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ORIGINAL ARTICLE

INDONESIAN HEALTH IN CRISIS: ASSOCIATION BETWEEN COGNITIVE FUNCTION AND DEPRESSION

Krisis Kesehatan di Indonesia: Hubungan antara Fungsi Kognitif dan Depresi berdasarkan Indonesian Family Life Survey

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ABSTRACT

Background: Depression differs from common mood swings and short-lived emotions. It has been extensively reported that cognitive impairment is associated with depression. Depression affects all aspects of life and interferes with productivity. **Purpose:** This study examined the association between cognitive function and depression in an Indonesian working age group. **Methods:** We used data from longitudinal socioeconomic and health surveys based on the fifth wave of the Indonesian Family Life Survey (IFLS) from October 2014 to April 2015. Household members aged 15-64 were included in the analysis. Depression was assessed using the Short Center for Epidemiological Research Depression Scale (CESD). Cognitive function was measured using the Cognitive Status Telephone Interview (TICS). Simple linear regression analysis was performed to examine the association between cognitive function and depression. **Results:** A total of 10,628 households were included. Most respondents had good cognitive function (61.84%) and no depression (82.19%). A simple linear regression analysis showed that household members with good cognitive functioning had a significantly lower risk of developing depression compared to household members with cognitive decline, he was significantly 1.28 lower. **Conclusion:** This study found a significant association between cognitive function and depression in the productive-age group. Further research exploring variables related to depression other than cognitive function is recommended. Health care providers should provide education, counselling,

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and training sessions related to healthy lifestyles and positive mindsets to prevent depression.

ABSTRAK

Latar Belakang: Depresi didefinisikan sebagai hilangnya kegembiraan karena pengalaman hidup yang traumatis dan penuh tekanan. Gangguan fungsi kognitif sering diteliti terkait hubungannya dengan depresi. Terjadinya depresi mempengaruhi setiap aspek kehidupan dan menghambat produktivitas. **Tujuan:** Penelitian ini mengkaji hubungan antara fungsi kognitif dan depresi pada kelompok usia produktif di Indonesia. **Metode**: Penelitian ini menggunakan data survei longitudinal sosial ekonomi dan kesehatan berdasarkan Indonesian Family Life Survey (IFLS) kelima dari Oktober 2014-April 2015. Anggota rumah tangga dengan usia 15-64 tahun dimasukkan dalam analisis. Depresi diperiksa menggunakan Short Center for Epidemiologic Studies Depression Scale (CESD), fungsi kognitif diukur menggunakan Telephone Interview for Cognitive Status (TICS). Analisis regresi linier sederhana dilakukan untuk menguji hubungan antara fungsi kognitif dan depresi. **Hasil**: 20257 anggota rumah tangga dilibatkan. Mayoritas responden memiliki fungsi kognitif yang baik (61.84%) dan tidak mengalami depresi (82,19%). Analisis regresi linier sederhana menunjukkan bahwa anggota rumah tangga dengan fungsi kognitif yang baik memiliki risiko depresi 1.28 lebih rendah secara signifikan dibandingkan dengan anggota rumah tangga dengan fungsi kognitif yang buruk. **Kesimpulan**: Penelitian ini menemukan hubungan yang signifikan antara fungsi kognitif dan depresi pada kelompok usia produktif. Penelitian lebih lanjut untuk mengeksplorasi variabel lain yang berhubungan dengan depresi selain fungsi kognitif direkomendasikan. Penyedia layanan kesehatan disarankan untuk memberikan pendidikan, konseling, dan sesi pelatihan terkait gaya hidup sehat dan pola pikir positif untuk mencegah depresi.

INTRODUCTION

Depression differs from common mood swings and short-lived emotional reactions to daily challenges. Depression can be a serious health condition, especially if it recurs and is moderate or severe (1). Depression is estimated to affect 4.40% of the global population. The prevalence of depression in Africa was 9%, 16% in the East Mediterranean, 12% in Europe, 15% in America, 27% in Southeast Asia, and 21% in the West Pacific. It attacks female more often than male (5.10% vs. 3.60%). Depression prevalence depends on age; it is elevated in adulthood, with 7.50% of 55-74 years old female suffered from depression (2). Health in the elderly not only refers to the condition of being free from disease, but also must pay attention to mental health. Elderly individuals usually have depression because of dependency (3). During a depressive episode, the person experiences a depressed mood (sadness, irritability, emptiness) or loss of pleasure or interest in activities for most of the day for at least 2 weeks. Others include poor concentration, excessive feelings of guilt or low self-esteem, feelings of hopelessness for the future, thoughts of death or suicide, sleep disturbances, changes in appetite or weight, and particularly fatigue or low energy. symptoms are seen (1). Women have higher rates of depression than men. Behavioral genetic studies have found gender differences in the genetic basis of depression (4).

