

**VALIDATION OF MALAY VERSION SHORT-FORM
GERIATRIC DEPRESSION SCALE AND STUDY OF
PREVALENCE OF MAJOR DEPRESSION AND ITS
ASSOCIATED PSYCHOSOCIAL FACTORS AMONG
ELDERLY INPATIENTS**

AT UNIVERSITI SAINS MALAYSIA HOSPITAL

By



DR. TEH EWE EOW

**Dissertation Submitted In
Partial Fulfillment Of The
Requirement For The Degree Of
Master Of Medicine
(Psychiatry)**

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BAHAGIAN PENYELIDIKAN PUSAT PENGAJIAN SAINS PERUBATAN
Dr. Teh Ewe Eow
USM Hospital, USMKK
Tarikh : 19/8/05

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ABBREVIATIONS

DSM	:	Diagnostic and Statistical Manual of Mental Disorders
GDS	:	Geriatric Depression Scale
HAM-D	:	Hamilton Rating Scale for Depression
HUSM	:	Universiti Sains Malaysia Hospital
MADRS	:	Montgomery-Asberg Depression Rating Scale
M-GDS	:	Malay version Geriatric Depression Scale
MMSE	:	Mini-Mental State Examination
ROC	:	Receiver operating characteristic
SD	:	Standard deviation
SSRI	:	Selective serotonin reuptake inhibitor
WHOQOL-BREF	:	World Health Organization Quality of Life Assessment – Brief Version

ABSTRACT

VALIDATION OF MALAY VERSION SHORT-FORM GERIATRIC DEPRESSION SCALE AND STUDY OF PREVALENCE OF MAJOR DEPRESSION AND ITS ASSOCIATED PSYCHOSOCIAL FACTORS AMONG ELDERLY INPATIENTS AT UNIVERSITI SAINS MALAYSIA HOSPITAL

Background: Depression is prevalent among the elderly physically ill inpatients and has important clinical implications, but often under recognized and under treated. There is no previous Malaysian data on the prevalence of major depression among the elderly inpatients.

Objectives: This study aimed to validate the Malay version of the short form Geriatric Depression Scale (GDS) in order to determine the prevalence of major depression and its associated psychosocial risk factors among the elderly inpatients hospitalized for general medical condition.

Methods: The study consisted of 2 stages. First, the validation of the Malay version-GDS; followed by a cross sectional prevalence study, participated by 271 elderly inpatients. Data were collected using a self-administered questionnaire, the validated Malay version-GDS and WHOQOL-BREF. Major depression was defined as score above the optimum cut-off point on Malay version-GDS determined at the validation study.

Results: The validation study showed the item-9 from Malay version-GDS-15 had no discriminatory value in differentiating cases and non-cases and poorly correlated with the total corrected item score. By omitting the item-9, the newly formed scale, M-GDS-14, has satisfactory reliability and validity as a screening scale for depression among physically ill elderly inpatients. At the cut off point of 7/8, the M-GDS-14 had 100% sensitivity and 92.0% specificity in detecting major depression.

The overall prevalence for major depression was 37.3%, 25.9% for male and 45.8% for female. Under multivariable analysis, the female to male odds ratio for major depression was 2.2 ($p = 0.03$). Those depended on working as the primary source of personal income, were at significant higher risk than pension group for major depression ($OR = 7.8$). The self-rating of relatively having enough money to meet needs, satisfactory personal relationship, adequate accessibility to information needed and opportunity for leisure activities were all significant protective factors against major depression.

Conclusion: The prevalence yielded in this study was relatively high. Clinician should be aware of this highly comorbid condition along with patients' physical illness. Good social resources play important role in preventing major depression in the elderly inpatients.

Key Words: Geriatric Depression Scale, prevalence, major depression, elderly, inpatient, physical illness.

