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Prevalence of Depressive Symptoms among Elderly and Its Predictors: A Cross Sectional Study in Community Felda Bukit Goh, Kuantan Pahang

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Abstract

Introduction: The world's population is ageing rapidly. Older people are at risk of having mental illnesses particularly depression but it is often misdiagnosed and undertreated. It affects general wellbeing and daily functions of the patients.

Objectives: To measure the prevalence of depression and its associated factors among elderly living in FELDA Bukit Goh, Kuantan, Pahang.

Methodology: A cross sectional study was conducted from June to September 2018. The participants aged more than 60 years were recruited in this study. A total of 259 participants were randomly selected to complete the interviewed-base questionnaire. The questionnaire consisted of four sections which included the sociodemographic, Geriatric Depression Scale (GDS), Elderly Cognitive Assessment Questionnaire (ECAQ) and Modified Barthel Index (MBI). Descriptive statistics was used to measure the prevalence and logistic regression to explore the association of depression with the background variables.

Results: Out of 259, the majority were female. It was found that 19.3% of them were having depression. The associated factors were elderly without formal education (adjusted Odds Ratio (aOR):2.38, 95% Confidence Interval (CI):1.07-5.31), cognitive impairment (aOR: 3.68, 95% CI 1.29-10.5), and marked dependence (aOR: 3.17, 95% CI: 1.47-6.86).

Conclusions: The prevalence of depression among elderly was considerably alarming. Health personnel whose managing elderly patients should take initiative at any given chances to screen for depression especially among those without formal education, cognitive impairment and marked dependent in their activities of daily living.

Background

The world's population is ageing rapidly. In 2017, United Nation (UN) estimated 962 million people aged 60 or more comprising 13 percent of the global population and their growing rate about 3 percent per year. Western countries often used aged 65 years and above as elderly but the UN agreed cut off of 60 years and above to refer to the older population. Older adults have important contributions to the society and act as 'pillar' in their family.

Generally, most of the elderly people have good mental health, however many of them are at risk of developing mental disorders and co-morbid illness such as diabetes mellitus, hypertension and osteoarthritis. According to World Health Organization (WHO), dementia and depression are most common mental disorders in elderly which account dementia (5%) and depression (7%).

Depression is often misdiagnosed and under treated [1]. It is a disabling condition as it affects general wellbeing and daily functioning [2]. In DSM-5, Major Depressive Disorder (MDD) is syndromes that negatively affect a person's life and consist of symptoms that can ruin the functionality of the individual. The main symptoms are depressed mood and loss of interest or pleasure. If there is presence of five or more following symptoms that had been present for the same two week period, it is sufficient to diagnose as Major Depressive Disorder (MDD).

- a) Depressed mood most of the day
- b) Markedly diminished interest or pleasure

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- c) Significant weight loss or change 5% body weight in a month
- d) Insomnia or hypersomnia
- e) Psychomotor agitation or retardation
- f) Fatigue or loss of energy
- g) Feeling of worthlessness or inappropriate guilt
- h) Diminished ability to think or concentrate
- i) Recurrent thoughts of death

The stigma mental illness among elderly still high as older people are more likely to focus on bodily complaints rather than psychological distress. The prevalence of medical co-morbid is high among elderly age group and often difficult to distinguish with mental disorders. Elderly depression may be seen as a consequence of losses in physical, functional, and social domains rather than an actual disorder that needs to be treated.

A countryside or rural area is a geographical area that situated outside towns or cities. It has low population density compared to town. In Malaysia, the Federal Land Development Authority (FELDA) was established on 1st July 1956 under the Land Development Ordinance (Land Development Ordinance) 1956. It aimed for land development and relocation to eradicate poverty through the cultivation of oil palm and rubber, industrial and commercial social economy. In recent years, Malaysian government has entrusted FELDA to stand with their own financial and become a statutory body that can generate their own income to through a variety of businesses.

