



Risks of Daily Living Activities on Related Disability

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ABSTRACT

Indonesian lost 6 days productive time in average because the disability of daily activities, that must be dealt with seriously because the effect of this problem is the declining quality of life of a person and will also cause a burden for country. This research is expected to be the key to understand and overcome the problems of disability in daily activities. The research used cross sectional design with a secondary data based of Indonesian Family Life Survey (IFLS) 5. The analysis in this study was logistic regression with samples aged >40 years who participated in data collection conducted by RAND with a total of 8185 respondents. Almost all variables examined in this study were statistically significant with disabilities, there were age ($p = 0.000$, OR = 2.996, 95%CI = 2.726 - 3.294), gender ($p = 0.000$, OR = 1.858, 95%CI = 1.693 - 2.039), marital status ($p = 0.000$, OR = 2.211, 95%CI = 1.997 - 2.448), employment status ($p = 0.000$, OR = 2.540, 95%CI = 2.321 - 2.780), arthritis status ($p = 0.000$, OR = 1.687, 95%CI = 1.482 - 1.919) and obesity ($p = 0.000$, OR = 1.345, 95%CI = 1.177 - 1.538). Only variable educational level that is not significant with disability ($p=0,198$). The target of disability management is prioritized at an older age by providing health education and assistance so that they can withstand the threat of daily disability and lead to an improvement in their quality of life.

INTRODUCTION

One of the consequences for people with disabilities is a decrease in the quality of life. It happens in developed and developing countries.¹ Disability is a big term used for situations such as having limited physical activity, impaired physical function, and limited social participation. More than billions of people are estimated to suffer various types of disabilities or around 15% of the world's population.² In developing countries, disability needs to be one of the concerns because it has the effect of poverty and the decline in the quality of life of a person which will also cause burden for country.³

Disability related to chronic disease conditions and age.² Several studies have linked limitation or disabilities related to activities of daily living with several diseases such as diabetes and heart failure, stroke, arthritis, and disorders such as cognitive and visual impairment.⁴ A study in United States was conducted and showed results of arthritis as the main cause of disability activities of daily living.⁴ It has been known, arthritis is a major cause of limitation for physical movement, because arthritis causes pain, stiffness and joint deformity, these all lead to limited mobility and cause person for not being able to carry out daily activities (daily living activities).⁵

More than one billion people or about 15% of the world's population are estimated to live with some form disabilities. Between one hundred and ten million (2.2%) to one hundred and ninety million (3.8%) people aged 15 years and over have difficulty in in terms of functioning. Arthritis is a non-communicable disease condition that becomes a major cause of disability in several countries.²

Based on the Republic of Indonesia's basic health research in 2018, the age of 40 years and over dominated the disability proportion of 73.7%, this needs to be a serious concern considering the effect of disability of daily activities is its impact on the Indonesian economic sector and lost an average of 6 days of productive time.^{6,7} This proves that as a developing country, Indonesia also feels the problem due to disability. Many factors cause disability or limitations, such as age, sex, marital status, education level, employment status, smoking habits and health conditions such as arthritis and obesity.⁸

IFLS 5 or The Indonesian Family Life Survey 5 which was initiated by RAND [RAND is a research organization engaged in the development of solutions and public policies], is a longitudinal study since 1993 at individual and household level.⁹ Longitudinal studies conducted by RAND Corporation are individual observation methods from time to time that have been conducted from 1993 to 2014 with a total of 5 surveys namely (IFLS 1, IFLS 2, IFLS 3, IFLS 4 and IFLS 5). The focus of data collection by IFLS is not only limited to health such as infectious and non-communicable diseases but also look at the economic side such as family income and others. This has made all the risk factors discussed in this study have been successfully identified through the IFLS 5 survey in 2014.^{8,10} This study aimed to find out what factors are associated with daily disability events.

MATERIAL AND METHOD

This study used secondary data collected by RAND as the Indonesian Family Life Survey (IFLS). IFLS is a collaboration of RAND and Survey Meter which conducted a longitudinal survey in Indonesia with Sampling frame research based on 1993 National Socioeconomic Survey/*Survei Sosial Ekonomi Nasional (SUSENAS)*. The survey did not only collect data on individuals, their families, members of their household, the environment where they live and the health as well as education facilities they used, but also data on the economic condition of family. IFLS has conducted 5 surveys from 1993 to 2014.¹⁰

The secondary data obtained was adjusted according to inclusion criteria such as respondents aged > 40 years old, free from diabetes, COPD, hypertension, stroke, heart disease, then data cleaning was carried out to exclude incomplete data so that samples that were further analyzed in this study were 8185 respondents. This study consisted of independent Variables such as age, sex, marital status, education level, employment status, smoking habit and health condition such as arthritis and obesity and the dependent variable was disability of daily activities. This research analysis used SPSS software application. Multivariate analysis in the form of logical regression with standard association values is Odds Ratio used to analyze data by considering variables that affect the dependent variable so that it will display the adjusted value.¹¹