Cognitive symptoms are among the core symptoms of depressive disorders (5). Neurocognitive impairment has been previously found to be experienced among youth with major depressive disorders. It affects real-world functional domains, including vocation and social participation, and impaired cognitive function and depression have been frequently studied among the elderly; however, it may also affect productive age (6). A previous study showed a significant

association between depression and cognitive function impairment (7).

Therefore, this study aimed to describe cognitive functioning and depression status and to examine the relationship between cognitive functioning and depression in working-age populations in Indonesia.

METHODS

Study Design and Sampling

This cross-sectional study used secondary data from a continuing longitudinal socioeconomic and health survey, the fifth wave of the Indonesian Family Life Survey (IFLS 5) (8). The survey collected data on Indonesian households, based on families, households, communities, health, and education, from October 2014 to April 2015. Stratified random sampling was applied in the survey, resulting in 13 out of 27 provinces being included in the analysis, which represents 83% of The Indonesian Population: North Sumatra, West Sumatra, South Sumatra, Lampung, Jakarta, West Java, Central Java, Yogyakarta, East Java, Bali, West Nusa Tenggara, South Borneo, and South Sulawesi (8). There were 50.000 individual data and 15.900 household data points responded to the survey. For our study, the population was households with a productive age of 15-64 years old and this research was conducted from December 2018 to August 2019.

Ethics clearance was obtained from Faculty of Public Health Research Ethics Commission Universitas Airlangga (No. 192/EA/KEPK/2019).

Data Collection

Individual characteristics (age, sex, occupation, and education), depression status, and cognitive function were obtained through interviews (8). Age was recorded in the questionnaire of Book 3 B cover (point COV3), sex was from book 3B cover (point COV5), occupation was from Book 3A section TK (point TK24A), and education was from Book 3A section DL (point DL06). Depressive status was measured using the Short Center for Epidemiological Studies Depression Scale (CESD) and recorded in Book 3 B, Section KP. Cognitive function was assessed using the Cognitive Status Telephone interview (9) and was obtained from Book 3 B section CO and section COB.

Data Analysis

Descriptive statistics of frequency distribution and percentage from age, sex, occupation, education, depression state, and cognitive function were used for the respondent characteristics. Cross-tabulation was used to determine the proportion of risk factors based on the depression state of the respondents. Age was divided into two categories: productive age (50-64 years old) and highly productive age (15-49 years old). Occupations included entrepreneurs, government employees, general employees, laborers, and unemployed individuals. Education level consisted of low, medium, and high (Act of the Republic of Indonesia number 20, year 2003 on National Education System). Depression status was determined by a CESD score of ten or more, and no depression state was defined as a CESD score of less than ten. Cognitive function (good/poor) was acquired from item number two (date question) and number six (substraction question) of the TICS questionnaire, with a maximum score of ten. Good cognitive function was indicated by a TICS score of six or more and poor cognitive function was indicated by a TICS score of less than six.

Bivariate and multivariate logistic regression analyses were performed to examine the association between depression and the risk factors in Indonesia. The risk factors included in the analysis were age, sex, education level, occupation, end of job, chronic medical history, and cognitive function. Odds ratios (OR), 95% confidence intervals (CI), and p-values were used to estimate the association between depression and risk factors in Indonesia. Data were analyzed using the STATA software. Statistical significance was set than 0.05. Missing data from all variables of interest were excluded from the analysis.

RESULTS

A total of 10,628 household members were included in the analysis. Respondent characteristic was displayed in Table 1. From a total of 10,628 respondents, most were of very productive age (89.59%), male (61.52%), had a secondary education level (38.86%), worked as private employees (67.48%), had no layoffs (71.76%), had no diabetes (98.33%), had no asthma (97.51%), had no heart disease (98.76%), had no stroke (98.76%), had no cancer (99.45%), had good cognitive function (61.84%), and were not depressed (82.19%).