A FELDA settler is defined as main person that own and manage a plot of agricultural land given by FELDA. Many of them working in a palm oil or rubber plantations. Felda Bukit Goh was established in 1967 and it is one of FELDA settlement area in Kuantan. Initially there were total of 671 FELDA settlers and their main source of income through oil palm.

This study aimed to measure the prevalence of depression among elderly and its predictors in FELDA settlement in Kuantan, Pahang. Screening for depression is crucial as it is treatable and warrants prompt intervention. If it is left untreated, it may cause significant health burden in the individual and public health implication indirectly.

Methodology

Study design

This was a cross sectional study conducted from June 2018 to August 2018.

Study area

Kuantan, Pahang was selected as a study area.

Target population

Elderly people aged 60 years old and above in Felda Bukit Goh, Kuantan, Pahang.

The inclusion criteria are:

- a) Malaysian citizenship.
- b) Elderly people aged 60 years and above in Felda Bukit Goh, Kuantan.
- c) Able to communicate in Bahasa Melayu or English.

The exclusion criteria are:

- a) Illiterate.
- b) Severe physical and mental disabilities.

Study duration

The study was conducted from June 2018 until August 2018.

Sample size calculation

The sample size was calculated using single proportion formula with total 259 elder lies in Felda Bukit Goh, Kuantan recruited in this study.

Data collection process

Upon approval from the International Islamic University of Malaysia (IIUM) Ethics Committee, permission was obtained from Penghulu Mukim Kuantan 2, FELDA authority and head villager of Felda Bukit Goh before the study was conducted. The survey participants were identified from a comprehensive community census from authority of Felda Bukit Goh. The participants were randomly selected to complete interviewed-base questionnaire.

The interview session was conducted at participant's house. Those who meet the inclusion and exclusion criteria being briefed regarding this study before the consent were obtained. The questionnaire consisted of four sections which included the sociodemographic, Elderly Cognitive Assessment Questionnaire (ECAQ), Geriatric Depression Scale (GDS) and Modified Barthel Index (MBI). The duration of interview ranged from 15 to 30 minutes.

Research instruments

Sociodemographic data: The sociodemographic characteristics consisted of age, gender, race, religion, marital status, occupational status, educational level, total monthly income, family structure, presence of chronic disease, smoking status, alcoholism, and level of exercise and history of fall.

Elderly Cognitive Assessment Questionnaire (ECAQ): Elderly Cognitive Assessment Questionnaire (ECAQ) derived from Mini Mental State Examination (MMSE) and Geriatric Mental State schedule to screen for cognitive impairment in elderly. It was validated in Singapore and useful tool for routine screening. ECAQ is 10 item screening test assessing long term memory, orientation and recall. Each item has a score of 1 for each correct response which ranged from 0 to 10. Participants with score 5 or less were identified as having cognitive impairment. The sensitivity is 85.3% and specificity 91.5% with Crohnbach alpha 0.73 [3].

Geriatric Depression Scale-15 (GDS-15): Geriatric Depression Scale (GDS) is widely used as a screening tool for depression in the geriatric population. Initially the 30-item GDS has been developed to screen elderly for depression [4], as it is time consuming; a shortened version consisting of 15 questions has been developed in 1986. The shorter version of the GDS is easier to use and has better acceptability. The respondents required to answer 15 questions by answering 'yes' or 'no' in reference on how they felt on the day the question was administered. A score 5 or more indicate high risk of depression with sensitivity 88% and specificity 76% [5].

Modified Barthel Index (MBI): The Modified Barthel's Index (MBI) is used to measure the level of disability based on the Activities of Daily Living (ADL) that reflects the dependency in daily activities among the elderly. MBI is a well-established ordinal scale and consist

of ten domains which are bowel control, bladder control, grooming, toilet use, feeding, transfers, walking, dressing, climbing stairs, and bathing. The format is a 10-item scale where each activity is given a score for five levels of dependency ranging from 0 (unable to perform task) to a maximum of 15 (fully independent). A total score is obtained by summing the points which ranging from 0-100. The internal consistency of MBI is Cronbach's alpha 0.90 [6]. Granger *et al*, 1981 took score of 60 as the threshold between marked dependence and independence and being applied by most studies [7].

