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## **Functional Disabilities and Its Associated Factors among Elderly Patients in Primary Care Clinics**

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# Functional Disabilities and Its Associated Factors among Elderly Patients in Primary Care Clinics

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## ABSTRACT

**Introduction:** Identification of risk factors associated with functional disability among elderly population is important in order to improve their quality of life.

**Objective:** To study the functional disability among elderly population in primary care clinics and its relation to their socio-demographic and health related risk factors.

**Material and Method:** A cross sectional study was conducted among elderly in three primary care clinics in Kuantan, Pahang Malaysia in assessing the functional disability and its associated risk factors. The respondents were selected through convenient sampling technique and interviewed them by using reconstructed standardized questionnaire which includes social-demographic background, medical illness, ability to perform basic activities of daily living (ADL), cognitive function and depression assessment.

**Results:** Out of 600 elderly that attended the clinics from 1<sup>st</sup> December 2006 to 31<sup>st</sup> January 2007, 182 (30.3%) respondents agreed to be enrolled in the study. The respondents were Malay (93.4%), females (54.4%) and married (71.4%) elderly. Most of them were living with their family (92.3%), received formal education (64.8%) and had no past history of recent hospital admission (81.3%). Their average monthly per capita income was RM 250. Most respondents (90.7%) suffered from chronic illness, 19.8% were functional dependent (according to Barthel index), 15.4% had cognitive impairment (according to ECAQ) and 17.0% had depression (according to GDS-14). The most common functional dependence was climbing stairs (45.6%). This study revealed that functional disabilities were found significantly associated with increasing age {OR: 1.139, 95%CI (1.043, 1.244)}, females {OR: 3.366, 95%CI (1.239, 9.141)}, living alone {OR: 8.039, 95% CI (2.002, 32.277)}, history of hospital admission {OR: 8.889, 95%CI (3.145, 25.127)} and depression {OR: 6.017, 95%CI (2.222, 16.298)}.

**Conclusion:** The elderly patients with increasing age, females, living alone, history of recent hospital admission and depression tend to have a high risk to suffer from functional disabilities.

## KEY WORDS

ADL (Activities of Daily Living), Barthel Index, ECAQ (Elderly Cognitive Assessment Questionnaire), GDS (Geriatric Depression Scale)

## INTRODUCTION

According to United Nations estimates, the population of the elderly 60 years and over in the world will reach 1.2 billion by 2025, the majority of whom will be in developing countries. The implementation of development and health programs along with the general improvement in the standard of living has also brought about remarkable

decline in mortality which also contributes to the ageing phenomenon<sup>1)</sup>. The population who are aged 60 and over in Malaysia is estimated at about 1.8 million now, and is projected to increase to 4 million by the year 2025<sup>2)</sup>. There are currently more than 20 developing countries in which life expectancy at birth is 72 years and above, which includes Malaysia<sup>3)</sup>.

Ageing is a normal progressive process, beginning at conception and ending in death. Ageing is not synonymous

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with diseases but diseases become more common as age progresses. Disabilities and frailty are common among the elderly in Malaysia and have been found to increase with age. This problem will have implications on future service and care requirements as the absolute numbers of disabled elderly will increase with the growing population of the elderly. Illnesses in the elderly tend to be chronic, the more common ones being cardiovascular disease, cerebrovascular disease, neurological problems, musculoskeletal problems, urinary and fecal incontinence, injuries from accidents, visual and hearing losses, dental deficits, psychosocial problems, depression, dementia and foot problems<sup>11</sup>.

It has been reported that physician visits among the elderly are known to increase with age. The prevalence of hospitalization was steadily increased in the elderly with majority of them (78.4%) were utilized the government hospital. Hospitalization is significantly correlated with chronic problems in the elderly such as medical illness and functional disabilities<sup>12</sup>. Current health care system has been developed to focus on short term care and hospitalization. Hence, the services available may not be effective in dealing with elderly having chronic diseases and disabilities that need long term care and hospitalization.

The ability of the elderly to live independently in the community is probably influenced by their functional capabilities or dependencies. Functional disability causing dependency and institutionalization, that strongly determines proper healthcare needs of older people.

The disability in elderly has been investigated in many studies using difficulty in performing activity daily living (ADL) tasks that are essential for self-care and mobility. There are two types of activity daily living that are used in most of the studies. They are basic activity daily living (BADL) and instrumental activity daily living (IADL). Both activities are important factors to predict the elderly to live independently in the community<sup>13</sup>.

