

## Original Research Article

# The impact of self-efficacy on physical activity in the elderly

Citra Puspa Juwita<sup>1,2\*</sup>, Rita Damayanti<sup>3</sup>

<sup>1</sup>Doctoral Student in Public Health, Faculty of Public Health, Universitas Indonesia, Depok, Indonesia

<sup>2</sup>Physiotherapy Program, Faculty of Vocational Studies, Universitas Kristen Indonesia, Jakarta, Indonesia

<sup>3</sup>Department of Health Education and Behavioral Sciences, Faculty of Public Health, Universitas Indonesia, Depok, Indonesia

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### \*Correspondence:

Citra Puspa Juwita,

E-mail: [citra.simatupang@uki.ac.id](mailto:citra.simatupang@uki.ac.id)

### ABSTRACT

**Background:** Sufficient physical activity is a lifestyle that must become a habit in the elderly so that it can reduce the incidence of non-communicable diseases. This study aims to determine the correlation self-efficacy with physical activity in the elderly.

**Methods:** The research study design was cross sectional on 106 elderly people aged >60 years in DKI Jakarta, Indonesia. Collecting data by interview using the global physical activity questioner (GPAQ) and the self-efficacy for exercise scale (SEE). Data were analyzed descriptively and analytically; the relationship was obtained if  $p < 0.05$ .

**Results:** Most of the respondents have high physical activity (58%), 29% have medium physical activity, and 13% have low physical activity. There is a correlation between self-efficacy and physical activity ( $r=0.60$ ,  $p=0.000$ ). In addition, there is also a correlation between comorbidities ( $r=0.33$ ,  $p=0.018$ ) and occupation ( $r=0.631$ ,  $p=0.000$ ) with physical activity.

**Conclusions:** Sufficient physical activity influenced by self-efficacy, occupation, and comorbidities as much as 40% and 60% explained by others.

**Keywords:** Self-efficacy, Physical activity, The elderly, Global physical activity questioner, Comorbid

### INTRODUCTION

Physical activity is a risk factor that causes the incidence of non-communicable diseases (NCDs). Physical activity is anybody activity that expends energy which includes heavy, moderate, and light physical activity. The benefits of a person's physical activity continue to increase in the health sector which can lead to a reduction in the burden of non-communicable diseases (NCDs), mental health and well-being.<sup>1</sup> Recent estimates for 2020 suggest that 3.9 million global deaths could be prevented each year due to adopting an active lifestyle.<sup>2</sup> Previous estimates in 2012 showed a greater potential, 5.3 million global deaths could be prevented each year by supporting people to be more active.<sup>1</sup> However, global data between 2001-2016 shows that one in four (27.5%) adults do not do as much physical activity as they should.<sup>3</sup> Basic health research data found that the Indonesian population aged over 10 years in 2013 was 26.1%, an increase of 7.4% in 2018 which was 33.5%. The elderly population (elderly) aged

60-64 with less physical activity in 2013 also increased by 4.5% in 2018 and those over 65 years old were even worse, increasing by 10.5%. In 2018 DKI Jakarta was the city that contributed the most to the less physical activity, namely 47.8%.<sup>4</sup> Indonesia has been facing the COVID-19 pandemic for 2 years. To break the chain of transmission, people are required to always follow health protocols, which force people to avoid crowds and physical distancing. Following health protocols can make people spend a lot of time sitting or sleeping, so the incidence of less physical activity will be higher in the community.

In line with the increase in less physical activity in 2018, there was also an increase in the prevalence of non-communicable diseases such as cancer, stroke, chronic kidney disease, diabetes mellitus, joints, and hypertension.<sup>4</sup> Non-communicable diseases are more common in the elderly, where as you get older, your body's function and strength will decrease. Currently in Indonesia there is an increase in the number of the elderly

due to the increasing health technology, the opening of access to health services, health financing insurance, and others which bring the life expectancy to 71.4 years in 2019.<sup>5</sup> Sufficient physical activity as one of the risk factors for the occurrence of non-communicable diseases is the best choice for behavior in society so that it becomes a habit in all age groups.

