

Depressive Symptoms Among Individuals With Knee Osteoarthritis

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Abstract- Background: Osteoarthritis (OA) is the most common articular disease in developed countries and the leading cause of chronic disability, mostly knee OA. It's chronic nature results in significant physical and psychological burden, including the development of depressive symptoms. In this present study we aimed to investigate factors related to the development of depressive symptoms in individuals with knee OA. 120 knee OA outpatients were obtained consecutively in this cross sectional study. Multiple linear regression was then used to assess relationships of independent risk factors to depressive symptoms severity measured with Patient Health Questionnaire (PHQ-9). The final multivariate result in the model that fit the factors associated with depression in knee OA patients were income with p value = 0.012 and r value = -0.152, employment with p < 0.001 and r value = -0.473, BMI with p value < 0.001 and r value = 0.233 were found to contribute to depressive symptom scores for as much as 73.5%. Income, employment, and BMI are independent factors related to depressive score.

Index Terms- Depression, knee osteoarthritis PHQ – 9.

I. INTRODUCTION

Osteoarthritis is one of the most common diseases causing physical ability, especially among elderly individuals. Vast majority of affected individuals end up losing productivities and faces limitations in life due to the chronic pain from the condition. A quarter of individuals, 55 years old or older, experience OA to the extent of severe form of physical disability.¹ Depression is characterized by the presence of depressive mood, loss of energy or pleasure. Individuals living with chronic arthritis are more likely to develop depressive symptoms. This leads to escalated medical cost. The nature of OA that leads to chronic pain also alters individual's ability to perform daily tasks, leading to higher risk of developing depressive symptoms.² Study in Tiongkok by Zheng et al. found that 25.4% of individuals with OA significantly experience clinical depression.³

Knowing that development of depressive symptoms is common in individuals with knee OA, we aimed to investigate independent factors related to the development of depressive symptoms.

II. METHOD

This present study is a cross sectional study obtaining individuals with OA from neurology outpatient clinic. Individuals with any history or on-going psychiatric diagnosis were excluded from this study. Samples were obtained consecutively and written informed consent was delivered. A total of 91 participants were obtained for this study. Depressive symptoms were measured by using PHQ-9 and independent risk factors were assessed by using multivariate regression linear.

Initial bivariate analysis was conducted to assess data distribution and determine which independent variables that can be included in multivariate analysis. Cut-off p-value of less than 0.25 was used to determine whether or not the independent variables are eligible for further multivariate analysis.⁴

III. RESULT AND DISCUSSION

Participant characteristics in our study are presented in Table 1. Vast majority of the participants were elders with median age of 61 and male (n = 52, 57.1%).

Table 1. Participants characteristics

Variables	Median	Mean ± SD	n%
Age	61(38-78)		
Gender			
Male			52(57.1)
Female			39(42.9)
Income	4 (2-6)		
BMI		23.79±3.16	
Nuptial status			
Married			57(62.6)
Not married			34(37.4)
Employment			

Yes			54(59.3)
No			37(40.7)
PHQ-9		10.21±2.75	

More than half of participants were employed and received monthly income of IDR 4 million. This monthly income is considered above the standard minimum wage in our country. Participants were mostly married (n= 57, 62.6%) and has mean BMI of 23.79±3.16. We also found that mean score of depressive symptoms occurred in our participants was 10.21±2.75.

Table 2 shows bivariate results of independent variables with depressive score.

Table 2. Bivariate analysis of independent variables

Variable	r	p
Age	0.013	0.261*
Income	-0.778	<0.001*
BMI	-0.170	0.101*
Employment		<0.001*
Nuptial status		0.287**
Gender		0.067**

*Pearson **Mann-Whitney

Multivariate analysis is presented in Table 3. We found that BMI is positively correlated with depressive symptom severity, in which higher BMI indicates more severe depressive symptoms ($\beta = 3.99, p < 0.001$). Income and employment both served as alleviating factor in our study. This indicates that higher income and having job decreases the severity of depressive symptoms among individuals with knee OA (β for income = -3.337, β for employment = -4.40, $p < 0.001$).

Table 3. Multivariate analysis

Variable	β	p
Income	-3.337	<0.001
Employment	-4.40	<0.001
BMI	3.99	<0.001

*Adjusted $R^2 = 74.5\%$

This present study is in line with a study from Deb et al. which also found that jobless individuals with OA is more likely to develop depression (OR=1.55).⁵ Another study from Lee et al. also indicated that escalated depressive symptoms were found in those from middle to lower income family background ($p = 0.097$).⁶ Being jobless imposes individuals to higher risk of not able to provide for self and family, which serves as another significant burden along with the disease itself. This result in decreased availability of income to spare for better and more

optimum medication or to opt for better rehabilitation program, which later costs more and result in longer duration of illness.⁷ Study from Holla et al. also found that BMI is correlated with depressive symptoms among individuals with OA ($r=0.21, p<0.001$).⁹ Obesity is known to be related to depression, due to stigma which results in shame and insecurity, hence obese individuals are more likely to experience much more severe form of depressive symptoms.¹⁰

IV. CONCLUSION

We found that income, employment, and BMI contributed to depressive symptoms among individuals with knee OA.

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