ABSTRAK

PENGESAHAN SKALA KEMURUNGAN GERIATRIK SINGKAT VERSI MELAYU DAN KAJIAN PREVALENS KEMURUNGAN MAJOR SERTA FAKTOR-FAKTOR PSIKOSOSIAL YANG BERKAITAN DI KALANGAN PESAKIT DALAM YANG TUA DI HOSPITAL UNIVERSITI SAINS MALAYSIA

Latar Belakang: Kemurungan adalah lazim di kalangan pesakit dalam yang tua dan mempunyai implikasi klinikal yang penting, namun sering tidak dikesan dan dirawat dengan sewajarnya. Data Malaysia terdahulu tentang prevalens kemurungan major di kalangan pesakit dalam wad yang tua tidak kedapatan.

Objektif: Kajian ini bertujuan untuk mengesahkan Skala Kemurungan Geriatrik (GDS) agar diguna dalam penentuan prevalens kemurungan major serta faktor-faktor risiko psikososial yang berkaitan dengannya di kalangan pesakit tua yang masuk hospital kerana penyakit fizikal.

Metodologi: Kajian ini terdiri daripada dua peringkat. Pertama, pengesahan GDS singkat versi Melayu, diikuti oleh kajian prevalens keratan lintang yang disertai seramai 271 pesakit dalam yang tua. Data dikumpul melalui pengisian sendiri borang soal selidik, GDS dan WHOQOL-BREF versi Melayu yang sudah dikesahkan. Kemurungan major didefinisi sebagai pencatatan mata yang melebihi titik potong optimum pada GDS versi Melayu yang ditentukan semasa kajian pengesahan skala.

Keputusan: Kajian pengesahan menunjukkan soalan ke-9 pada GDS-15 versi Melayu tidak ada kuasa dalam membezakan kes-kes kemurungan daripada bukan kes, serta berkorelasi lemah dengan skor total skala selepas pembetulan. Dengan meninggalkan soalan ke-9, skala baru yang terbentuk, iaitu M-GDS-14, mempunyai reliabiliti dan kesahan yang memuaskan sebagai skala untuk menyaring kemurungan di kalangan pesakit tua dalam wad yang berpenyakit fizikal. Pada titik potong 7/8, M-GDS-14 mempunyai kepekaan 100% dan kekhususan 92.0% dalam mengesan kemurungan major.

Prevalens kemurungan major keseluruhan adalah 37.3%, 25.9% untuk lelaki dan 45.8% untuk perempuan. Dengan analisa multivariabel, nisbah ganjil perempuan kepada lelaki untuk kemurungan major adalah 2.2 ($p = 0.03$). Golongan yang bergantung kepada pekerjaan untuk sumber utama pendapatan diri mempunyai risiko yang lebih tinggi yang signifikan daripada yang menerima pencen (OR = 7.8). Mempunyai wang yang cukup untuk memenuhi keperluan, berpuas hati dengan perhubungan peribadi, mendapat peluang untuk aktiviti riadah serta berpuas hati dengan pengangkutan secara relatif mengikut pengkadaran diri, semuanya merupakan faktor-faktor pelindung terhadap kemurungan major.

Kesimpulan: Prevalens yang didapati dalam kajian ini adalah tinggi berbanding dengan yang lain. Pakar perubatan perlu sedar akan kadar penyakit kemurungan yang tinggi di kalangan pesakit di samping menghadapi penyakit fizikal. Sumber sosial yang baik memainkan peranan penting dalam mencegah kemurungan major di kalangan pesakit dalam wad yang tua.

CHAPTER 1 INTRODUCTION

1.1 Population Aging in Malaysia

As a developing country, the process of development in Malaysia has brought about socioeconomic as well as demographic transformation. The elderly population aged 60 years and above is projected to increase by 211% from 1990 to 2020, that is from 1.05 million to 3.26 million, with the proportion aged increase from 5.7% to 9.8%; while the population aged 70 is projected to increase from 0.4 million to 1.2 million across 1990 to 2020 (Karim 1997). In year 2000, the elderly population (aged 60 years and above) had reached 1.45 million or 6.2% of the total population (Kementerian Kesihatan Malaysia 2000).