## MATERIALS AND METHODS

This cross-sectional study was conducted in three primary care clinics in Kuantan, Pahang, Malaysia. The respondents were selected through convenient sampling technique from the 1<sup>st</sup> November 2006 to the 31<sup>st</sup> January 2007. They were interviewed by a team of two family physicians. Training was provided to standardize administration of the questionnaire. Two languages were used for the interviews (English or Bahasa Malaysia depending on respondents' preference).

The structured questionnaire consisted of two parts. First part consisted of socio-demographic factors and part two consisted of health problems. The socio-demographic factors included in this study were age, gender, ethnicity, marital status, educational level and income. Health problems were divided into physical and mental health. The physical health consisted of chronic illness and functional disability, whereas depression and cognitive impairment were selected to represent mental health problems. Selection of these health problems were made based on their common prevalence among the elderly population.

The chronic illnesses included in this study were Diabetes Mellitus, Hypertension, Ischemic Heart Disease, Stroke, Respiratory Disease (Bronchial Asthma or Chronic Obstructive Pulmonary Disease) and Rheumatism. Presence of chronic illness was made based on the respondent's self-

reports or medical record of illness that were diagnosed, under follow-up or treatment by medical practitioners in Malaysia.

The functional dependence status was assessed by using the Barthel's Index questionnaire. The questionnaire consists of 10 questions measuring basic Activities of Daily Living (ADL)<sup>14</sup>. Functional dependence in basic ADL implies that the elderly respondent needs assistance in one or more of their ADL<sup>15</sup>.

The Elderly Cognitive Assessment Questionnaire (ECAQ) was used to screen cognitive impairment among the respondents. The ECAQ consists of 10 items grouped under 3 categories: memory (3 items), orientation (6 items) and memory recall (1 item). Each item has a score of one mark for correct response. Respondents with total scores of 5 and below were identified as having cognitive impairment<sup>20</sup>.

The Geriatric Depression Scale (GDS) was used to screen for depression. The original GDS was created by Yesavage which consists of 30 questions<sup>21</sup> and the shorter 15 questions version (GDS-15) was later developed for easier use and better acceptability<sup>22</sup>. Both versions have been tested and used extensively to measure depression among the elderly. In this study, a shorter version of GDS-14 by Teh that consists of 14 questions was used. The item-9 ("Do you prefer to stay at home, rather than going out and doing new things?") from GDS-15 was omitted in this shorter version of GDS-14 that made it more suitable to use for screening of depression in the busy office clinic. This GDS-14 is validated and has in Malay and English version with satisfactory reliability and validity. Scores of more than 5 indicate presence of depression with 95.5% sensitivity and 84.4% specificity<sup>23</sup>.

The data were analyzed using the Statistical Package for Social Science for Windows, Version 14, 9 Chicago, Illinois). Continuous data were analyzed by Student t-test and ANOVA, while the categorical data were analyzed by Chi-square. Multivariate analysis-logistic regression test was used too. The tests were considered significant if  $p < 0.05$ .

## RESULTS

There were 182 patients interviewed during the study period. Their age ranged from 60 to 88 years. The median age of the respondents was 66 years with a standard deviation of 4.90.

Table 1 shows the socio-demographic characteristics of the respondents. There were 99 (54.4%) females respondents and 83 (45.6%) were males. Majority was Malays (93.4%) and others were from other ethnic groups such as Chinese (4.4%) and Indians (2.2%). Majority were married (71.4%) followed with widowed (25.3%) and single or divorced (3.3%). Most of them were living with their family (92.3%) and had formal education (64.8%). Their per capita income ranged from RM 83 to RM 1500 per month with median per capita income was RM 250 per month. Majority of the respondents (81.3%) had no past history of hospital admission within one year ago.

Table 2 shows the physical and mental health problems of the elderly. Majority of the respondents (90.7%) were diagnosed to have chronic illness. Most of them suffered from Hypertension (45.6%) and followed by Diabetes Mellitus (25.6%). Thirty six (19.8%) of respondents were functional dependence. Based on the ECAQ, there were twenty eight (15.4%) of respondents had scores of 5 or less and thus showed that 15.4% of them had cognitive impair-



**Table 1. Social-demographic profile (n = 182)**

Profile of the respondents	n	%
Age (years)		
Median (min-max)	66 (60-88)	IR: $\pm 6$
Sex		
Male	83	45.6
Female	99	54.4
Race		
Malay	170	93.4
Non-Malay	12	6.6
Marital Status		
Married	130	71.4
Widowed	46	25.3
Single/Divorced	6	3.3
Living		
Alone	14	7.7
Family	168	92.3
Education Level		
Not formal	64	35.2
Formal	118	64.8
Occupation		
Working	24	13.2
Not Working	158	86.8
Income per capita		
Median (min-max)	250 (83-1500)	IR: $\pm 227.1$
Admission to Hospital		
Yes	34	18.7
No	148	81.3

