Cognitive Impairment And Depression Among Residents Of An Elderly Care Home In Penang, Malaysia
C Khaw, C Teo, A Rashid

Citation

Abstract
Introduction: Cognitive impairment and depression are two common mental health problems among the elderly especially in an old folk’s home. Aim: to determine the prevalence of dementia and depression and their associated risk factors among residents of a privately run old folks home in Penang Malaysia. Materials and methods: A cross sectional study was used as the study design. Besides the base line demographic data elderly cognitive assessment questionnaire and geriatric depression scale was used to screen for cognitive impairment and depression. Results: out of the 190 eligible participants 155 responded. The prevalence of dementia was 12.3%. Age (p= 0.032), illiteracy (OR 5.57), unemployment, (OR 9.33) and being functionally dependent on the activities of daily living (OR 4.52) were significantly associated with cognitive impairment. History of unemployment (OR 9.88) and being illiterate (OR 5.22) were found to be significant predictor variables for cognitive impairment. The prevalence of depression was 20.6%. Being functionally dependent on the activities of daily living (OR 2.67) was found to be significantly associated with depression. Being functionally dependent (OR 2.87) was also found to be a significant predictor variable for depression. Conclusion: a systematic screening programme which can be used by the staffs of an old folk’s home should be implemented to identify residents who are depressed or cognitively impaired.

INTRODUCTION
The baby boom in the fifties, the recent advances in medical science coupled with the provision of good health care have undoubtedly contributed to a marked increase of the elderly population. In fact, it is estimated that the population of elderly is going to increase by about 21% in the coming 50 years and the number of elderly people living in the Western Pacific region will double over the next few decades. Malaysia, by the year 2035 or even earlier, will be labelled an ageing country as the rise of the elderly population will reach up to 15% by then.

In Malaysia most of elderly population are, generally, taken care by family members. In the last decade there’s an increasing tendency to place elderly in either public or private residential houses. Impaired memory and mood changes are among overlapping symptoms of dementia and depression quite prevalent in elderly residential and nursing homes.

COGNITIVE IMPAIRMENT
Cognition declines with aging. Mild cognitive impairment turns into dementia with an estimated rate of 10% each year. Elderly population, and of particular female gender, are at higher risk for dementia. Reported new cases of dementia are alarmingly high in the developing countries. The financial burden faced by these developing countries may be more than can be handled by them as the cost of home and institutional care for demented patients is very high.

DEPRESSION
Depression is used in a broad sense to describe a syndrome that includes a constellation of physiological, affective and cognitive manifestations. Depression may range in severity from mild symptoms to more severe forms that include delusional thinking, excessive somatic concern and suicidal ideation over long periods of time. Prevalence of depression in the Asia-Pacific region is comparable to that of the Western world. Depression is the most common psychiatric disorder in the elderly; it is commonly misdiagnosed and under treated. The untreated depressed elderly have significant clinical and social implications as these disorders decrease an individual’s quality of life and increase dependence on others. Depression causes functional impairment and imposes an immense burden on individuals, communities and health services.
There have been reports suggesting that elderly people with depression appear to be at a greater risk of developing dementia and cognitive decline\textsuperscript{11,12}. This strong association between depression and cognitive impairment may even be bidirectional\textsuperscript{13}.

Geriatrics and psycho geriatrics are emerging specialties in Malaysia, so to date there has been relatively little research in these areas. There is a dearth in research on dementia and depression among the residents of elderly care institutions in Malaysia.

The objective of the study was to determine the prevalence of dementia and depression and their associated risk factors among residents of a privately run old folks home in Penang, Malaysia.

**MATERIALS & METHODS**

Setting: this study was conducted in 190-bed non-governmental charity elderly care residential house in Penang, Malaysia where only those aged above 60, having no children, homeless or lacking funds for self-care are admitted.

Study Design: a cross-sectional study was chosen as the study design to achieve the objective of the study. The study was conducted in May 2010.

Sampling: participants were taken from among the residents of this institution. Only residents who consented and were not debilitated with an illness which rendered them unable to communicate effectively were recruited in this study. In addition, only respondents who were not cognitively impaired were selected to undergo screening for depression.

Instruments: the data was collected by trained research assistants using a questionnaire especially designed for this study. Elderly Cognitive Assessment Questionnaire (ECAQ) and Geriatric Depression Scale (GDS) were used to determine whether the respondents were cognitively impaired or depressed. ECAQ is a ten-item screening test assessing long-term memory, orientation, and recall validated in Singapore and is a useful tool for routine screening. It is used in the developing world for patients who may be illiterate or have a relatively low level of education\textsuperscript{14}. A score of 7 or more is indicative of normal memory, 5-6 borderline, and score of 4 and below indicate probable dementia. The Geriatric Depression Scale (GDS) is a questionnaire which is widely used as a diagnostic tool for depression in the elderly worldwide\textsuperscript{15}. The participants were asked to respond to 30 questions by answering ‘yes’ or ‘no’ in reference to how they felt on the day the questionnaire was administered. Scores of 0-9 indicated normal, 10-19 mild depression and 20-30 indicated severe depression. GDS was found to have 92% sensitivity and 89% specificity when evaluated against diagnostic criteria. The validity and reliability of the tool have been supported through both clinical practice and research. The validated Malay\textsuperscript{16} version was used in this study.