Statistical analysis

Data was tabulated, cross tabulated and analyzed using SPSS version 23. Categorical data were summarized in actual numbers and percentages. Chi square and Fisher Exact test were used to determine the association between categorical data. The continuous data was expressed in median and inter-quartiles range. Logistic regression was used to explore the association of depression with the background variables and adjusted odd ratio to quantify the risk. Association considered significant when p value was $p < 0.05$.

Ethical consideration

This study was approved by the International Islamic University of Malaysia (IIUM) Ethics Committee on 8th January 2018 (reference number: IIUM/305/20/4/7). An informed consent was obtained from Penghulu Mukim Kuantan 2 on 28th May 2018. A meeting was conducted with the head villager and head officer of Felda Bukit Goh and the approval was given on 7th June 2018.

The participants were briefed about this study before informed consent was obtained. They were freely to participate in this study and confidentiality is assured to all participants. Participants who have depressive symptoms were referred to nearest health clinics for further clinical evaluation by medical officer and family medicine specialist.

Results

A total of 259 out of 283 participants identified agreed to participate in this study giving a response rate of 91.5%.

Table 1 showed the baseline profile of the participants. The majority of the participants were women (57.5%), mean age was 70.97, median income about MYR 1000, being married (66.0%), unemployed (93.1%), lived with family members (95.4%) and received formal education (82.2%). Most of the participants have chronic disease (76.4%), non-smoker (82.6%) and all of them are non-alcoholic (100%). Majority of the participants were not regularly exercised (88.8%), not experienced fall (85.7%) within 1 year, cognitive impairment (7.7%) and marked dependence (15.8%).

Table 2 showed the prevalence of elderly depression in Felda Bukit Goh, Kuantan. There were 50 participants (19.3%) have depression while 209 (80.7%) participants were normal.

Table 3 showed the factors associated with elderly depression among participants. In this study, participants without formal education, cognitive impairment and marked dependent were found significantly associated with depression in elderly.

Table 4 showed significant predictor variables associated with elderly depression. A binary logistic regression was conducted to determine the variables. This model had Nagelkerkr R square 0.18. In this study, elderly without formal education have 2.38 risk of

Table 1: Baseline profile.

Variables	n	%
Age (years)	70.97(5.1) ^a	
Income (MYR)	1000(600,1500) ^b	
Gender		
Male	110	42.5
Female	149	57.5
Marital status		
Single	1	0.4
Married	171	66.0
Divorced/widowed	87	33.6
Occupational status		
Working	18	6.9
Not working	241	93.1
Living arrangement		
Stay alone	12	4.6
Stay with family members	247	95.4
Education status		
No	46	17.8
Yes	213	82.2
Chronic disease		
No	61	23.6
Yes	198	76.4
Smoking		
No	214	82.6
Yes	45	17.4
Alcoholic		
No	259	100
Yes	0	0
Exercise		
No	230	88.8
Yes	29	11.2
History of fall		
No	222	85.7
Yes	37	14.3
Cognitive impairment		
No	239	92.3
Yes	20	7.7
Functional status (ADL)		
Independent	218	84.2
Marked dependent	41	15.8

^amean (standard deviation)

^bmedian (interquartile range)

Table 2: Prevalence of elderly depression.

	N	%
Normal	209	80.7
Depressed	50	19.3

having depression (aOR 2.38, 95% CI 1.07-5.31). Elderly with marked dependent have 3.17 risks for depression (aOR 3.17, 95% CI 1.47-6.86) while cognitive impairment has 3.68 risks for depression (aOR 3.68, 95% CI 1.29-10.50).

Discussions

Response rate

The response rate for this study was 91.5%. A total of 259 out of 283 participants identified agreed to participate in this study. Higher response rate was due to majority of the participants were not working and staying at home when the interview being conducted. There were few participants refused to participate in this study due to time constraints and personal factors. Face to face interview is one of the popular data collection method as it can capture verbal and non-verbal cues and the interviewer can keep the interviewee focus and on track during the session.