IR= Interquartile Range

**Table 3. Functional disabilities among the elderly (n = 182)**

Activities of Daily Living	n	%
1) Bowel control		
Incontinence or occasional incontinence	1	1.5
2) Bladder control		
Incontinence or occasional incontinence	8	11.8
3) Bathing		
Unable or needs help	2	2.9
4) Using the toilet		
Unable or needs help	2	2.9
5) Transfer to bed		
Unable or needs help	2	2.9
6) Mobility on level surfaces		
Immobile or using wheel chair or needs help	17	25.0
7) Climbing stairs		
Unable or needs help	31	45.6
8) Dressing		
Unable or needs help	2	2.9
9) Grooming		
Unable or needs help	1	1.5
10) Feeding		
Unable or needs help	2	2.9

**Table 2. Physical and Mental Health Problems of the elderly (n = 182)**

Health Problems	n	%
Chronic Illness		
Present	165	90.7
Absent	17	9.3
Functional Status		
Dependence	36	19.8
Normal	146	80.2
Cognitive Impairment		
Present	28	15.4
Absent	154	84.6
Depression		
Present	31	17.0
Absent	151	83.0
Depression		
Significant depression	17	54.8
Major depression	14	45.2

ment. The study found that 31 out of 182 respondents (17.0%) were found to have depression based on the GDS-14 after excluding ten with cognitive impairment. Out of this, 14 (7.7%) of them were found to have major depression.

Table 3 shows the functional disabilities among the elderly using Barthel Index. The most common problem identified using this index was problems in climbing stairs (45.6%). This was followed by 17 (25.0%) of the respondents who had problems with activity in mobility on level surface.

Table 4 shows the association between functional disabilities with others factors. In socio-demographic factors, functional disabilities were found significantly associated with age, gender, marital status, living arrangements and history of hospital admission.

In health-related problems, functional disabilities were found significantly associated with cognitive impairment and depression. There was no association in between chronic illness and functional disabilities. The study also found that the proportion of functional disabilities was higher in respondents among females (25.3%), single/divorced (33.3%), living alone (57.1%), history of recent hospital admission (44.1%), present of cognitive impairment (53.6%) and depression (54.8%).

Table 5 shows the multivariate analysis between sociodemographic and health-related factors with functional disabilities. The multiple logistic regression test reveals that five factors are associated with functional disabilities. The elderly with history of hospital admission have 8.8 times risk to suffer for functional disabilities {OR: 8.889, 95%CI (3.145, 25.127)}. It follows by those who stay alone at home {OR: 8.039, 95%CI (2.002, 32.277)}.

## DISCUSSION

### Socio-demographic Profile

The results of this study showed that there were a high-

**Table 4. Factors associated with functional disabilities among the respondents**

Factors	Functional Disabilities (n = 36) (%)	No Functional Disabilities (n = 146) (%)	p-value
Age*	68 ( $\pm 7$ )	65 ( $\pm 6$ )	0.002
Sex			
Male	11 (13.3)	72 (86.7)	0.043
Female	25 (25.3)	74 (74.7)	
Race			
Malay	33 (19.4)	137 (80.6)	0.707
Non-Malay	3 (25.0)	9 (75.0)	
Marital Status			
Married	19 (14.6)	111 (85.4)	0.017
Widowed	15 (32.6)	31 (67.4)	
Single/Divorced	2 (33.3)	4 (66.7)	
Living Arrangements			
Alone	8 (57.1)	6 (42.9)	0.001
Family	28 (16.7)	140 (83.3)	
Education Level			
No formal	15 (23.4)	49 (76.6)	0.362
Formal	21 (17.8)	97 (82.2)	
Occupation			
Working	1 (4.2)	23 (95.8)	0.051
Not Working	35 (22.2)	123 (77.8)	
Income per capital (RM)*	275 ( $\pm 203.1$ )	250 ( $\pm 227.1$ )	0.948
Admission to Hospital			
Yes	15 (44.1)	19 (55.9)	< 0.001
No	21 (14.2)	127 (85.8)	
Chronic Illness			
Present	34 (20.6)	131 (79.4)	0.531
Absent	2 (11.8)	15 (88.2)	
Cognitive Impairment			
Present	15 (53.6)	13 (46.4)	< 0.001
Absent	21 (13.6)	133 (86.4)	
Depression			
Present	17 (54.8)	14 (45.2)	< 0.001
Absent	19 (12.6)	132 (87.4)	