The collection of data on human subjects in the IFLS study has passed an ethical test from RAND's Human Subjects Protection Committee (RAND's Institutional Review Boards) with protocol approval number s0064-06-01-CR01.¹²

RESULTS

Total of 8185 respondents above 40 years old were included in the criteria of this study, as explained in Table 1 that around 41.90% of respondents experienced limitations in carrying out daily activities. The average age of respondents in this study was 55.90 years old with the highest age category in the age group 40-59 years old. In the Table 1, it also found information that the respondents in this study were mostly female (62.20%) and more were those who were married (75.10%), low education (91.10%), employed (55.40%), did not smoke (73.10%). Based on the measurement of health status, respondents who did not experience arthritis were (86.90%) and not obese were (88%).

Table 1. Frequency Distribution of Research Variables

Variables	n = 8185	%
Disability Status		
Experiencing disability	3432	41.90
Not Experiencing disability	4753	58.10
Age (Mean = 55.90)		
Age (Year)		
≥ 60	2774	33.90
40 - 59	5411	66.10
Gender		
Female	5092	62.20
Male	3093	37.80
Marital Status		
Unmarried/divorced	2036	24.90
Married	6149	75.10
Educational Level		
Low education	7458	91.10
Higher education	727	8.90
Employment Status		
Unemployed	3654	44.60
Employed	4531	55.40
Smoking Habits		
Smoking	2199	26.90
Not smoking	5986	73.10
Arthritis Status		
Suffering from arthritis	1070	13.10
Not suffering from arthritis	7115	86.90
Obesity		
Obesity (IMT ≥ 30)	980	12
Not Obese (IMT < 30)	7205	88

Source: IFLS 5, 2014

Table 2 shows the results of the chi-square analysis on the correlation between age, gender, marital status, education level, employment status, smoking habits, health conditions such as arthritis, obesity and the disability events of daily living activities. From the statistical results it can be seen that there are several variables that have a significant correlation such as the age variable (p value = 0.000, OR 2.996; 95% CI 2.726 - 3.294), gender (p value = 0.000, OR 1.858; 95% CI 1.693 - 2.039), marital status (p value = 0.000, OR 2.211; 95% CI 1.997- 2.448), employment status (p value = 0.000, OR 2.540; 95% CI 2.321 - 2.780), arthritis (p value = 0.000, OR 1.687; 95% CI 1.482 - 1.919) and obesity (p value = 0.000, OR 1.345; 95% CI 1.177 - 1.538).

Table 3 shows the results of logistic regression multivariate analysis show that age is the most influential variable on the disability events of daily living activities based on data from the Indonesian Family Life Survey 5 with the OR for 2.499. The OR values obtained are adjusted.

DISCUSSION

The problem of disability of daily living activities must be one of concerns of the Indonesian government, Considering that the disability events of daily living activities in Indonesia have made the average Indonesian population lost 6-7 productive days and the disability prevalence in addition based on Basic Health Research data in Indonesia of 11%.¹³ From the results of multivariate logistic regression analysis, it was found that age, gender, marital status, education level, employment status, arthritis, and obesity were related to disability events of daily living activities.

The age variable influences the incidence of disabilities in daily activities. This is in line with Li's research which says that the incidence of disability is also related to age.¹⁴ This becomes possible because the increase in age is directly proportional to the decline in physical, sensory and cognitive functions, it makes them more difficult to be independent because of decrease in physical function in carrying out daily activities.¹ Apart from age, several other variables are significantly related to disability of daily living activities such as gender. In general, women have a longer life expectancy so that women become very familiar with health condition such as non-

communicable diseases. Things like this that make women have more risks to experience dis-

ability of activities daily living than men.^{15,16}

Table 2. The Correlation Among Age, Gender, Marital Status, Educational Level, Employment Status, Smoking Habits, Arthritis and Obesity