In addition, Barthel index\textsuperscript{17} which is a well-established and commonly used nursing tool\textsuperscript{18} was used to assess the functional independence in activities of daily living (ADL) of the participants. The participants were categorized as independent and dependent according to this index.

Body mass index which is used to accurately determine a person’s nutritional status\textsuperscript{19} and blood pressure was measured using standardized methods.

Analysis: analysis was done using SPSS version 13. Bivariate and multivariate analyses were conducted and odds ratio was used to estimate risk. A probability value of $p<0.05$ was considered to be significant.

**RESULTS**

Out of 190 residents who were eligible to participate, 155 responded giving the response rate as 81.6%. The age of the participants ranged from 60 to 98 years with a mean age of 76.3 years (SD ±7.9). As shown in table I, most were females, in the 70-79 age group, Chinese, Buddhist, single and had the highest level of education up to primary school. Most gave the history of having been employed before. Majority named their siblings as the next of kin. Most of the respondents had normal BMI, were not diabetic and were functionally independent as shown in table II. However, 62.6% (97) were hypertensive.
COGNITIVE IMPAIRMENT

The prevalence of cognitive impairment was 12.3% (19). As shown in table III, there is a statistical significance between age and cognitive impairment (p=0.032). Illiterates were six folds more likely to be cognitively impaired compared with literates (OR 5.57, 95% CI 2.02-15.34). Participants with history of unemployment were 9 times (OR 9.33, 95% CI 2.88-30.20) more likely to be cognitively impaired. Those who were functionally dependent were 5 times (OR 4.52, 95% CI 1.54-13.29) more likely to be cognitively impaired compared to those who were independent. Factors like gender, race, religion, marital status, next of kin, presence of chronic illness and nutrition were not found to be significantly associated with risk of dementia.
A binary logistics regression was done using ADL, history of employment, age and education as predictor variables as shown in Table IV. History of employment (OR 9.88, 95% CI 2.49;31.21) and education (OR 5.22, 95% CI 1.66-16.38) were found to be significant predictor variables. The model had -2 likelihood ratio of 83.508, Cox and Snell R squared 0.186 and Nagelkerke R square 0.354.

### DEPRESSION

Out of the 155 residents who had participated in the survey, 19 were ineligible for assessment using the GDS as they scored less than 5 in the ECAQ assessment. The remainder 136 were screened for depression using GDS. The prevalence of depression in this study was 20.6% (28). Five (3.7%) had severe depression and 23 (16.9%) had mild depression.

As shown in Table V, residents who were functionally dependent (OR 2.67, 95% CI 1.14-6.25) were almost three times more likely to be depressed compared to residents who were functionally independent. Factors like gender, age, race, marital status, education level, previous occupation, next of kin, presence of chronic illnesses and BMI were not found to be significantly associated with depression.
A binary logistics regression was done using disability, gender and BMI as predictor variables as shown in table VI. Being functionally dependent (OR 2.87, 95% CI 1.181-6.983) was found to be a significant predictor variable. The model had -2 likelihood ratio of 129.364, Cox and Snell R squared 0.062 and Nagelkerke R square 0.097.

**DISCUSSION**

**COGNITIVE IMPAIRMENT**

Dementia characterized by a decline in memory, language and other cognitive functions, is known to be a common problem among the elderly. It is expected that the number of people inflicted with dementia will double in the next 20 years\(^7\). In the present study, the prevalence of cognitive impairment among residents in the old folk’s home was considerably lower than in studies done elsewhere, where the prevalence of dementia in residential and nursing homes was reported as high as 80%\(^{19}\). The prevalence of cognitive impairment in this study is also lower than that of a similar study carried out in a state run residential home in north Malaysia which recorded a prevalence of 36.5%\(^{20}\). Similar high prevalence rates were also noted in studies conducted in nursing homes in Singapore (48%)\(^21\) and the United Kingdom (66.9%)\(^22\). Generally, cognitive impairment rates are much higher in institutions for the elderly than in the community. But the prevalence rate of this study is even lower than the prevalence rates of cognitive impairment in other community based studies in Malaysia\(^{23,24}\). Possibly because being a privately run institution, it is incapable of managing demented residents and hence it refers them to either government run institutions or the next of kin are told to take them back for nursing care.