The population aging has great implication on the health. The elderly are, on the whole less healthy than the non-elderly. With the increasing age, the elderly have greater exposure to health risk factors and lessening adaptability (Ebrahim 1995). They are at higher risk of morbidity and disabilities, particularly from the non-communicable, chronic medical problem (e.g. cardiovascular diseases, diabetes mellitus, cancer). They are also vulnerable to injuries from the environmental hazard. Among the elderly, increasing age is also associated with higher use of health services and greater demand for specialized services (Davis 1985).

Apart from or along with physical illness, depression is highly prevalent among elderly people (Beekman et al 1999). There is also an increase on depressive symptoms with age among the elderly (Newman & Engel 1991).

Elderly have rich experiences and skills, have made their contributions in many ways and that still possess the potential to continue to do so to their family, society and nation. Acknowledging this, The National Policy For The Elderly was launched to enhance their well-being for the rest of their lives. The policy also encourages research studies to obtain information for systemic planning towards the well being of the elderly (Ministry of National Unity and Social Development).

1.2 Symptomatology of Depression in The Elderly

Controversy remains whether depression in late life differ symptomatically from those at younger age. Earlier studies suggested agitation (Winokur et al 1973), somatic symptoms (Nielson & Williams 1980, Katon 1982) and hypochondriacal worries (Gurland 1976, Pichot & Pull 1981) were common in elderly than younger depressed patients, thus often masked the depression. The believe that depression in late life presents differently from depression at other stages of the life cycle, lead to the view that criteria for diagnosing depression designed for use in a younger adult population may be inappropriate for elderly subjects.

The studies later, however, did not conform to these earlier findings (Blazer et al 1987, Berkman et al 1980, Ross & Mirowsky 1984). Mesetti et al (1989) found no excess of agitation, somatization and hypochondriasis in old age onset depression than the younger depressed patient. Stage et al (2001) also did not find any clinical significant differences in symptomatology between younger and elderly depressed patients and concluded that the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association 1994) concept of Major Depression and The ICD-10 Classification of Mental and Behavioural Disorders (ICD-10; World Health Organization 1992) criteria for depression can be used without modification for age.

1.3 Spectrum of Depression in The Elderly

The term "depression" used in different context or literatures may indicate different level of severity across the spectrum of depression.

1.3.1 Non-Clinical Significant Depressive Symptoms

Depressive symptoms are not uncommon among the elderly, but not all reach the clinical significant level. Although the depressed elderly often complain of somatic symptoms such as sleep disturbance, anorexia and weight loss, these symptoms are less specific for depression among the elderly.

1.3.2 Minor Depression

In epidemiological studies, minor depression is often defined as all depressive syndromes deemed clinically significant, but not fulfilling criteria for major depression (Blazer 1994). It is sometimes known as clinically significant non-major depression (Lavretsky 2002), and includes a variety of often ill-defined depressive syndrome, but does not limited to the DSM-IV (APA 1997) research criteria for minor depressive disorder only.

1.3.3 Major Depression

Major depression denotes the clinical depressive syndromes that fulfill rigorous diagnostic criteria, such as DSM-IV diagnostic criteria for major depressive episode.

1.4 Clinical Implications of Depression in The Elderly

Depression among the elderly is associated with higher prevalence and risk of disability (Alexopoulos et al 1996, Penninx et al 1998). There is also increase evidence that depression is associated with poorer outcome in several specific diseases, such as cardiovascular diseases (Lesperance et al 2000, Fush et al 2001) and stroke (Paolucci et al 2001).

The utility of health services and thus the health care cost is also increased with presence of depression among the physically ill elderly (Koenig et al 1989, Unutzer et al 1997, Bulla et al 2001, Fischer et al 2002, Finkelstein et al 2003).

Finally, depression in elderly patients increase the mortality, even after adjustment for sociodemographic characteristics, health status, health behaviours, functional and cognitive impairment (Covinsky 1999, Penninx et al 1999).

