Z. (2019). Correlates of physical activity and sedentary behaviour in the Thai population: A systematic review. *BMC Public Health*, *19*(1), 1–26. https://doi.org/10.1186/s12889-019-6708-2

Mailund, T. (2019). Manipulating Data Frames: dplyr. In *R Data Science Quick Reference* (pp. 109–160). Apress. https://doi.org/10.1007/978-1-4842-4894-2_7

Neufeld, S., Machacova, K., Mossey, J., & Luborsky, M. (2013). Walking ability and its relationship to self-rated health in later life. *Clinical Gerontologist*, *36*(1), 17–32. https://doi.org/10.1080/07317115.2012.731477

Parkatti, T., Deeg, D. J. H., Bosscher, R. J., & Launer, L. L. J. (1998). Physical activity and self-rated health among 55- to 89-year-old Dutch people. *Journal of Aging and Health*, *10*(3), 311–326. https://doi.org/10.1177/089826439801000303

Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less : A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, *41*(1), 203–212. https://doi.org/10.1016/j.jrp.2006.02.001

Romo-Perez, V., Souto, D., & Mota, J. (2016). Walking, body mass index, and self-rated health in a representative sample of Spanish adults. *Cadernos de Saúde Publica*, *32*(1), 1–10. http://dx.doi.org/10.1590/0102-311X00166414

Simbolon, D., Siregar, A., & Talib, R. A. B. D. (2020). Prevention and control of Type 2 Diabetes Mellitus in Indonesia through the modification of physiological factors and physical activities. *Kesmas: National Public Health Journal*, *15*(3), 120–127. http://dx.doi.org/10.21109/kesmas.v15i3.3354

Strauss, J., Witoelar, F., & Sikoki, B. (2016). *User's Guide for the Indonesia Family Life Survey, Wave 5* (Vol. 2). RAND Corporation. https://www.rand.org/pubs/working_papers/WR1143z2.html

Woodcock, J., Franco, O. H., Orsini, N., & Roberts, I. (2011). Non-vigorous physical activity and all-cause mortality: Systematic review and meta-analysis of cohort studies. *International Journal of Epidemiology*, *40*(1), 121–138. https://doi.org/10.1093/ije/dyq104

World Health Organization. (2017, December 12). *Mental health of older adults*. https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults