A Case Control Study on Factors That Influence Depression Among the Elderly in Kuala Lumpur Hospital and Universiti Kebangsaan Malaysia Hospital

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SUMMARY

Depressive illness is common among the aged population. A case control study was conducted, focusing on risk factors influencing depression among the elderly. This study involved 130 elderly patients diagnosed to have depressive illness from the psychiatric clinics of Kuala Lumpur Hospital (HKL) and Universiti Kebangsaan Malaysia Hospital (HUKM). Another group of 130 elderly patients with no history of depressive illness were recruited from the medical specialist clinics. The majority of cases were female (75.4%), aged 60 – 74 years (92.3%) and from Chinese ethnic group (59.2%). Non-Malay elderly has three times risk (AOR 2.537, 95% CI 1.439 - 4.471) of suffering the depressive illness compared to the Malay elderly, the elderly with chronic health problems are more likely to be depressed compared to those who do not suffer from any chronic illness (p trend <0.001). Other risk factors identified were family history of depression with four times risk (AOR 4.225, 95% CI 2.017 - 8.848) and lower social support with eight times risk (AOR 7.949, 95% CI 2.588 - 24.417). Social support is not only important in encouraging the elderly to practice healthy life style but proven to influence the risk of getting depression among them. Hence, it is very crucial that the elderly is given total attention, respect and love from all parties to ensure prosperity and meaningfulness in life.

KEY WORDS:
Depression, Risk factors, Social support, Chronic disease, Elderly, Malaysia, Case control study

INTRODUCTION

Ageing is an inevitable global phenomenon. Malaysia too is facing the same challenge. Malaysia defines the elderly as persons aged 60 years and above. This definition is also stated in its National Policy for the Elderly which was coined in 1995. In 2003, 6.7% out of 26 million people in Malaysia comprised of individuals 60 years and above and it will increase to 9.9% in 2020[1] during which Malaysia will be categorized as an ageing population.

Depression is an emotional condition which extends beyond normal sadness. It has been shown to be a common mental illness among the elderly[2]. The second National Health and Morbidity Survey (1996) showed that the prevalence of mental problems among the elderly was 26%[3]. Studies carried out in several local health clinics found the prevalence of depression among elderly was 14% in 1998[4] and 18% in 1999[5]. Meanwhile by locality, prevalence of depression among elderly in the rural areas was 7.6%[6] compared to 6.3% in urban areas[7]. Another study among the Malay elderly living in rural areas showed a prevalence of 27.8%[8]. Elderly staying in institutions, showed a higher prevalence of depression which was 37% in 1997[9] and 67% in 2006[10].

In Japan, a community study involving a large cohort of elderly people in the Nangai Village, Japan showed a prevalence of depression at 22.3%[11]. Reviews from cross sectional and cohort studies involving populations of elderly Caucasians revealed that the prevalence of depression among the elderly was 0.9% to 9.4% for those staying in their own house, 14% to 42% those staying in institutions and 1% to 16% for those living in the community[12].

Elderly people have high morbidity rates and are among those who had the most frequent appointments with doctors and hospitalisations[13]. World Health Organization (WHO) expects depression to be one of the major factors causing premature deaths and disability in the world by the year 2020. With regards to disease burden, depression was noted as fourth place in 1990 and is expected to be second after ischaemic heart disease in the year 2020[14].

Hence, this study was undertaken to identify the possible risk factors of depression among the elderly in order to enrich the knowledge regarding depression and it's comprehensive management so that these individuals could enjoy a better quality of life.

MATERIALS AND METHODS

This case control study was carried out at Kuala Lumpur Hospital (HKL) and Universiti Kebangsaan Malaysia Hospital (HUKM). Cases comprised of elderly patients who had been diagnosed of having depressive illness and were treated at the psychiatric clinics at these institutions. Depressive illness includes those with diagnoses of adjustment disorder with depressed mood, major depressive disorder and dysthymic disorder. The samples were universally selected. They were identified through the register and clinic records. The control group comprised of elderly patients who were attending the Medical Specialist clinics during the course of this study and

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had never been diagnosed to have any forms of depressive illness before. The Elderly was defined as anyone aged 60 years and above. Screening to rule out depressive symptoms among the control group was carried out using the Geriatric Depression Scale (GDS) (15). Those who scored above six were excluded. Based on standard sample size calculation[16], a minimum of 130 pairs of respondents were needed.

All respondents were interviewed by the researcher using a guided questionnaire which comprised of five sections: respondents' socio demographic and socioeconomic status; lifestyle which include physical activities, smoking and alcohol consumption; Geriatric Depression Scale (15) with Alfa Cronbach's Value for the questions was 0.84 specificity[17]; activities of daily living using Barthel Index[18]. A respondent is categorized independent if he or she can perform all 10 activities independently and a respondent is categorized as dependent when he or she has difficulty in performing one or more of the activities. Finally the Lubben Social Network Scale (LSNS)[19] which measures social support is applied. The LSNS is a brief instrument designed to gauge social support received by family, friends and neighbours. It consists of an equally weighted sum of 10 items used to measure size, closeness and frequency of contact of a respondent's social network. All data were coded, entered and analysed in SPSS version 13. Multivariate analyses of logistic regression was used to determine the adjusted odds ratio for risk of depression with independent variables.

RESULTS

A total of 260 from 270 elderly people were successfully interviewed as respondents. The samples consisted of 130 people as cases and another 130 people as the control. The response rate was 96.3%.

Socio-demographic data

The average age for respondents was 67.53 ± 5.73. The minimum age was 60 with a maximum of 84. The majority of cases (92.3%) and controls (84.6%) were between 60 to 74 years old. A larger proportion of the cases were Chinese (59.2%) to be followed by Malays (25.4%), Indians (11.5%) and other races (3.8%) such as the Sikh, Eurasians dan Indonesians. Meanwhile for the control group, the majority were Malays (50%), then followed by Chinese(40.8%), Indian (8.5%) dan 0.8% other races. In terms of gender, majority (71.9%) were female (see Table I).

The only factor showing significant difference was race where chi square was 16.77 and $p<0.001$. It showed that non Malay elderly had three times (OR 2.94, 95% CI 1.74 - 4.96) risk of suffering from a depressive illness compared to a Malay elderly.

Majority of the respondents had lower educational level. They either did not attend school at all or had education up to a primary school level. Most of them 156 (60%) were married, the rest were widowed. Majority of the respondents 237(91.2%) were unemployed and 23(8.8%) were still working. In terms of monthly income, the case group received an average of RM550.00 (calculated from the median of family income with inter-quartile range RM300.00 - 1225.00) as income per capita where as control group received an average of RM500.00 (calculated from the median of family income with inter-quartile range RM200.00 – 925.00) as income per capita. In terms of living arrangement, 234 elderly (90%) were staying with their spouses or children and only 26 elderly (10%) were living on their own.

Lifestyle factors

There was no significant statistical difference between the two study groups in terms of lifestyle factors (refer Table II). Majority or 231 elderly (88.8%) either had never smoked or had quit smoking. This study showed that there was no significant difference between these two groups.

With regards to their physical activity, 139 elderly (53.4%) were active meanwhile 121 elderly (46.6%) claimed that they ignored physical fitness. Two hundred and forty nine elderly (95.8%) had never consumed alcohol whilst only 11 elderly (4.2%) were occasional drinkers. This study showed that there was no significant difference between these two groups with regards to physical activity.

Health factor

Table III shows that only a small number of elderly had family history of depression. Among the elderly who had depression, 90 (69.2%) did not have any family history of depression. While 118 from the control group (90.8%) too did not have family history of depression. However, there was statistical difference in risks for depression between these two groups. Elderly with family history of depression had four time risks to experience depression (OR 4.37, 95% CI 2.168 - 8.810).

Ninety-eight (75.4%) of the depressed group and 130 people (100%) of control group had one or more chronic diseases. Thirty-two elderly (24.6%) from the depressed group were not having any chronic illness. The study showed that the elderly with multiple chronic diseases had higher risks to get depression where p trend is < 0.001.

Based on the figure in Table III, there is statistical difference between case group and control group in daily living activity. There were 10(7.7%) of case group experiencing problems of daily physical functions compared to 1(0.8%) control group. One hundred and twenty cases (92.3%) and 129(99.2%) of control group had good physical function respectively. The study showed that the elderly with physical function problems had eleven times risk to experience depression (OR 10.750, 95% CI 1.356 - 85.243).

Social support

Table IV shows the relationship between social support and depression, where majority of the respondents received good social support from their family and friends as well as from the types of living conditions. It showed that 102(78.5%) of the case group and 126(96.9%) of the control group received good social support. Only 28(21.5%) of the case group received low social support and 4(3.1%) of the control group had lower social support. There was a significant statistical difference between these two groups in which chi square test was 20.526 and $p < 0.001$. Hence,

elderly with less social support had nine times more risks of developing a depressive illness (OR 8.647, 95% CI 2.937 - 25.455).

Multiple logistic regression test was done and results indicated that the non-Malays had three time risks of developing a depressive illness (AOR 2.537, 95% CI 1.439 - 4.471). The elderly with a family history of depression had four time risks (AOR 4.225, 95% CI 2.017 - 8.848) while the elderly with lower social support had eight times risks of developing a the depressive illness (OR 7.949 95% CI 2.588 – 24.417).

DISCUSSION

Depression which is serious enough to be diagnosed as a depressive illness can occur at all ages, and the risk to suffer from the illness increases as the person gets older [20]. This study showed that most of the elderly who experienced depression were between the ages of 60 to 74. A cross sectional study in Brazil showed that depression can also happen to the young old group which is born in a rural area, not married and with low income [21]. But this study did not show a statistical difference in ages with depression.

For socio-demographic factors, it is found that only ethnicity factor is significant. The study shows that the Chinese elderly had the highest percentage of depression, followed by the Malays, Indians and other races. The study also showed that the non-Malay elderly had three times risks of being depressed compared to the Malays (AOR 2.537, 95% CI 1.439 - 4.471). The same findings were observed in the cross sectional study where more non-Malay elderly in town experienced depression ($p = 0.028$)[7].

This study revealed that more elderly female than elderly male have depressive illness. This could be due to several reasons: female elderly lived longer because they cared more for their health and the decrease in fertility rate in this age group also lessen the risks of birth complications. However, this study was not able to show any statistical difference in depression between the sexes.

Most of the elderly subjects who had a depressive illness were not working [15]. The physical changes of ageing could have affected their ability to hold on to jobs which require more strength and energy. However, this study did not show any statistical difference between the status of their present job and depression.

Majority of the elderly from the case and control groups were of lower education background. Half of them did not receive any formal education at all. A Study in 2001 suggested that lack of opportunity and no facilities for education in rural areas could contribute to depression[22]. However, this study did not show any statistical difference between the level of education with depression.

Marriage is a protective factor against depression among the elderly[23]. A cross-sectional study in Brazil revealed that the elderly faces high risk of developing depressive illness when they lost their spouses or undergo divorces [24]. Similarly, local community study showed that for the unmarried elderly with lower education and income, losing their partners meant that they faced high risks of depression[25]. However, this study did not show any statistical difference among the married and single elderly and the risk of developing a depressive illness.

A majority of the elderly lived with their family. However this study could not show the influence of living arrangement (staying alone or with family) on depression. This was because this study was conducted at the same hospitals where the samples were of similar background.

Depressive illness tends to be familial[15]. A cohort study in England noted that 72.7% elderly who were depressed have family history of depression [26]. This study also showed that the elderly with a family history of depression had four times risk in developing a depressive illness (AOR 4.225, 95% CI 2.017 – 8.848). Eventhough this is a non-modifiable factor, the individual should be informed of their risk so that they can take preventive action.

Elderly people tend to have co-morbid medical problems. A local cross sectional study also revealed that the prevalence of depression was higher among the elderly who have chronic diseases, which was 9% compared to the elderly who did not have depression (5.6%) [25]. Another cross sectional study also showed that the elderly who lived in urban areas and had chronic diseases were associated with depression ($\chi^2 = 4.812$, $p = 0.028$) [6]. Oshin DW *et al.* also showed that having a chronic disease was a risk factor for depression among the elderly. Prevalence of depression could increase from 10% to 30% for elderly who had chronic diseases[26]. Another cross sectional study among the Turkish elderly showed that they had four times risks in developing a depressive illness (OR 4.11, 95% CI 1.35 – 12.57) [27]. This study also showed that elderly with multiple chronic diseases are at higher risk of developing depression where p trend is < 0.001.

For daily living activities, Sherina *et al.* in her cross sectional study among the elderly in a rural community showed that 23.3% of elderly had problems with this activities of daily living. Those elderly with problems of activity of daily living have five times risk to experience depression (OR 4.52, 95% CI 1.90 – 10.79) [6]. A study in the United States also noted problems of activity of daily living as a risk for depression for the elderly (OR 6.00, 95% CI 4.26 – 8.44) [28]. However, after multivariate analysis, this study did not show any relationship between activities of daily living with depression among the elderly. This could be due to the small sample size.

The life style of the elderly can be a contributing factor to experience depression. However, smoking did not show any significant difference in the depressed elderly. It is because the definition of independent variables just concentrated on qualitative exposure. It should also concentrate on the type, duration and age when the habit started. Other studies showed that smoking can increase risk of getting a depressive illness [29, 30, 31].

Previous studies by Copeland *et al.* have shown that alcohol consumption can be related to depression among the elderly

Table I: Distribution of sociodemographic data of the case and control groups

Sociodemographic factors	Case n=130 (%)	Control n=130 (%)	χ^2 test (p value)	Crude odd ratio	95% confidence interval
Age					
75 -84	10 (7.7%)	20 (15.4%)	3.768	0.46	0.21 – 1.02
60 – 74	120 (92.3%)	110 (84.6%	(0.052)		
Sex					
Female	98 (75.4%)	89 (68.5%)	1.543	1.41	0.82 – 2.43
Male	32 (24.6%)	41 (31.5%)	(0.214)		
Race					
Non Malay	97 (74.6%)	65 (50%)	16.77	2.94	1.74 – 4.96*
Malay	33 (25.4%)	65 (50%)	(<0.001)		
Marital status					
Single/ widow	51 (39.2)	53 (40.8)	0.64	0.94	0.57 – 1.54
Married	79 (60.8)	77 (59.2)	(0.80)		
Educational level					
Low	85 (65.4)	94 (72.3)	1.453	0.723	0.43 – 1.23
High	45 (34.6)	36 (27.7)	(0.228)		
Living arrangement					
Living alone	16 (12.3)	10 (7.7)	1.538		
Living with			(0.215)	1.684	0.734 – 3.865
family	114 (87.7)	120 (92.3)			
Present Job					
Not Working	120 (92.3)	117 (90)	0.429	1.33	0.56 – 3.16
Working	10 (7.7)	13 (10)	(0.512)		

*p value is significant if $p < 0.05$

Table II: Life style factors between the study and control groups

Variable	Case n=130 (%)	Control n=130 (%)	χ^2 test (p value)	Crude odd ratio	95% confidence interval
Smoking					
Yes	11 (8.5)	18 (13.8)	1.902	0.575	0.260 – 1.271
No	119 (91.5)	112 (86.2)	(0.168)		
Physical activity					
No	57 (43.8)	64 (49.2)	0.757	0.800	0.494 – 1.312
Yes	73 (56.2)	66 (50.8)	(0.384)		
Alcohol					
Yes	7 (5.4)	4 (3.1)	0.854	1.793	0.512 – 6.278
No	123 (94.6)	126 (96.9)	(0.355)		

Table III: Health factors between the study and control groups

Variables	Case n=130 (%)	Control n=130 (%)	χ^2 test (p value)	Crude odd ratio	95% confidence interval
Family History Of Depression					
Yes	40 (30.8)	12 (9.2)	18.846	4.370	2.168 – 8.810
No	90 (69.2)	118(90.8)	(<0.001*)		
Chronic Diseases					
Nil	32 (24.6)	0			
1	46 (35.4)	58 (44.6)	21.820		
≥ 2	52 (40)	72 (55.4)	(<0.001*)		
Activity Daily Living					
Dependent	10 (7.7)	1 (0.8)	7.689	10.750	1.356 – 85.243
Independent	120 (92.3)	129(99.2)	(0.006*)		

*p value is significant if $p < 0.05$

Table IV: Social support between the study and control groups

Variables	Case n=130 (%)	Control n=130 (%)	χ^2 test (p value)	Crude odd ratio	95% confidence interval
Social Support					
Low	28 (21.5)	4 (3.1)	20.526	8.647	2.937 – 25.455
High	102 (78.5)	126(96.9)	(<0.001*)		

* p value is significant if $p < 0.05$

Table V: Logistic regression model for expecting Depression

Risk Factors	Regression coefficient (β)	Standard error	Wald	p value	Adjusted odd ratio	95% confidence interval
Ethnic						
Non Malay (1)	0.931	0.289	10.363	0.001*	2.537	1.439 – 4.471
Malay (0)						
Family History of Depression						
Yes (1)	1.441	0.377	14.596	<0.001*	4.225	2.017 – 8.848
No (0)						
Activity Daily Living						
Dependent(1)	2.019	1.103	3.350	0.067	7.529	0.867 – 65.409
Independent(0)						
Social Support						
Low (1)	2.073	0.573	13.109	<0.001*	7.949	2.588 – 24.417
High (0)						
Constant	- 1.110	0.243	20.905	<0.001	0.330	

* p value is significant if $p < 0.05$

Table VI: Univariate and multivariate models with study items associated with Depression

Items	Crude odds ratios Univariate models	95% Confidence intervals	Adjusted odds ratios Multivariate model	95% Confidence intervals
Ethnic	2.940	1.74 – 4.96	2.537	1.439 – 4.471
Family History of Depression	4.370	2.168 – 8.810	4.225	2.017 – 8.848
Activity Daily Living	10.750	1.356 – 85.243	7.529	0.867 – 65.409
Social Support	8.647	2.937 – 25.455	7.949	2.588 – 24.417

with OR 4.4 [32]. However, this study did not reveal any significant findings in the relationship between alcohol drinking and depression. It is because the number who consumed alcohol is too small which was 5.4% from case group and 3.1% from control group. Furthermore, alcohol drinking is not common among the Malays as alcohol is prohibited in Islam.

The elderly who were physically inactive had higher risks of mortality and morbidity. Few studies showed that physical activities can be a protective factor for depression [30, 31]. However, this study is not able to show the differences in risk. It is because the definition of independent variables just concentrated on qualitative exposure.

Social support is important in a community because it gives support and helps the elderly. Good support plays an important role to ensure individuals and family members take care of the elderly. The support will however eventually change because of socidemographic changes. Migration and the nuclear family can lessen the support, which in turn can be a problem to the elderly. This study found that elderly with low social support had eight times risks in developing depressive illness (AOR 7.949, 95% CI 2.588 – 24.417). Another local study also showed that the Malay elderly living in rural areas and having low social support would have seven times risks for depression (OR 7.35, 95% CI 2.13 – 25.32) [33].

There were some limitations in this study. This study was carried out on elderly who were seeking treatment at HKL and HUKM only. So the study cannot be generalised to a general population study and as it did not represent all the elderly living in Malaysia. It would have been better if the case and control group were from the community. Exposure factors in the hospital patients might be different from that of the general population, such as a higher percentange of smoking, alcohol consumption, having chronic diseases and higher awareness of health information and knowledge. Information bias was also present because some respondents may not give accurate answers because of recall bias.

CONCLUSION

In the present study, not all sociodemographic data seemed to be related to higher risk for depression in the elderly. The significant association with risks for depressive illness is ethnicity. The other risk factors are a family history of depression, having multiple chronic illnesses and having low social support. Social support is not only important in encouraging the elderly to practice healthy lifestyle but is proven to influence the risk of getting into depression. Hence, identifying risk factors for depression among primary health personnels and clinician is important in the elderly so as to monitor early symptoms of the illness and offering early interventions. This can reduce suffering and improve their quality of life. The government, non-governmental organisations, community and family members must together play a big role to help these elderly.

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