1.5 Prevalence of Major Depression among Elderly Inpatients

The prevalence of depression is higher in medically ill hospitalized patients than community population. The prevalence rates were usually 2-3 folds higher in studies included all form of clinically significant depression than those limited only to major depression.

The studies elsewhere found the prevalence of major depression in elderly medical inpatients ranged from 5.9 – 45% (Kok et al 1995, Kitchell et al 1982). This wide variation of prevalence rate narrows down to 5.9 – 25%, when only studies with a structured and validated diagnostic interview are included (Kok et al 1995, Jackson & Baldwin 1993). Although the reported prevalence of major depression in elderly medical inpatients varied, several studies have reached a consensus of 15% (Katona 1994).

There is no previous study on the prevalence of major depression among the physically ill elderly inpatients in Malaysia.

1.6 The Under-Recognition of The Condition

Despite the high prevalence and serious clinical implications, major depression among the geriatric inpatients mostly goes on unrecognized and untreated, even though it is a potentially treatable condition. There was only 8.7% of depressed patient identified by house staff in one study (Rapp et al 1988).

In another study, the documentation rate of depressive symptoms by house staff was only 20%, which increased to only 27% after they had been informed of the possibility of major depression (Koenig 1988a).

The use of screening scale such as Geriatric Depression Scale (GDS) has been demonstrated a better detection rate of depression than medical and nursing staffs in some studies (Rapp et al 1988, Jackson & Baldwin 1993).

1.7 Geriatric Depression Scale

1.7.1 GDS-30

GDS is one of the most widely used scales for depression screening among the elderly population. The scale is designed for self-administration and the original version (GDS-30) consisted of 30 questions in the form of yes / no (Yesavage et al 1983). The yes /no question format has the advantage of less confusing to the elderly and ease to administer.

The scale was developed with the recognition that depressive symptoms in elderly patients require an instrument designed to discriminate the pattern of depressive symptoms from the general characteristics of the elderly population. During the development of the scale, it was found that the somatic symptoms such as sleep disturbance, anorexia, weight loss, cardiac or gastrointestinal symptoms, failed to differentiate depressed and non-depressed elderly; thus these symptoms are not assessed by the GDS.

During the original validation study, GDS-30 was found to have better internal consistency than two other pre-existing depression rating scales, namely Hamilton Rating Scale for Depression (HAM-D) and Zung Self-rating Depression Scale (SDS). The test-retest reliability involved 20 subjects, at one week apart, with a correlation of 0.85 (Yesavage et al 1983). At the cut off of 11, GDS-30 had 84% sensitivity and 95% specificity whereas a cut-off of 14 decreased the sensitivity rate to 80% but increased the

specificity rate to 100% (Brink et al 1982). The GDS-30 has been widely validated across different clinical setting, culture and language. (Koenig et al 1988b, Norris et al 1987, Ganguli et al 1999)

1.7.2 GDS-15

The GDS-30 had been commented to be too lengthy for the elderly especially in acute medically ill condition. The shorter 15 questions version (GDS-15) was later developed for easier used and better acceptability. It takes an average of 5–7 minutes to complete and is composed of the 15 items from the original GDS that had the highest correlation with depressive symptoms (Sheikh & Yesavage 1986). The GDS-15 was shown to have high correlation ($r = 0.89$, $p < 0.001$) with the original 30 items version (Leshner & Berryhill 1994).

The GDS-15 has also been validated across different clinical setting, culture and language (Leshner & Berryhill 1994, D'Ath et al 1994, Abas et al 1998, Liu et al 1998, Fountoulakis et al 1999, de Craen 2003).

1.8 Risk Factors of Geriatric Depression

1.8.1 Psychosocial Factors

(a) Demographic Factors

Epidemiological studies consistently reported a female preponderance in depression rates (Weissman & Klerman 1977, Weissman et al 1993, Wilhelm et al 1997, Cole & Dendukuri 2003). However, the gender difference in depression rate tends to narrow down towards older age (Jorm 1987). The greater social adversity faced by female and age effect has been suggested as possible confounding for this difference.

