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UNIVERSITI SAINS MALAYSIA
DITERIMA
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Pusat Pengajian Sains Perubatan

THE EPIDEMIOLOGY OF PHYSICAL DISABILITY AMONG ELDERLY IN KOTA BHARU, KELANTAN

UNIVERSITI SAINS MALAYSIA
DITERIMA PADA
15 MAY 2005
Perpustakaan Perubatan

by

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Department of Community Medicine
School of Medical Science,
Universiti Sains Malaysia,
Kubang Kerian, Kelantan.

2004

Semua laporan kemajuan dan laporan akhir yang dikemukakan kepada Bahagian Penyelidikan dan Pembangunan perlu terlebih dahulu disampaikan untuk penelitian dan perakuan Jawatankuasa Penyelidikan di Pusat Pengajian.

USM R&D/JP-04

LAPORAN AKHIR PROJEK PENYELIDIKAN R&D JANGKA PENDEK

A. MAKLUMAT AM

Tajuk Projek: The Epidemiology of physical disability among elderly in Kota Bharu, Kelantan"

Tajuk Program: Geran Jangka Pendek No : 304 / PPSP / 6131258.

Tarikh Mula: 1 Januari 2003

Nama Penyelidik Utama: Prof. Madya Abd. Aziz Al- Safi Ismail
(*berserta No. K/P*)

Nama Penyelidik Lain: Dr. Latifah Dahalan (690224-08-6458)

(*berserta No. K/P*) Dr. Hamzah Ag. Mat

B. PENCAPAIAN PROJEK:

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[✓] Penemuan asli/peningkatan pengetahuan

Prevalence of physical disability among elderly were 10.7% for ADLs and 34.8% for IADLs. The significant associated factors for physical disability were older age, lower income, marital status, obesity, high diastolic blood pressure and high cholesterol level.

BAHAGIAN PENYELIDIKAN
PUSAT PENGAJIAN SAINS PERUBATAN

SALINAN :

[ ] Bhg. Penyelidikan, PPSP
[✓] Perpustakaan Perubatan, USMKK
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T/Tangan : ..... Tarikh : 14/5/05

☐ **Rekaan atau perkembangan produk baru,**
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(1) N/A

(2) _____

(3) _____

☐ **Mengembangkan proses atau teknik baru,**
(*Sila beri penjelasan/makluman agar mudah dikomputerkan*)

(1) N/A

(2) _____

(3) _____

☐ **Memperbaiki/meningkatkan produk/proses/teknik yang <u>sedia ada</u>**
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(1) _____

(2) _____

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C. PEMINDAHAN TEKNOLOGI

☐ Berjaya memindahkan teknologi. NA

Nama Klien: (1) _____
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(2) _____
(3) _____

☐ Berpotensi untuk pemindahan teknologi. NA
(Nyatakan jenis klien yang mungkin berminat)

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D. KOMERSIALISASI

☐ Berjaya dikomersialkan. NA

Nama Klien: (1) _____

(2) _____

(3) _____

☐ Berpotensi untuk dikomersialkan.
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_____

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E. **PERKHIDMATAN PERUNDINGAN BERBANGKIT DARIPADA PROJEK**
(*Klien dan jenis perundingan*)

(1) _____

(2) _____

F. **PATEN/SIJIL INOVASI UTILITI**
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(1) _____

(2) _____

G. **PENERBITAN HASIL DARIPADA PROJEK**

(i) **LAPORAN/KERTAS PERSIDANGAN ATAU SEMINAR**

(1) **ORAL PRESENTATION**

8 th National Conference on Medical Science
" Medicine in The Genomic Era"
8-9 May 2003
Health Campus, Universiti Sains Malaysia
Kota Bharu, Kelantan.

RISK FACTORS OF PHYSICAL DISABILITY AMONG ELDERLY IN KOTA BHARU, KELANTAN.

(2) **ORAL PRESENTATION**

Third Kelantan Health Conference
" Challenges for Healthier Future"
19-20 August 2003
School of Dental Science,
Health Campus, Universiti Sains Malaysia
Kota Bharu, Kelantan.

ASSESSMENT OF SOCIO-ECONOMIC, FUNCTIONAL AND MEDICAL PROBLEMS AMONG ELDERLY IN KOTA BHARU, KELANTAN.

(ii) **PENERBITAN SAINTIFIK**

(1) Dalam Proses

(2) _____

H. **HUBUNGAN DENGAN PENYELIDIK LAIN**
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(1) _____

(2) _____

I. **SUMBANGAN KEWANGAN DARI PIHAK LUAR**
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(1) _____

(2) _____

(3) _____

J. **PELAJAR IJAZAH LANJUTAN**
(*Nyatakan jumlah yang telah dilatih di dalam bidang berkaitan dan sama ada diperingkat sarjana atau Ph.D).*

	Nama Pelajar
Sarjana	**Dr. Latifah Dahalan**
Ph.D	_____
	_____
	_____

K. **MAKLUMAT LAIN YANG BERKAITAN**

30/5/04

Tarikh

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16150 Kubang Kerian,
KELANTAN, MALAYSIA.