Physical activity is an intervention that can be done anywhere and anytime, but it is not easy to do because many elderlies have joint disease, so they are afraid to move their body or the elderly are lazy to move for fear of falling.<sup>4</sup> The elderly who do not do enough physical activity tend to be overweight, because the energy that goes in is greater than the energy that goes out. Physical activity that is not carried out routinely will be less beneficial for health, many people do physical activity because it is influenced by the environment, for example invited by family or friends, because they attend an event, and maybe because of occasional recreation. Good physical activity is done sufficiently according to ability, routine or continuous. Regular physical activity is needed to balance the incoming and outgoing energy.

Self-efficacy to carry out physical activity is very necessary so that it triggers people to get used to sufficient physical activity. Self-efficacy is a central concept in Albert Bandura's theory of social learning which describes the cognitive state of taking control of behavioral change.<sup>6</sup> People who have self-efficacy then behavior change will be possible to achieve, because their behavior is not influenced by the environment, but their beliefs to act, and create the behavior itself, and are able to control the environment that hinders the achievement of behavior. When there are obstacles, there are situations or emotional/feeling conditions that influence them to achieve sufficient physical activity, then someone who has self-efficacy will still be able to achieve sufficient physical activity. What about the elderly who experience degenerative processes in their bodies, is self-efficacy related to their physical activity? Therefore, elderly. The purpose of this study was to determine the correlation between self-efficacy with physical activity in the

**METHODS**

The research was conducted in the capital city of Indonesia, namely DKI Jakarta which has 6 districts, in this case only 5 districts were represented. Research design cross sectional aims to determine the correlation between self-efficacy with physical activity in the elderly. Data was collected by interviewing enumerators who had been trained by the research team. The instrument used is the global physical activity questioner (GPAQ) which is proven to be valid and reliable in routine national surveys. Physical activity asked to respondents is physical activity for the last 7 days in minutes per week (MET), including heavy physical activity, moderate activity, walking or cycling habits of at least 10 minutes per day, heavy recreation, and moderate recreation. The weight

category will be multiplied by eight by the day of the week and the number of minutes in the day. The moderate category and walking habits will be multiplied by four by the day of the week and the number of minutes in a day. The end result of physical activity was high ( $\geq 3000$  MET), moderate ( $3000 > \text{MET} \geq 600$ ), and low ( $600 < \text{MET}$ ).

Self-efficacy uses the self-efficacy for exercise scale (SEE) questionnaire<sup>7</sup> which consists of 16 question items with a scale of 0 not confident to 10 very confident. The results of each respondent's answers will be categorized as self-efficacy if they get a score above 75%, self-efficacy if they get a score of 56%-75%, and self-efficacy if they get a score below 55% of the total answers.

**RESULTS**

Respondents of this study were 106 elderly people, with an average age of 70 years (SD 7 years). Gender is dominated by 60% women and the rest are men. Most of the occupation status did not work, namely 61% and respondents with the most comorbidities were those who had more than 1 disease, namely 42%. Most of the respondent have a high physical activity (58%) and moderate self-efficacy (47%).

**Table 1: Characteristics of respondents.**

Information	Total	Percentage (%)
<b>Gender</b>		
Male	42	40
Woman	64	60
<b>Occupation</b>		
Workers	41	39
Not workers	65	61
<b>Comorbid</b>		
None	22	21
One comorbid	39	37
More than one comorbid	45	42
<b>Physical activity</b>		
High	61	58
Medium	31	29
Low	14	13
<b>Self-efficacy</b>		
High	25	24
Moderate	50	47
Low	31	29
<b>Description</b>		
Age (years)	70	7

The normality test of the data was carried out using Kolmogorof-Smirnov and the data were not normally distributed where sig 0.000 was obtained. Correlation of factors with physical activity using the gamma test. Based on the results of the analysis, the  $p=0.000 < 0.05$ , it can be concluded that there is a significant correlation between self-efficacy and physical activity in the elderly with a value of  $r=0.6$  which means a positive direction and a

strong correlation level. A positive direction indicates the higher the self-efficacy, the higher the physical activity of the elderly. The correlation test between comorbid and occupation also had a significant relationship with a correlation of 0.3 for comorbidities, and a correlation of 0.6 for occupation, with a positive direction. Gender and physical activity do not have a correlation where the  $p=0.373$ .