Variable	Disability Status				<i>p-value</i>	OR value (95%CI)
	Experiencing Disability		Not Experiencing Disability			
	n	%	n	%		
Age (Year)						
≥ 60	1651	59.50	1123	40.50	0.000	2.996
40 - 59	1781	32.90	3630	67.10		(2.726 - 3.294)
Gender						
Female	2419	47.50	2673	52.50	0.000	1.858
Male	1013	32.80	2080	67.20		(1.693 - 2.039)
Marital Status						
Unmarried/Divorced	1152	56.60	884	43.4	0.000	2.211
Married	2280	37.10	3869	62.90		(1.997 - 2.448)
Educational Level						
Low Education	3144	42.20	4314	57.80	0.198	1.111
Higher Education	288	39.60	439	60.40		(0.951 - 1.298)
Employment Status						
Unemployed	1986	54.40	1668	45.60	0.000	2.540
Employed	1446	31.90	3085	68.10		(2.321 - 2.780)
Smoking Habit						
Smoking	720	32.70	1479	67.30	0.000	0.588
Not smoking	2712	45.30	3274	54.70		(0.530 - 0.651)
Arthritis Status						
Suffering from Arthritis	569	53.20	501	46.8	0.000	1.687
Not Suffering Arthritis	2863	40.20	4252	59.8		(1.482 - 1.919)
Obesity						
Obesity (IMT ≥ 30)	474	48.40	506	51.60	0.000	1.345
Not Obese (IMT < 30)	2958	41.10	4247	58.90		(1.177 - 1.538)

Source: IFLS 5, 2014

Table 3. Gold Model Binary Logistic Regression Analysis on Age, Gender, Marital Status, Educational Level, Employment Status, Arthritis and Obesity to Disability of Daily Living Activities

Variable	AOR	95% CI	<i>p-value</i>
Age (Year)			
≥ 60	2.499	2.245 - 2.782	0.000
40 - 59	Reference		
Gender			
Female	1.505	1.352 - 1.677	0.000
Male	Reference		
Marital Status			
Unmarried/Divorced	1.294	1.152 - 1.455	0.000
Married	Reference		
Educational Level			
Low Education	1.180	1.001 - 1.391	0.049
Higher Education	Reference		
Employment Status			
Unemployed	1.734	1.568 - 1.918	0.000
Employed	Reference		
Arthritis Status			
Suffering from Arthritis	1.439	1.256 - 1.650	0.000
Not Suffering Arthritis	Reference		
Obesity			
Obesity (IMT ≥ 30)	1.289	1.118 - 1.487	0.000
Not Obese (IMT < 30)	Reference		

Source: IFLS 5, 2014

Marital status is significantly related to disability events of daily living activities. This is in line with Loukine's research which found that a person has a greater chance to experience disability in those who are divorced or not married.¹⁷ This event is possible because happy marriage can help someone through difficult times because of the effects of pain and also the presence of a partner who accompanies life can provide moral and social support in dealing with stress and chronic conditions.^{18,19}

Other variables related to daily living disability events are the level of education and employment status. Education and employment status are important for health. Those who are highly educated are more likely to meet their needs in improving their health because higher education is generally correlated with high personal income/economic income.²⁰

Variables that contribute to the association of events with daily living activities is arthritis. Arthritis is one of the main causes on the incidence of limitations in one's movements which causes a person to experience disability of daily living activities.²¹ Arthritis is a disease that attacks joints, soft tissue with extreme pain is progressive and causes a person to be unable to carry out daily activities as usual.²² The Indonesian Ministry of Health has found that arthritis is related to the incidence of disability in the age group > 15 years old.²³

Obesity was also related to disability events in daily living activities. Obesity was found to be related to the incidence of someone unable to carry out daily activities.²⁴ This relation was due to obesity that related to many diseases, one of them is joint disease or arthritis, where arthritis is one of the main causes of limited mobility on person.^{24,25}

This study certainly cannot be separated from limitations such as data retrieval on arthritis variables which allow for the usual information because arthritis variable is only diagnosed based on questions that are at risk of recall bias or provide invalid information due to respondents subjectivity which ultimately influences the outcome of association.^{26,27} The unavailability of data on diseases such as diabetes, stroke, hypertension, heart disease, in this study is one of the limitations because as we know that arthritis and obesity are the presence of these diseases. One of the weaknesses in this study is the

measurement of disability is categorized into a single unit, so it is not possible to see daily living activities per each day.

CONCLUSION AND RECOMMENDATION

Disability of daily living activities is generally caused by the limitations of one's movements that can occur due to chronic disease condition that is suffered by someone where the risk to experience chronic disease is greater because of the process of increasing age in each individual. It is time for the government and other health institutions to prevent this kind of disability. Prevention can be done by starting a health campaign to those who are at risk to start carrying out healthy living activities to be able to reduce the risk of non-communicable diseases which results in preventing disability for daily living activities.

AUTHOR CONTRIBUTIONS

ANP developed the theory and performed the computation; WZQ, PSN, AF verified the analytical methods; EES, RMD supervised the project. All authors discussed the results and contributed to the final manuscript. ANP = Ashar Nuzulul Putra; WZQ = Witri Zuama Qomariana; PSN = Purwo Setiyo Nugroho; AF = Adelina Fitri; EES = Erny Elviany Sabaruddin; RMD = Ridho Muhammad Dhani.

CONFLICTS OF INTEREST

The authors declare no conflict of interest or personal relationships that could have appeared the work reported in this paper.

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