\* Median ( $\pm$  interquartile range)**Table 5. Multivariate Analysis between Sociodemographic and Health-Related with Functional Disabilities (n = 36)**

	B	S.E.	Wald	df	p	OR	95.0% Lower	C.I. OR Upper
Age	0.130	0.045	8.383	1.000	0.004	1.139	1.043	1.244
Females	1.214	0.510	5.670	1.000	0.017	3.366	1.239	9.141
Living Alone	2.084	0.709	8.637	1.000	0.003	8.039	2.002	32.277
Hospital admission	2.185	0.530	16.985	1.000	< 0.001	8.889	3.145	25.127
Depression	1.795	0.508	12.463	1.000	< 0.001	6.017	2.222	16.298



er percentage of respondents from the elderly Malay. This was due to the majority of elderly population in Kuantan is Malay (61.8%). The proportion of males and females were almost equal in this study. Malaysian population data indicates that the average life span of females (75.5 years) is longer than males (70.6 years) but this study found that the mean age of the females ( $66.5 \pm 5.5$ ) and males ( $66.6 \pm 4.1$ ) was almost equal. This study also showed a higher percentage of married respondents (71.4%), followed by widowed (25.3%). This finding corresponded to the previous studies in the community and health centre<sup>15,24</sup>. As expected, high proportion of the elderly live with their families (92.3%). This finding corresponded to the earlier studies among the elderly in the community<sup>7,24</sup>. Majority of the respondents were not working (86.8%). Hence, the median family monthly income per capita was RM 250 per month which is just above the poverty line level in Malaysia of RM 212 per month<sup>25</sup>.

### Chronic Illness

As expected that most of the respondents (90.7%) were diagnosed to have chronic illness. This is because majority of the respondents attended to the primary care clinic were sick or unhealthy elderly that came for acute treatment or continue medical follow-up. This finding is higher when compared to other studies, which found only 50-60% had chronic illness<sup>7,8,14</sup>.

The types of chronic illness in this study were Hypertension (45.6%) and followed by Diabetes Mellitus (25.6%) which is conformity to the study among the elderly in the rural community which reported high prevalence of chronic illness among the elderly namely Hypertension (22.0%), followed by Diabetes Mellitus (11.3%)<sup>7</sup>.

### Cognitive Impairment

The percentage of cognitive impairment was 15.4% among the respondents. This finding is lower than the earlier study in a rural community, which reported 22.4% of the elderly in a rural community, had cognitive impairment<sup>7</sup>. This finding is higher if compared to other study in the urban community which showed the results of 8.3%<sup>5,8</sup>.

### Depression

The percentage of depression among the elderly in this study was 17.0%. This result is almost consistent with the study in primary care clinic that had 18% of the respondents suffering from depression<sup>15</sup>. As expected, the results of this study is higher than other studies in the community which found only 3.4% to 7.6% of the elderly suffering from depression<sup>7,13</sup>. A higher underlying morbidity such as chronic illness and history of hospital admission among the elderly attending primary care clinics resulted in higher percentage of depression in this study. Furthermore, higher unemployment and low monthly family income in this study may also contributed to a higher percentage of depression.

### Functional Disabilities

In this study, thirty six (19.8%) of the elderly were

dependent in at least one daily activity (ADL). This result is in the range of other studies in the community that showed a prevalence of functional dependence ranging between 6.6% to 23.3%<sup>5-9,13,14</sup>. The most common of functional disabilities in this study was climbing stairs (45.6%) and followed by mobility on level surface (25%). This finding inconformity to the study in Singapore and Shanghai, China that showed the most common functional disabilities of the elderly was urinary incontinence<sup>5,7</sup>.

Functional disabilities is consistently reported as being associated with aging, females, low educational level, lack of exercise, chronic diseases, impaired cognition<sup>11</sup> and depression<sup>12</sup>. In this study, it was found that variables age, marital status, living arrangements, history of hospitalization, cognitive impairment and depression were significantly differentiated with functional disabilities.

This study also found that increasing age, females, living alone, history of hospitalization and depression as significant risk factors for functional disabilities. The elderly with history of hospitalization had the highest risk (8.8 times) to develop functional disabilities. This was followed by those who living alone, depressive, females and increasing age.

## CONCLUSION

The health problems identified in this study were chronic illness, cognitive impairment, depression and functional decline. The prevalence of functional disabilities in this study was 19.8% and was significantly associated with increasing age, females, living alone, history of hospitalization and depression.

The elderly who be admitted to the hospital within a year and living alone should be given more attention by the health workers and community. Both factors were shown to give more than eight time risks each for the elderly to suffer for functional disabilities. Hence, preventive plans and appropriate management should be instituted to address these problems.

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