TANDATANGAN PENGERUSI
JAWATANKUASA PENYELIDIKAN
PUSAT PENGAJIAN

Fn. My doc geran j/pendek

ORAL PRESENTATION

8 th National Conference on Medical Science
" Medicine in The Genomic Era"
8-9 May 2003
Health Campus, Universiti Sains Malaysia
Kota Bharu, Kelantan.

RISK FACTORS OF PHYSICAL DISABILITY AMONG ELDERLY IN KOTA BHARU, KELANTAN.

**Latifah D., *Abdul Aziz Al-Safi.,& [1]Hamzah A.M*

A cross-sectional study was conducted to determine the risk factors of physical disability among elderly, aged 60 years and above. A total of 250 participants were taken randomly under 3 health clinics under Kota Bharu operational areas by using multistage sampling. Researchers visited their home, explained regarding the study and asked for informed consent if they were agreed. Guided- questionnaire were administered by the research assistant and the subjects were asked to go to clinics or community centre on the appointed date for physical examination and blood taking for fasting blood sugar and total cholesterol. For patients who were unable to go to the community centre, physical examination and blood taking were done at their house. Physical disability is measured by two indicators that are activity of daily living (ADL) and instrumental's activity of daily living (IADL). ADL is comprise bathing, dressing, going to toilet, transferring from bed or chair, continence, and feeding. Whereas IADL encompass the following domestic function : using the telephone, using transportation, shopping, cooking, house-keeping, taking medication and budgeting. The IADL methods offer indicators of " applied " problem that extend the disability theme of ADL scales to include some elements of handicap concept. Physical disability is defined as the inability to accomplish one or more ADL or IADL. Separate multiple logistic regression is used to determine the

who have visual impairment were 63.3% and 37% have hearing impairment. About 15% have fasting blood sugar more than 7.8 mmol/l, 68.8% have total cholesterol level more than 5.2 mmol/l, 47% have diastolic hypertension, and 57.4% have systolic hypertension. When using activities of daily living (ADLs) as an indicator for physical disabilities, the prevalence of physical disabilities was 10.7%, whereas 34.8% for instrumental activities of daily living (IADLs).

Conclusion : Older population is varied in personal background, lifestyle behavior, medical conditions and physical disabilities. This diversity should be acknowledged in social policy as well as government on the prevention of chronic diseases which are either preventable or modifiable with healthy lifestyle habits as well as with some correction measures.

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ASSESSMENT OF SOCIO-ECONOMIC, FUNCTIONAL AND MEDICAL PROBLEMS AMONG ELDERLY IN KOTA BHARU, KELANTAN.

*Latifah D., *Abdul Aziz Al-Safi.,& [1]Hamzah A.M

* *Department of Community Medicine, School of Medical Science, Universiti Sains Malaysia, Kubang Kerian, Kelantan.*
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Objective : In Malaysia, the decline in fertility and mortality as well as improvement in life expectancy were said to be responsible for the aging of the population by the year 2020. Our life expectancy at birth has increased from 56 years in the 1950s to 70.4 years for males and 75.3 years for females in the year 2002. The purpose of this study is to present a broad overview of current knowledge of socio-demographic characteristics and health conditions among elderly population age 60 and over.

Methods :This is a cross-sectional study which involved a total of 270 participants of elderly, aged 60 years and above under 3 health clinics of Kota Bharu operational areas. Guided- questionnaire were administered by the researcher and the subjects were asked to

Results: Sixty-six percent of elderly were women and majority of them were muslim (go to clinics or community centre on the appointed date for physical examination and 98.5%). Nearly 62% of them never have any formal education and about 62% were blood taking for fasting blood sugar and total cholesterol.
unemployed. Regarding the income, more than 50% dependent on their child and about 66% of them have income less than RM 200. The prevalence of elderly who smoked, physically active, and overweight/obese were 17%, 39.6% and 30.8 respectively. Elderly

who have visual impairment were 63.3% and 37% have hearing impairment. About 15% have fasting blood sugar more than 7.8 mmol/l, 68.8% have total cholesterol level more than 5.2 mmol/l, 47% have diastolic hypertension, and 57.4% have systolic hypertension. When using activities of daily living (ADLs) as an indicator for physical disabilities, the prevalence of physical disabilities was 10.7%, whereas 34.8% for instrumental activities of daily living (IADLs).

Conclusion : Older population is varied in personal background, lifestyle behavior, medical conditions and physical disabilities. This diversity should be acknowledged in social policy as well as government on the prevention of chronic diseases which are either preventable or modifiable with healthy lifestyle habits as well as with some correction measures.