**Table 2: Correlation self-efficacy, co-morbid, occupation, and gender to physical activity.**

Description	Correlation	Approx. sig.
Self-efficacy-physical activity	0.600	0.000
Comorbid-physical activity	0.334	0.018
Occupation-physical activity	0.631	0.000
Gender-physical activity	0.158	0.373

The R square coefficient using the Nagelkerke value is 0.400, which means that the variable physical activity can be explained by self-efficacy, comorbidity, and occupation by 40%, the remaining 60% is explained by other factors.

## DISCUSSIONS

Self-efficacy is based on the construction of social cognitive theory, which refers to a person's "individual" perception of one's ability to perform a behavior" and "group belief in his or her ability to organize and carry out the actions necessary to achieve goals" respectively.<sup>8</sup> There are three domains of self-efficacy, namely interpersonal/situational, inhibiting situations, and inner feelings. Individuals who have self-efficacy will be sure they can achieve their goals, in this case sufficient physical activity.<sup>9</sup> The results of the study show that there is a strong correlation between self-efficacy and physical activity in the elderly where self-efficacy will result in high physical activity and conversely self-efficacy will result in low physical activity. These results are consistent with a study conducted in the city of Isfahan among patients with chronic disease in adults and the elderly where half of the patients had self-efficacy and 87.2% had low physical activity.<sup>10</sup> Another study was conducted in a nursing home in China that the perception of seriousness of illness, perception of triggers for action, cues to action, and self-efficacy are related to levels of physical activity.<sup>11</sup>

The elderly who less physical activity can bring the elderly to the incidence of illness, anxiety, poor quality of life, and even suicidal ideation.<sup>12-14</sup> becomes a burden for the heart to pump harder which leads to increased blood pressure or hypertension.<sup>15,16</sup> Less of physical activity can also cause muscle metabolism to use very little glucose as a fuel source, while during exercise, glucose and fat will

used as the main fuel that causes diabetes mellitus, by using glucose as the main fuel, blood glucose levels will decrease.<sup>17-19</sup> In individuals who are less active there is also a disturbance in vascular function where the mechanism of endothelial function disorders is considered from decreased nitric oxide, increased oxidative stress, and increased vasoconstrictor, endothelial dysfunction can cause strokes.<sup>20,21</sup>

Elderly is an age where there is a decrease in the ability of body functions so that most of the elderly have diseases, especially degenerative diseases. From the results of this study, it is known that 79% of respondents have a congenital disease (comorbid), some have one disease and some have up to four comorbidities. It is not uncommon that this comorbidity makes the elderly feel pain every day so that the elderly often feel weak, are reluctant to do activities, and spend their time sitting or lying down all day. According to the results of the study, there was a significant relationship between comorbidities and physical activity with a fairly strong correlation of 33%. The results of this study are consistent with previous studies using secondary data analysis on adults aged 45 years with pain that each additional comorbidity was associated with lower physical activity scores, one comorbidity affected 24%, two comorbidities affected 35%, and three or more comorbidities affect 74% compared with those without comorbidities.<sup>22</sup> This result is not in line with the research in Northern Iran on 1,297 respondents over 60 years. Through the chi square results, it was found that there was no correlation between comorbid chronic diseases and low physical activity ( $p=0.19$ ).<sup>23</sup>

The results of the study stated that 39% of the respondents were still working and the rest were not working. The applicable retirement age in Indonesia is 58 years for office work, so that the elderly aged 60 years and over who used to work in offices are no longer working. The types of work that respondents still do are jobs as educators, consultants, entrepreneurs, directors, and professions. A strong correlation was found in this study that is equal to 63% explaining that occupation is related to physical activity in respondents. These results are in accordance with research in Bangladesh that the age of the elderly is the same as 60 years and above which this age has entered retirement.<sup>24</sup> Gender, namely male and female, in the results of this study there was no relationship with physical activity carried out by the elderly. Women who are used to doing household chores regularly which are categorized as moderate physical activity and men who are accustomed to working outside the home or menial work at home can be factors that make there is no correlation between gender and physical activity. This study is not in line with research conducted in Khasan, Iran that there is a relationship between gender and physical activity.<sup>25</sup> The results of this study can be taken into consideration in making policies to increase the retirement age so that the elderly become productive and do not become a burden for the productive age.