Table 1
Frequency Distribution and Percentage Of Productive Age From Fifth Wave Of IFLS[a] Based On Depression Condition
[a] Indonesia Family Life Survey

Characteristics of Respondents	Frequency	Percentage
	n	%
Age		
Productive (50-64 years old)	1,106	10.41
Highly-productive (15-49 years old)	9,522	89.59
Sex		
Male	6,538	61.52
Female	4.090	38.48
Education level		
Low	3.967	37.33
Medium	4.130	38.86
High	2.531	23.81
Occupation		
Entrepreneur	1.230	11.57
Government employee	1.487	13.99
Private employee	7.172	67.48
Laborer	430	4.05
Unemployed	309	2.91
Work termination state		
Yes	3.001	28.24
No	7.627	71.76
Chronic disease history (no)		
Diabetes	10.450	98.33
Asthma	10.363	97.51
Heart disease	10.496	98.76
Stroke	10.603	99.76
Cancer	10.570	99.45
Cognitive function		
Good	6.572	61.84
Poor	4.056	38.16
Depression		
Yes	1.893	17.81
No	8.735	82.19

The association between depression state and cognitive function, as well as another characteristic of the household member from the fifth wave of the IFLS, is displayed in Table 2. Several variables that influenced depression status were productive age (OR:0.58, 95% CI:0.48–0.70), male gender (OR:0.89, 95% CI:0.81 – 0.99), basic knowledge level (OR:1.49, 95% CI:1.30 – 1.71), medium level of knowledge (OR:1.38, 95% CI:1.20 – 1.58), type of work of government employees (OR:0.62, 95% CI:0.44 – 0.86), employment status in layoffs (OR:1.36, 95% CI:1.22 – 1.51), asthma (OR:1.42, 95% CI:1.07 – 1.90), and good cognitive function (OR:1.24, 95% CI:1.12 – 1.38).

The association between depression state and cognitive function, as well as other characteristics of the household members from the fifth wave IFLS, is displayed in Table 2. Statistical analysis revealed that a household member in the fifth wave of the IFLS with good cognitive function had a 16% lower risk of depression than a household member in the fifth wave of the IFLS with poor cognitive function. (OR: 0.84, 95% CI: 0.77-0.92).

DISCUSSION

This study found that most respondents had a good cognitive function and were not depressed. We found that the risk of depression was significantly lower in the group with better cognitive functioning. Previous studies have also shown a significant link between cognitive function and depression (7). People with severe cognitive problems lack executive function, response inhibition, planning, and performance control. Most patients with depression reported significant cognitive deficits (10). Another study found that significant impairment was observed in 55 of 75 cognitive variables (73%) after the remission of a major depressive episode. These deficits (areas of processing speed, visual selective attention, working memory, verbal learning, and executive function) are generally small (30 [40%] of 75 variables) or moderate (22 [29%]) (11).

Our study found that the majority of the respondents were of a highly productive age, and the majority of depressed respondents were of a highly productive age. An increase in the prevalence of depression across age has been previously reported, peaking in adulthood. Depression was found in more than 7.50% of women aged 15-74 years old and in more than 5.50% of men (2).

Table 2
Association between Depression and Characteristic from Productive Age from Fifth Wave IFLS[a]

Characteristics of Respondents	Depression				Total		Univariate Analysis				Multivariate Analysis			
	Yes		No				'r'	p	OR	CI 95%	AOR	CI 95%		p
	n	%	n	%	n	%								
Age														
Productive	1,764	18.53	7,758	81.47	9,522	100	0.05	0.00	0/58	0.47 0.70	1.62	1.33	1.98	0.00
Highly-productive	129	11.66	977	88.34	1,106	100			1					
Sex														
Male	769	18.80	3,321	81.20	4,090	100	0.02	0.03	0.89	0.81 0.99	1.16	1.05	1.29	0.00
Female	1,124	17.19	5,414	82.81	5,538	100			1					
Education Level														
Low	777	19.59	3,190	80.41	3,967	100	0.04	0.00	1.48	1.29 1.70	0.92	0.82	1.03	0.16
Medium	760	18.40	3.370	81.60	4,130	100			1.37	1.20 1.58				
High	356	14.07	2.175	85.93	2,531	100			-	1 1	0.75	0.64	0.87	0.00
Occupation														
Entrepreneur	241	19.59	989	80.41	1,230	100	0.02	0.47	1.12	0.81 1.55	0.72	0.57	0.91	0.00
Government employee	176	11.84	1,311	88.16	1,487	100		0.00	0.61	0.44 0861	0.98	0.83	1.15	0.84
Private employee	1,329	18.53	5,845	81.47	7,172	100		0.74	1.05	0.78 1.41	1.07	0.81	1.41	0.59
Laborer	92	21.40	338	78.60	430	100		0.22	1.25	0.86 1.82	0.81	0.58	1.12	0.21
Unemployee	55	17.80	254	82.20	309	100			1	1 1				
Work Termination State														
Yes	635	21.16	2,366	78.84	3,001	100	-0.00	0.00	1.35	1.22 1.51	0.79	0.71	0.83	0.00
No	1,258	16.49	6,369	83.51	7,627	100			1					