Although dementia is not a natural part of ageing, its
prevalence increases with age. The finding of this study concurs with the findings of other studies conducted locally and abroad which shows that the prevalence of moderate to severe cognitive impairment increases steeply with age.

Association between the dependence on the activities of daily living and cognitive impairment was significantly proven in this study as well as another study carried out among residents of an old folk’s home in north Malaysia. This is because the loss of a patient's ability to independently perform daily activities is an important aspect of the disease. In fact, a study has shown that relatively small degree of loss of cognitive skills in patients with mild-to-moderate dementia can lead to an increased risk of losing the ability to live independently.

Residents who were previously unemployed and those who were illiterate had higher risk of being cognitively impaired. Research has also shown that each additional year of education is associated with an 11 percent reduced risk of developing dementia, as those with higher education were better able to compensate for the effects of the brain disorder. Studies have suggested that physical activity, mentally demanding work and higher managerial positions have a positive cognitive status in later life. This fact may explain for the low prevalence of cognitive impairment in this study where 71.6% of the residents were literate and over 90% of them were previously employed. But not all types of occupations have a protective effect towards cognitive impairment. Studies conducted in France and Taiwan found that people in lower class of occupations have a higher risk of cognitive impairment. Possible explanations for the association of occupation and cognitive impairment could be due to the higher exposure to toxic exposures, the levels of psychosocial stress in different occupations and the level of mental stimulation required in the job.

DEPRESSION

As with the prevalence of cognitive impairment, the prevalence of depression in the elderly is also much higher in residential homes for the elderly. The prevalence of depression in this study was found to be much higher than that of studies conducted in the community in Malaysia. The prevalence of depression has been shown to range around 8% in central Malaysia but much higher in the north where the prevalence of depression among the elderly in the community has been reported to be as high as 48.4% and 67% in a state run residential home in north Malaysia.

One of the most important factors determining the life satisfaction of the elderly is their level of functional independence. Independence in activities of daily living is important for the quality of life in the elderly. Maintaining an independent lifestyle in the elderly and the resulting quality of life is dependent on the ability of the person to carry out activities of daily living, including social activity. Physically impaired older people tend to become socially isolated, which may result in the exacerbation of mental health problems, particularly depression. Older adult with loss of functional autonomy are more susceptible to having symptoms of psychological distress. Studies show that 27 to 48% of older adults living in the community suffer from psychological distress symptoms. People who regain some of their functional anatomy experience a reduction in psychological distress symptoms. In this study being functionally dependent was a risk factor for depression. This is in concordance with studies conducted in Indonesia, Vietnam and Japan that found subjects with depression had significantly lower scores for ADL and Quality of Life than those without depression. Similarly another study conducted in north Malaysia among elderly in an old folks home also found higher rate of depression among those who were disabled.

LIMITATIONS OF STUDY

One of the limitations of our study is a relatively small sample size in comparison to other studies carried out elsewhere. This is because this study is conducted in a privately run institution which has a rather limited capacity to accommodate too many residents. In addition, being privately run, it is incapable of managing demented residents and hence it refers them to either government run institutions or the next of kin are told to take them back for nursing care. Thus, this explains the lower prevalence rate of cognitive impairment.

CONCLUSION AND RECOMMENDATIONS

Although the prevalence of cognitive impairment and depression was relatively lower in this study, mental health problems remain a major issue among residents in an old folk’s home. A systematic screening programme which can be used by the staffs of the institution should be implemented to identify residents who are depressed or cognitively impaired. Depression is often reversible with prompt and appropriate treatment. Early detection of dementia alerts patients, families and staffs to a condition.
that is progressive in nature and therefore allows time for financial and medical planning.

ACKNOWLEDGEMENT

This study had received a grant from Penang Medical College Malaysia. We would like to acknowledge the Dean of Penang Medical College for approving this study. We also gratefully acknowledge the cooperation of the manager and staff of the elderly care institution for their cooperation.

References

4. MacDonald AJD. ABC of Mental Health: Mental Health in Old Age. BMJ 1997; 315:413-17.
16. Teh EE, Hasanah CI. Validation of Malay version of Geriatric Depression Scale among elderly inpatients. Penang Hospital and School of Medical Sciences, Universiti Sains Malaysia. September 2004. Online http://www.priory.com/psych/MalayGDS.htm [access September 2007]
17. Mahoney FI, Barthel D. Function evaluation: the Barthel Index. Md State Med J 1965; 14:36-61
33. YI-LI C. Wu SC. Sung FC. Lifetime principal occupation and cognitive impairment among the elderly. Industrial Health 2002; 40:7-13
36. Diric A, Caulak L, Beyza AKD. Identifying the relationship among mental status, functional independence and cognitive impairment among residents of an elderly care home in Penang, Malaysia.
Author Information

C.R. Khaw
Penang Medical College

C.W. Teo
Penang Medical College

A.K. Rashid, MHSc
Associate Professor, Public Health Department