Self-efficacy is a person's self-confidence that can motivate himself to achieve what is expected. Providing education about the impact of physical activity needs to be given to the elderly, in order to increase self-efficacy.<sup>26</sup> In addition, the results of 30 studies conducted on increasing physical activity in the elderly related to the environment are providing public facilities so that they can carry out physical activity regularly.<sup>27</sup> Regular physical activity for the elderly can keep the elderly healthy and carry out their daily activities independently. Physical activity can be explained by self-efficacy, comorbidities, and occupation as much as 40% while 60% is explained by other factors. Other factors related to physical activity were education level, depression, smoking and drinking habits, marital status, and level of independence.<sup>25,28,29</sup>

### Limitations

This study has limitations, namely recalling physical activities carried out in the last seven days where the ability of the elderly to remember has begun to decline. Subsequent research can use a more accurate tool in calculating physical activity of the elderly so as to get the actual data.

### CONCLUSION

Based on the results of the research conducted, it was found that there is a strong relationship between self-efficacy and occupation with physical activity, as well as a fairly strong relationship between comorbidities and physical activity in the elderly. the retirement age can be increased so that the elderly become productive and can produce sufficient physical activity.

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### REFERENCES

1. Lee IM, Shiroma EJ, Lobelo F. Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *Lancet*. 2012;380(9838):219-29.
2. Strain T, Brage S, Sharp SJ. Use of the prevented fraction for the population to determine deaths averted by existing prevalence of physical activity: a descriptive study. *Lancet Glob Heal*. 2020;8(7):e920-30.
3. Guthold R, Stevens GA, Riley LM, Bull FC.

Worldwide trends in insufficient physical activity from 2001 to 2016: a pooled analysis of 358 population-based surveys with 1.9 million participants. *Lancet Glob Heal*. 2018;6(10):e1077-86.

4. Kemenkes RI. Laporan\_Nasional\_RKD2018\_FINAL.Pdf. 2019. Available at: [http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan\\_Nasional\\_RKD2018\\_FINAL.pdf](http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan_Nasional_RKD2018_FINAL.pdf). Accessed on 12 March 2022.
5. Ministry of Health RI. Basic Health Research (Riskesdas), 2018. Available at: <https://bmcpublichealth.biomedcent>. Accessed on 12 March 2022.
6. BPS. Older Population Statistics 2019. Agency Center for Statistics, 2019. Available at: <https://www.un.org/en/development/desa/population/publications>. Accessed on 12 March 2022.
7. Hakim AR, Wang ST, Widianoro FX, Hannan M, Wang CJ, Fetzer SJ. The Indonesian Version of the Exercise Self-Efficacy Scale: Cross-cultural Adaptation and Psychometric Testing. *Asian Nurs Res (Korean Soc Nurs Sci)*. 2020;14(5):300-5.
8. Bandura A. Guide for constructing self-efficacy scales. 2009;4:307-37.
9. Degerstedt Å, Alinaghizadeh H, Thorstensson CA, Olsson CB. High self-efficacy-A predictor of reduced pain and higher levels of physical activity among patients with osteoarthritis: An observational study. *BMC Musculoskelet Disord*. 2020;21(1):1-14.
10. Daniali S, Darani F, Eslami A, Mazaheri M. Relationship between Self-efficacy and Physical Activity, Medication Adherence in Chronic Disease Patients. *Adv Biomed Res*. 2017;6(1):63.
11. Huang J, Zou Y, Huang W. Factors associated with physical activity in elderly nursing home residents: a path analysis. *BMC Geriatr*. 2020;20(1):1-9.
12. Bhandari P, Paswan B. Lifestyle Behaviours and Mental Health Outcomes of Elderly: Modification of Socio-Economic and Physical Health Effects. *Ageing Int*. 2021;46(1):35-69.
13. Ibrahim AA, Al-Lami F, Al-Rudainy R, Khader YS. Mental Disorders Among Elderly People in Baghdad, Iraq, 2017. *Inq (United States)*. 2019;56.
14. Zhou L, Wang G, Jia C, Ma Z. Being left-behind, mental disorder, and elderly suicide in rural China: A case-control psychological autopsy study. *Psychol Med*. 2018;49(3):458-64.
15. Li W, Wang D, Wu C, Shi O, Zhou Y, Lu Z. The effect of body mass index and physical activity on hypertension among Chinese middle-aged and older population. *Sci Rep*. 2017;7(1):1-8.
16. You Y, Teng W, Wang J. Hypertension and physical activity in middle-aged and older adults in China. *Sci Rep*. 2018;8(1):1-9.
17. Oh HS. Opposite effects of work-related physical activity and leisure-time physical activity on the risk of diabetes in korean adults. *Int J Environ Res Public Health*. 2020;17(16):1-14.
18. Chang CH, Kuo CP, Huang CN, Hwang SL, Liao