(*Continue)*

Table 2
Continued

Characteristics of Respondents	Depression				Total		Univariate Analysis					Multivariate Analysis			
	Yes		No				'r'	p	OR	CI 95%		AOR	CI 95%		p
	n	%	n	%	n	%									
Chronic Disease History (no)															
Diabetes	1,863	17.83	8,587	82.17	10,450	100	0.00	0.73	1	0.62	1.38	0.81	0.54	1.21	0.31
Asthma	1,831	17.67	8,532	82.33	10,363	100	-0.00	0.01	1	1.06	1.89	0.69	0.52	0.93	001
Heart Disease	1,867	17.79	8,629	82.21	10,496	100	-0.00	0.00	1	0.73	1.74	0.80	0.51	1.23	0.31
Stroke	1,891	17.83	8,712	82.17	10,628	100	0.01	0.21	1	0.09	1.70	2.13	0.49	9.13	0.30
Cancer	1,822	17.81	8,688	82.19	10,570	100	-0.00	0.81	1	0.55	2.08	0.89	0.03	1.04	0.74
Cognitive Function															
Good	1,089	16.57	5,483	6,572	6,572	100	0.04	0.00	1.24	1.12	1.37	1.20	1.09	1.33	0.00
Poor	804	19.82	3,252	80.18	4,056	100			1						

Another study also reported that the highest percentage of adults suffering from depressive symptoms was 21.00% (18–29 years old), 18.40% (45–64 years old), 18.40% (>65 years old), and 16.80% (30-44 years old) (12). In Indonesia, the prevalence of depression was 27.86% when the respondents were young adults. This indicates that depressive symptoms commonly occur in adults (13).

Education

A previous study showed that college graduates and high school graduates had a lower risk of suffering depression (RR= 0.73; 95% CI, 0.56-0.96) compared to those who did not have a senior high certificate (elementary or junior high graduates) (RR= 0.75; 95% CI, 0.62-0.91). This indicates a significant correlation between depression and educational level (14). Education level can affect depression in many ways. First, people with low education levels may have poor economic resources (13). Second, people with low education levels are usually isolated from society (15).

Employment Termination Status

A previous study showed that a significant increase in depression occurred in people who lost their jobs compared with those who were still working. This relationship is significant (β=1.34, p= 0.00) (16). Another study found that, in a sample of working adults before the lockdown in South Africa, those who lost their jobs or were upset by their employers reported less depression than those who stayed in their work (17).

Cognitive Function

A previous study reported that depression associated with mild cognitive impairment (MCI) may cause different problems (18). Furthermore, depression associated with MCI can increase the risk of developing dementia. Individuals with this condition generally deal with cognitive-related problems, memory problems, executive function, and attention. Moreover, the relationship between depression and cognitive function strongly depends on the measurement period that is being performed (19). A meta-analysis showed that contemporaneous depressive symptoms are a confounding variable that needs to be noted in the measurement of functional cognitive disorders. Individuals who have suffered from cognitive disorders followed by depression need an Integrative Medicine program to prevent dementia (20).

Our study is a pioneer in exploring the relationship between cognitive function and depression in working-age groups. in Indonesia. This kind of study is rarely performed, and a study investigating cognitive function and its relation to depression among seniors has been frequently conducted.

Research Limitation

The limitation of this study is that the use of secondary data restricted us from obtaining clear information and answers about the variables included. The cognitive function variable in our study was only obtained from two out of eight items in the TICS questionnaire. This was because we could not obtain a clear answer or information from the remaining six items in the questionnaire. Second, because a study about the relationship between impaired cognition and depression among productive age groups is rare, we could not provide any study to compare our results with. To overcome this, we provided the existing literature on seniors.

CONCLUSION

This study found a significant association between cognitive function and depression among productive-age household member groups based on the fifth wave of the IFLS. Further research that will investigate more inclusion variables in relation to depression among the productive age groups is necessary. Educating people about a healthy lifestyle, especially stress management, to maintain a healthy lifestyle and positive mindset by health providers is encouraged to prevent depression and improve long-term public health. Creating a specific target for mental health programs in primary health services is important.

CONFLICT OF INTEREST

All author declare there is no conflict of interest

AUTHOR CONTRIBUTION

SA,IZH: Conceptualization, Methodology, Software IZH, RH.: Data curation, Writing–original draft preparation. SA and FS: Visualization, Investigation. SA: Supervision: AK: Software, Validation: SA, FS, IZH,MAR, NY: Writing-reviewing and editing.

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