Sonnenberg et al (2000) examined the gender differences in late-life (aged 55 year and above) depression using stratified sampling for age and gender; the finding was the prevalence of depression in female was almost twice as high as in male. Controlling for age and competing risk factors, the relative risk for female reduced from 1.8 to 1.3; thus the confounding effects of age and exposure risk only partially explained the effect of sex on depression.

In Sonnenberg et al (2000), they included subjects aged from 55 years and above. The relative risk of female to male for depression within the age group of 55-59 years in this study was surprisingly low (0.71). When only considering those age 60 years and above, the relative risk for female became 2.07.

The association between age and depression has been controversial. There are studies found depressive symptoms increases with age (Newman & Engel 1991, Schoevers et al 2000), but others found no difference (Green 1992, Turvey et al 1999) or fewer (Eaton & Kessler 1981, Livingston et al 2000). Although within the older population, there does seem to be an increase in depressive symptoms with age, this should be attributed to age-related changes in risk factors, and not to aging itself (Beckman 1999).

Findings regarding major depression appear to be more consistent that the prevalence decreases with age (Beckman 1999, Blazer 1997), despite one would expect the associated physical frailty and social adversity often encounter at the older old age predispose them to the greater vulnerability of major depression. Koenig et al (1991), in a study of older (age > 70) and younger men admitted to the medical wards of a veterans' hospital, found a similar overall prevalence of depression, using DSM-III-R criteria, in the two groups. Major depression, was however, commoner in younger patients and minor depression in the older group.

Most studies did not find being unmarried as risk factor for depression in the elderly, but bereavement was found to be significant risk for depression in the old age (Cole & Dendukuri 2003).

The lower education had been implicated as risk factor for depression among the old age in some studies (Harlow et al 1991, Roberts et al 2000), but others reported no significant association (Schoevers et al 2000, Livingston et al 2000).

(b) Socioeconomic Status and Social Support

Lower income or borderline living expenses were also associated with higher risk of depression in the elderly (McIlorney & Mor 1988, Woo et al 1994).

Poor social support is a recognized associated risk of depression. Living alone, lack of confiding relationship and care provider when ill have all been found to be significant risk of depression for the elderly (Kennedy et al 1989, Woo et al 1994, Beckman et al 1995).

Subjects with lower socio-economic status are exposed to more life-events and have less social support in general. After controlling for life events and social support, Murphy (1982) found the association between socio-economic status was no longer significant.

1.8.2 Physical Illness

Several specific medical conditions have been associated with higher risk of depression. The review by Koenig and Studenski (1988) found that 30-65% of individuals

were depressed in the year following a stroke. Patients with heart attacks were also at particular high risk of depression (Glassman 2002) that prophylactic antidepressant treatment had been advocated. The association of depression with many other medical conditions such as cancer, Parkinson's disease, endocrine and metabolic disorders were also described (Katona 1994).

Nevertheless, studies on the relationship of physical illness with depression were consistently shown that that the general aspects of physical health have stronger associations with depression than specific disease categories (Kinzie et al 1986, Kennedy et al 1989, Beckman et al 1997).

On controlling other risk factors, Beckman et al (1997) found that physical health was related to only minor depression, but not major depression among the aged population. Katona (1994) in his review also concluded that risk factors for depression within the physically ill elderly appear similar to those for depression in old age as a whole.

1.9 Interrelations of Geriatric Depression and Its Risk Factors

The interrelations between geriatric depression with aging, physical illness and its psychosocial risk factors are summarized in the Figure 1.