Baseline profiles

Sociodemographic profile: This study showed the mean age for

Table 3: Factors associated with elderly depression among participants.

Variables	Depression status		X ²	p value
	Normal n (%)	Depressed n (%)		
Age (years) ^a	70.8	71.7	0.38 ^b	0.26
Income (MYR) ^c	1000 (500, 1500)	1000 (687.5, 1000)	4894.5 ^d	0.48
Gender				
Male	93(84.5)	17(15.5)	1.82	0.18
Female	116(77.9)	33(22.1)		
Marital status				
Single	1(100)	0(0)	2.38 ^e	0.34
Married	142(83.0)	29(17.0)		
Divorced/widowed	66(75.9)	21(24.1)		
Occupational status				
Not working	194(80.5)	47(19.5)	0.09	0.77
Working	15(83.3)	3(16.7)		
Living arrangement				
Stay alone	9(75.0)	3(25.0)	0.26	0.61
Stay with family members	200(81.0)	47(19.0)		
Education status				
No	29(65.9)	15(34.1)	7.44	0.01 [*]
Yes	180(83.7)	35(16.3)		
Chronic disease				
No	54(88.5)	7(11.5)	3.14	0.08
Yes	155(78.3)	43(21.7)		
Smoking				
No	174(81.3)	40(18.7)	0.30	0.59
Yes	35(77.8)	10(22.2)		
Exercise				
No	183(79.6)	47(20.4)	1.68	0.20
Yes	26(89.7)	3(10.3)		
History of fall				
No	182(82.0)	40(18.0)	1.65	0.20
Yes	27(73.0)	10(27.0)		
Cognitive impairment				
No	199(83.3)	40(16.7)	13.11 ^e	<0.01 [*]
Yes	10(50.0)	10(50.0)		
Functional status (ADL)				
Independent	185(84.9)	33(15.1)	15.35 ^e	<0.01 [*]
Marked dependent	24(58.5)	17(41.5)		

^a means (SD); ^bIndependent sample t-test

^c Median (IQR); ^d Mann-Whitney U test

^eFisher Exact test

^{*}p< 0.05, statistically significant

participants were 70.97 and median income was RM1000. During the interview, female participants' accounted higher percentage (57.5%) compared to male participants (42.5%). This may reflect the population of elderly in Malaysia in larger picture. Most of them were married (66.0%) followed by divorced or widowed (33.6%) and single (0.4%). This finding was similar to previous study on social and health profiles of elderly in rural area in Peninsular Malaysia [8].

Majority of the participants were not working (93.1%) and staying with their family members (95.4%). Majority of them received formal education (82.2%) at least primary education level compared to those without formal education (17.8%). There were 76.4% participants suffered from chronic disease, 82.6% were non-smoker, 88.8% were not exercise regularly and 85.7% were not experience fall within one year. All the participants were Muslims and non-alcoholic (100%). A similar profiles done in previous study in where majority of the populations were Malays [8,9].

Cognitive status: In the present study, the prevalence of cognitive impairment among participants was 7.7% while the rest of them have normal cognitive status (92.3%). This result was higher compared to previous study by A. Rashid *et al*, 2015 which reported prevalence of cognitive impairment was 4.8% [10].

Table 4: Significant predictor variables associated with elderly depression.

Variables	Depression				
	B	Wald	AOR [#]	95% CI	p value
Gender					
Male (reference)					
Female	0.15	0.17	1.16	0.58-2.33	0.68
Education status					
Yes (reference)					
No	-0.87	4.53	2.38	1.07-5.31	0.03 [*]
Exercise					
Yes (reference)					
No	-0.66	0.99	1.94	0.53-7.15	0.32
History of fall					
No (reference)					
Yes	0.20	0.19	1.22	0.50-3.00	0.66
Chronic disease					
No (reference)					
Yes	0.78	2.61	2.19	0.85-5.64	0.11
Functional status (ADL)					
Independent(reference)					
Marked dependent	1.15	8.58	3.17	1.47-6.86	<0.01 [*]
Cognitive impairment					
No (reference)					
Yes	1.30	5.95	3.68	1.29-10.50	0.02 [*]

^{*}Significant (p<0.05)

Nagelker R Square was 0.18. This implies that only 18% of variation in this study was explained by this model.