- WC, Lee MC. Habitual physical activity and diabetes control in young and older adults with type II diabetes: A longitudinal correlational study. *Int J Environ Res Public Health*. 2021;18(3):1-12.
19. Castonguay A, Miquelon P. Motivational profiles for physical activity among adults with type 2 diabetes and their relationships with physical activity behavior. *Heal Psychol Behav Med*. 2017;5(1):110-28.
  20. Balla Abdalla TH, Rutkofsky IH, Syeda JN, Saghir Z, Muhammad AS. Occupational Physical Activity in Young Adults and Stroke: Was It Due to My Job? *Cureus*. 2018;10(8).
  21. Kanai M, Izawa KP, Kubo H. Association of perceived built environment attributes with objectively measured physical activity in community-dwelling ambulatory patients with stroke. *Int J Environ Res Public Health*. 2019;16(20):1-9.
  22. McKeivitt S, Healey E, Jinks C, Rathod-Mistry T, Quicke J. The association between comorbidity and physical activity levels in people with osteoarthritis: Secondary analysis from two randomised controlled trials. *Osteoarthr Cartil Open*. 2020;2(2):100057.
  23. Ahangar AA, Khoshmanzar H, Heidari B. Prevalence and the Determinants of Physical Activity in an Elderly Cohort of 60 years and more. A Cross-Sectional Case-Control Study. *Ageing Int*. 2019;44(4):399-410.
  24. Hanif AAM, Hasan M, Khan MSA. Prevalence and associated factors of insufficient physical activity among elderly people in Bangladesh: A nationally representative cross-sectional study. *BMJ Open Sport Exerc Med*. 2021;7(3):1-14.
  25. Sadrollahi A, Hosseinian M, Alavi NM, Khalili Z, Esalatmanesh S. Physical activity patterns in the elderly kashan population. *Iran Red Crescent Med J*. 2016;18(6).
  26. Winsor R. *Evaluation of Health Promotion and Disease Prevention Program (5<sup>th</sup> Edition)*. Oxford University. 2015.
  27. Gharaveis A. A systematic framework for understanding environmental design influences on physical activity in the elderly population: A review of literature. *Facilities*. 2020;38(9-10):625-49.
  28. Wang S, Ma W, Wang SM, Yi X. Regular physical activities and related factors among middle-aged and older adults in Jinan, China: A cross-sectional study. *Int J Environ Res Public Health*. 2021;18(19).
  29. Ethisan P, Somrongthong R, Ahmed J, Kumar R, Chapman RS. Factors related to physical activity among the elderly population in rural Thailand. *J Prim Care Community Heal*. 2017;8(2):71-6.

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