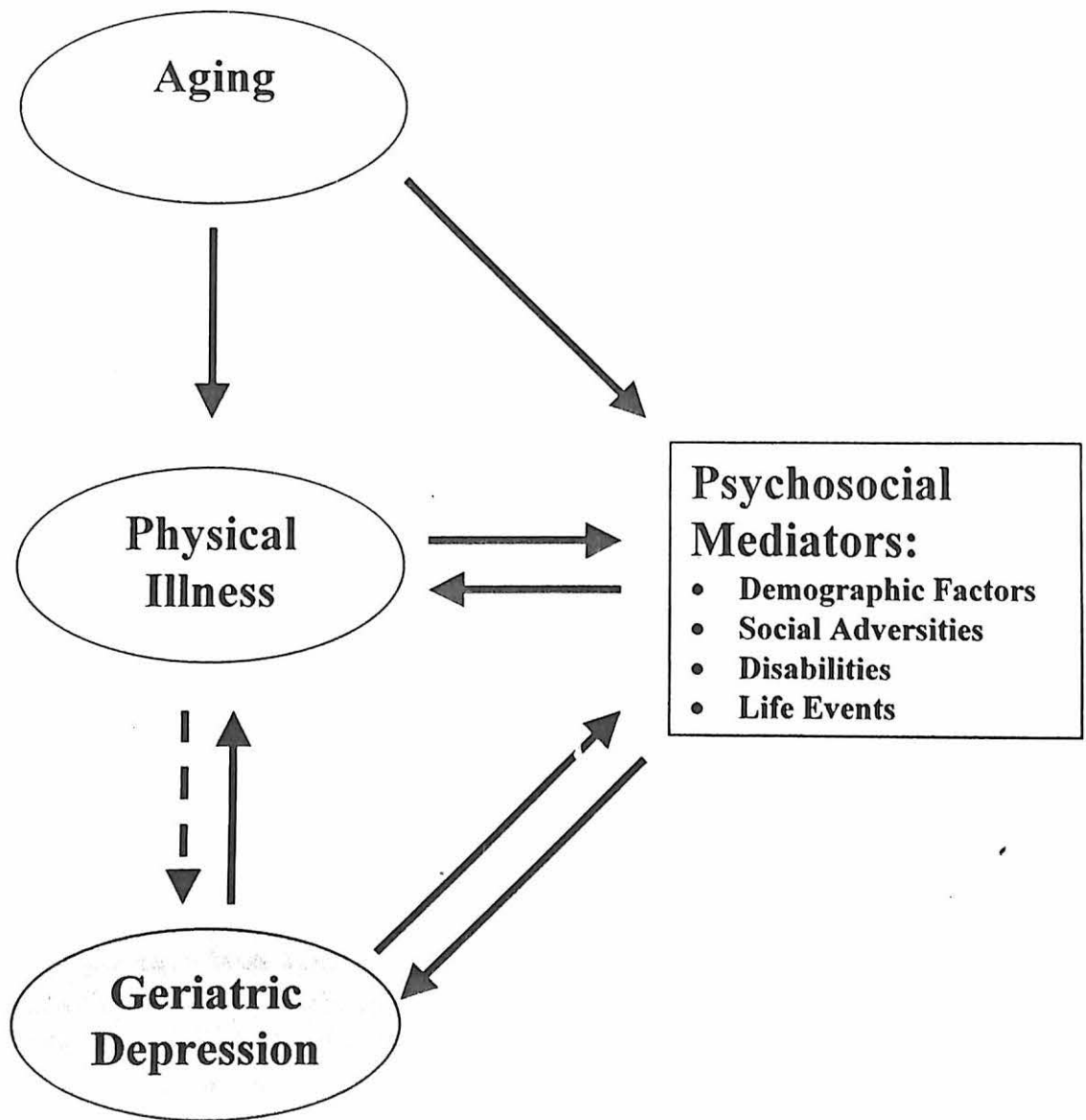


Figure 1.1: Interrelations of aging, physical illness and depression in elderly

1.10 Scope of The Study

The scope of this dissertation would focus on:

1. Major depression -- the most severe form across the spectrum of depression;
2. The elderly -- aged 60 years and above (follow the definition of The National Policy of The Elderly);
3. Inpatients -- during the state of having acute or serious physical illness.