[#] = Adjusted Odds Ratio

A previous study showed the prevalence of cognitive impairment among elderly in nursing care home was 33.3% [11]. Another study by Khaw *et al*, 2009 showed prevalence of dementia in nursing care home was 12.3% and depression 20.6%. Cognitive impairment among elderly was significantly associated with increased age, illiteracy, unemployment and functional dependent on activity of daily living [12]. Other studies worldwide showed the prevalence of cognitive impairment among in elderly Korea 33% [13], India 49.2% [14] and Portugal 16.8% [15].

Activities of Daily Living (ADL): Activities of Daily Living (ADL) is a routine task that being performed on daily basis and assessed the functional status of each individual. Ability in performing ADL is crucial in determine long term care plan in individual and improve quality of life. In present study, the prevalence of participants with marked dependence in their Activities of Daily Living (ADL) were 15.8% while majority of them functionally independent (84.2%). The result was lower compared to previous study reported participants with physical disability was 24.7% and functional limitation was 19.5% [16].

A past study conducted in nursing care homes, it was reported that 61.1% respondents were functionally dependent [11]. Elderly in nursing home face major health problems such as chronic illness, cognitive impairment, depression as well as functional limitation. The prevalence of disability in ADL was 39% in Korea [13] and 9.2% in Nigeria [17]. The difference in ADL dependency in Malaysia and other countries may due to socio-demographic differences and culture. Malaysian culture emphasizes the elderly or frail people should be taken care of by their own family members. Admission to institutionalized care is the last resort that one's family should think of. Normally the nursing care homes are the place for people who have no heir, poor and unable to take care of. Therefore the majority of elderly staying with their family members [18]. Whilst in developed countries, institutionalization is closely related for people with disability in their ADL and the private nursing home is assessable for those who can afford it.

Prevalence of depression

This study found there were 50 participants (19.3%) had depression while majority were normal (80.7%). It was lower than that of a previous similar study done in FELDA community which reported prevalence of depression was 26% [19]. In Malaysia, the prevalence of elderly depression in community ranging from 6.9% to 30.1% [8,20,21]. A median prevalence of elderly depression worldwide was 10.3% [14]. The low prevalence of elderly depression in recent years can be due to presence of screening tools with good validity and reliability and early detection of depression in the community. High prevalence of depression in previous years (1955-1984) may be due to the screening tools not specifically detect depression in community and falsely detect many dementia cases as depressive disorders [14].

Sociodemographic variables and depression

This study showed educational status played significant predictive factor for depression in elderly (aOR=2.38 95% CI: 1.07-5.31). Elderly without formal education have two time risk develop depression compared to those who received formal education. In previous years in 1950's, it is known that there was limited type of work, less chance to get higher education and lack of income source especially in rural area. Majority of the participants in this study received primary education and not many of them pursued to higher level due to poverty. Early life socioeconomic factors made less access to education in this sample.

Adults with lower education tend to earn less in their salaries compared to higher educated counterparts. In Korea, factors that contributed to elderly depression in urban area were increased age and low economic status and in rural area, low education level was the significant predictor [22]. Prevalence of depression in elderly decrease in corresponds to high level of education. The mechanism why higher education may do so remains unknown. Hardship and poverty during childhood age make people unable to get proper education. As they get married and become older, they may face a problem in later life circumstances, poor coping mechanism and develop depression.

Depression was more common in female compared to male gender in this study (aOR: 1.16 95% CI: 0.58-2.33) but the difference was not statistically significant. Being a female, staying alone, presence of cognitive impairment, poor, low educational level, presence of physical illness, lack of social support, functionally disabled among the risk factors of depression in elderly [16,23,24].

In the present study, the prevalence of elderly who have not practising regular exercise was 88.8%. Depression was more common in elderly who were not having regular exercise compared to those practising regular exercise (aOR: 1.94 95% CI: 0.53-7.15) however the result was not statistically significant. A previous study by Ying *et al*, 2019 showed the overall prevalence of physical inactivity in elderly aged more than 60 years old was 48.8%. It was significantly associated with females, older age groups, Indians, functional limitations and without formal education and sedentary lifestyle [25].

In this study, depression occurred more common in unemployed elderly however this finding was not significant. The median household income per month among respondents in this study was RM 1000. Generally the elderly earn less of their income compared to adult general population. Being unemployed give rise to financial burden as they need to rely on the other people.

Other variables

Cognitive impairment: This study found cognitive impairment was a significant risk factor for depression in elderly ($p < 0.01$; aOR: 3.68). Elderly with cognitive impairment have three times risk for depression compared to elderly with normal cognitive function. The prevalence of depression in elderly with normal cognitive function was 16.7% (n=40). It was consistent with previous studies reported cognitive impairment was one of the risk factor for depression in later life [9,24]. A previous study showed the level of education had significant factors on cognitive functions such as intellectual efficiency, attention, executive function and memory [26]. Khaw *et al*, 2009 found elderly with illiterates were six folds more likely to be cognitively impaired compared to those with literates [12].

Depression in elderly is often accompanied by dementia and cognitive impairment. Elderly Cognitive Assessment Questionnaire (ECAQ) and Mini Mental State Examination (MMSE) are commonly screening tool to assess for cognitive status. Individuals with lower score during screening should be referred to psychiatrics for further evaluation of cognitive impairment or dementia. In this study, among elderly with cognitive impairment, 50% were demented and 50% were pseudodementia.

Dementia is a syndrome characterized by behavioral, cognitive and emotional impairments. There are few types of dementia such as Alzheimer's disease, Vascular Dementia (VaD), Lewy Body Diseases, Frontotemporal Dementia and Mixed Dementia. It is often one of the cofounder in cross-sectional studies for depression in elderly. It is challenging to differentiate between dementia, depression and normal aging process among elderly people. Pseudodementia is a situation where a person with depression may present with cognitive impairment. A person with depression may present with cognitive symptoms such as problem concentrating, difficulty in thinking and problem solving. It is reversible as once the depression is successfully treated, the cognitive symptoms will improved. Treatment for pseudodementia therefore would essentially be the same as treatment for depression such as Selective Serotonin Reuptake Inhibitors (SSRI), Monoamine Oxidase Inhibitors (MAOI), tricyclic antidepressant as well as psychotherapy. Both medication and psychotherapy may take several weeks before decrease in symptoms noticeable.

Activities of Daily Living (ADL): An individual with disability has long term physical, mental, intellectual or sensory impairments that may prevent from full participation in society. These disabilities can be accessed through the Activities of Daily Living (ADL), the routine tasks performed by each individual on a daily basis. Elderly with marked dependence on ADL was found to have significant risk factors for elderly depression ($p < 0.01$, aOR: 3.17) in this study. They have three time risk to develop depression compared to people who were independent. It was similar to previous studies that being disabled and functional dependence have significant risk for depression [9,12,18,27].

Physical disability and functional dependent are common in elderly and lead to consequences such as dependency, negative impact to the families and health care system or even institutionalization. Older people with marked dependence tend to become socially isolated and loss of functional autonomy thus can lead to mental health problem.

Conclusions

This study showed elderly without formal education, cognitive

impairment and marked dependence were significant predictors for depression. These findings are important as enable the health care providers to identify older people who are at risk developing depression. Individuals who screened for depression could be referred to mental health professionals for comprehensive assessment and intervention. Good intervention may improve quality of life and decrease morbidity and mortality.

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