CHAPTER 2 OBJECTIVES

2.1 General Objective

Validation of the Malay version of the short form GDS, the GDS-15 in order to determine the prevalence of major depression and its associated psychosocial risk factors among the elderly inpatients hospitalized for general medical condition at Universiti Sains Malaysia Hospital (HUSM) between February to June 2003.

2.2 Specific Objectives

1. To validate the GDS-15 in elderly inpatients hospitalized for general medical condition.
2. To determine the optimum cut off point of the GDS in detecting major depression.
3. To examine whether male and female patients respond differently to the GDS.
4. To determine the prevalence of major depression among the elderly inpatients hospitalized for general medical condition at HUSM.
5. To determine possible associations if any, between psychosocial factors and major depression among the elderly inpatients hospitalized for general medical condition.

a) Demographic Characteristics

- Gender
- Age
- Ethnic group
- Marital status
- Educational level
- Working status
- Admission ward

b) Socioeconomic Status

- Personal income
 - Amount of monthly personal income
 - Primary source of personal income
- Financial adequacy

c) Social Support

- Living accompany condition
 - Whether living alone
 - Number of people lived with
- Confiding relationship
- Care giver if sick
- Personal relationship
 - Personal relationship in general

- Friends' support
- Spouse support

d) Family Role Played

- Involvement in family decision
- Involvement in caring for grandchildren

e) Environmental Social Needs

- Satisfaction with conditions of living place
- Satisfaction with transport
- Accessibility to information needed
- Opportunity for leisure activities

6. To determine the association between depressive symptoms and quality of life in the elderly inpatients hospitalized for general medical condition.

CHAPTER 3 METHODOLOGY (I) : VALIDATION STUDY OF GDS

3.1 Introduction

The lack of suitable psychometric instruments is a major problem faced by local researchers in their researches as well as clinicians in their clinical practices. Most of the instruments developed in the West may not be suitable for local use because of language barriers and cultural differences. These instruments needed to be validated before they could be used locally as proper measures.

The shorter form of GDS with 15 items was chosen for validation because it is relatively simple, short and takes only 5-7 minutes to be self-completed by respondents, making it acceptable and practical for use in the medically ill geriatric patients. Furthermore, many studies had consistently reported GDS-15 possessed good correlations with the original longer version, GDS-30. It was also validated cross culturally in studies elsewhere.

3.2 Translation of GDS

The GDS-30 and GDS-15 was translated into Malay language (denoted as M-GDS-30, M-GDS-15 below respectively) using translation and back translation method. Two schoolteachers who are bilingual in both English and Malay translated the GDS-15 and GDS-30 from English into Malay. Two medical doctors who are also bilingual translated

the Malay version back into English. Both scales, the original and the back-translated English versions, were compared to determine the accuracy of the translation, with advice from The Centre for Languages and Translation of Universiti Sains Malaysia (“Pusat Bahasa dan Terjemahan Universiti Sains Malaysia”).

3.3 Pretest and Revision of Scales

The M-GDS-15 and M-GDS-30 were tested on 20 elderly patients in the medical wards in IIUSM. Each patient was assessed for possible misunderstanding or confusion of items in the scales.

3.4 Instruments

3.4.1 Mini-Mental State Examination

The Mini-Mental State Examination (MMSE) is probably the most widely used measure of cognitive function. It was developed to differentiate organic from functional disorders, and could be used as a quantitative measure of cognitive impairment in an attempt to measure change, but was not for diagnosis sense (Folstein et al 1975). It takes 5-10 minutes to be completed by a trained rater.

The MMSE has a maximum score of 30 points, with different domains assessed:

- Orientation to time and place (10 points)
- Registration of three words (3 points)
- Attention and calculation (5 points)
- Recall of three words (3 points)
- Language (8 points)
- Visual construction (1 point)

All the questions must be asked and usually done in sequence. The cut-off point to indicate cognitive impairment is generally between 23-25 (Tombaugh & McIntyre 1992).

3.4.2 Montgomery-Asberg Depression Rating Scale

Montgomery-Asberg Depression Rating Scale (MADRS; Montgomery & Asberg 1979) is a rating scale for the assessment of depression, which was drawn from a larger scale, the Comprehensive Psychopathological Rating Scale (CPRS). The MADRS consists of 10 items that are all core symptoms of depression:

- Apparent sadness
- Reported sadness
- Inner tension
- Reduced sleep

- Reduced appetite
- Concentration difficulties
- Lassitude
- Inability to feel
- Pessimistic thoughts
- Suicidal thoughts

The rating is based on a clinical interview and it takes around 20 minutes to be completed by trained raters. The first item is the rater's observation of the patients, the rest are based upon patient report. Items of the MADRS are rated on a 0 to 6 scale (0 = no abnormality, 6 = severe).

The MADRS has the advantage over the more commonly utilized HAM-D that it does not focus predominantly on the somatic symptoms of depression, thus could be suitably used in the elderly patients.

3.4.3 M-GDS-15 and M-GDS-30

Description of GDS-30 and GDS-15 as in section 1.7.1 and 1.7.2

3.5 Study sample

Subjects were 60 inpatients aged 60 years and above from medical, surgical and orthopedic department at IIUSM.

Exclusion criteria were:

1. Significant cognitive impairment (MMSE score $< 24/30$),
2. History or presence of severe mental illness, including bipolar mood disorder, schizophrenia and other psychotic disorder,
3. Inability to understand Malay language,
4. Patients who are too ill to participate,
5. Refusal to participate.

Written informed consent was obtained from eligible subjects after explained the nature of the study.

3.6 Procedure

Single researcher, who is trained in psychiatric interview and examination, interviewed all the subjects individually. Subjects' cognitive function was assessed using MMSE and only subjects with scores 24/30 and above were recruited. Subjects were assigned clinical diagnosis as major depression, minor depression or no depression.

Diagnosis of major depression was made if subjects' clinical features met for DSM-IV criteria of major depressive episode. Diagnosis of minor depression was given if subjects were clinically significant depressed but did not meet the DSM-IV criteria of major depressive episode; this included conditions met for DSM-IV diagnostic criteria of dysthymic disorder, research criteria for minor depressive disorder, recurrent brief depressive disorder. Major depression and minor depression were grouped together as all clinically significant depression. The researcher also rated the subjects depressive symptoms by using MADRS, based on the findings during the same interview.

All the 60 subjects were given self-administered translated M-GDS-15 after the clinical interview. Thus, the interviewer was blind to the score of GDS when the clinical diagnosis was made. For those subjects who were unable to complete the self-rating scale without assistance, the researcher read the questions orally, elicited answers from the subject and recorded his or her response. Thirty of the subjects also completed the M-GDS-30. Fifty subjects were given M-GDS-15 for second administration 2 to 3 days after the first test.

3.7 Data analysis

Data entry and analysis was done using SPSS software version 9.0 (Norusis 1999).

3.7.1 Reliability

The internal consistency of the M-GDS-15 was assessed using corrected item-total correlation and Cronbach's alpha coefficient. Correlation between the total scores of first and second administration of M-GDS-15 was computed for test-retest reliability.

3.7.2 Validity

The clinical diagnosis made was the gold standard in classifying subjects into no depression, minor depression or major depression. Individual item validity was tested against the clinical diagnoses using Chi square test (or Fisher's exact Test). To test the hypothesis that the total score of the scale as a valid indices of depression, Kruskal-Wallis test was used in which the classification variable served as a between-subjects factor while the subjects' total scores on the M-GDS-15 served as the dependent measure.

The correlation between the score on the M-GDS-15 and MADRS was used to indicate concurrent validity. The correlation between total scores on the M-GDS-15 and M-GDS-30 was determined to check M-GDS-15 adequacy to substitute the full scale of 30 items.

The optimum M-GDS-15 cut-off score for major depression (versus non-major depression) and clinically significant depression (versus no depression) would be determined by the Receiver Operating Characteristic (ROC) curves separately. The