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2004

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ABSTRACT

THE EPIDEMIOLOGY OF PHYSICAL DISABILITY AMONG ELDERLY IN KOTA BHARU, KELANTAN

Globally, the decline in fertility and mortality as well as improvement in life expectancy were said to be responsible for the aging population by the year 2020. In Malaysia, the elderly population was 1.2 million or 5.9% of the 20 million total population in the country in 1995. This number was projected to increase to 11.3% by the year 2020. Elderly population are prone to get physical disability as well as chronic medical illnesses. This is a cross-sectional study to determine the prevalence of physical disability and its associated risk factors among elderly, aged 60 years and above. A total of 270 participants were taken randomly under 3 health clinics under Kota Bharu operational areas by using multistage sampling. Guided- questionnaire were administered and the subjects were asked to go to clinics or community centre on the appointed date for physical examination and blood taking for fasting blood sugar and total cholesterol. Physical disability was measured by activities of daily living (ADLs) and instrumental's activities of daily living (IADLs). ADLs is comprise of bathing, dressing, going to toilet, transferring from bed or chair, continence, and feeding. Whereas IADLs encompass the following domestic function : using the telephone, using transportation, shopping, cooking, house-keeping, taking medication and budgeting. The IADLs methods offer indicators of " applied " problem that extend the disability theme of ADLs scales to include some elements of handicap concept. Physical disability was defined as the inability to accomplish one or more ADLs or IADLs.

Separate multiple logistic regression was used to determine the risk factors for both physical disabilities. The prevalence of physical disabilities in ADLs and IADLs were 10.7% (95% CI: 7, 14) and 34.8% (95% CI: 29, 41) respectively. Significant risk factors of ADLs were age (OR=2.669, 95%CI:1.107, 6.643), hearing impairment (OR= 2.539, 95%CI: 1.034,6.233), diastolic blood pressure (OR= 3.803, 95%CI:1.249, 11.578), and total cholesterol (OR= 1.535, 95%CI: 1.071, 2.200).Whereas for IADL were age (OR=2.391, 95%CI: 1.185,4.827), income (OR= 0.219, 95%CI:0.078, 0.615),diastolic blood pressure (OR=2.023, 95%CI:1.038,3.941), marital status (OR=2.378, 95%CI:1.227,4.609) and obesity (OR=4.679,95%CI:1.544, 14.182). There was a strong significant association between ADLs and IADLs (OR=9.012, 95%CI:3.400, 23.887). The prevalence of physical disability for ADLs and IADLs were 10.7% and 34.8% respectively and it was similar with others studies. These findings also suggested that certain socio-demographic characteristics (i.e age, income & marital status), life-style behavior (obesity) and medical illnesses (hearing impairment, total blood cholesterol and high diastolic blood pressure) were significant risk factors of physical disability in elderly. Physical disability in ADLs was a strong predictor for physical disability in IADL. The majority of predictors of physical disability that were identified by this study are potentially subject to modification either by treatment, life-style change or special device. Public health efforts to reduce prevalence of all these factors in both sexes should continue.

ABSTRAK

Pengurangan kadar kelahiran dan kematian di samping peningkatan jangkahayat menyumbang kepada pertambahan penduduk wargatua pada tahun 2020 di dunia. Di Malaysia, bilangan penduduk wargatua adalah 1.2 juta atau 5.9% daripada 20 juta jumlah bilangan penduduk pada tahun 1995 dan dijangkakan bertambah kepada 11.3% pada tahun 2020. Wargatua berkencenderungan mengalami ketidakupayaan fizikal dan mengidap penyakit-penyakit kronik. Kajian irisan lintang ini dijalankan bertujuan untuk menentukan kadar prevalen ketidakupayaan fizikal dan mengenalpasti faktor-faktor risikonya di kalangan wargatua, umur 60 tahun dan ke atas. Seramai 270 orang peserta yang tinggal di kawasan operasi 3 buah klinik kesihatan di daerah Kota Bharu telah dipilih secara rawak dengan menggunakan kaedah pensampelan pelbagai peringkat. Para peserta ditemuramah dengan menggunakan borang kajiselidik secara panduan. Mereka dikehendaki berpuasa sekurang-kurangnya 10 jam dan datang ke klinik kesihatan atau dewan masyarakat pada tarikh yang telah ditetapkan untuk pemeriksaan kesihatan dan pengambilan darah bagi ujian kolesterol dan paras glukos. Ketidakupayaan fizikal ditentukan dengan menggunakan Indeks Aktiviti Asas Kehidupan Harian (ADLs) dan indeks Instrumental Aktiviti Asas Kehidupan Harian (IADLs). ADLs adalah berkaitan dengan asas penjagaan diri yang meliputi mandi, memakai pakaian, menggunakan tandas, pergerakan dan pengawalan buang airbesar/ air kecil. IADLs pula berkaitan dengan keupayaan diri yang lebih kompleks iaitu penggunaan telefon, perjalanan, membeli barang keperluan, penyediaan makanan, kerja rumah, pengambilan ubat-ubatan dan pengurusan kewangan. Definisi ketidakupayaan fizikal ialah ketidakupayaan melakukan satu atau lebih aktiviti-aktiviti di

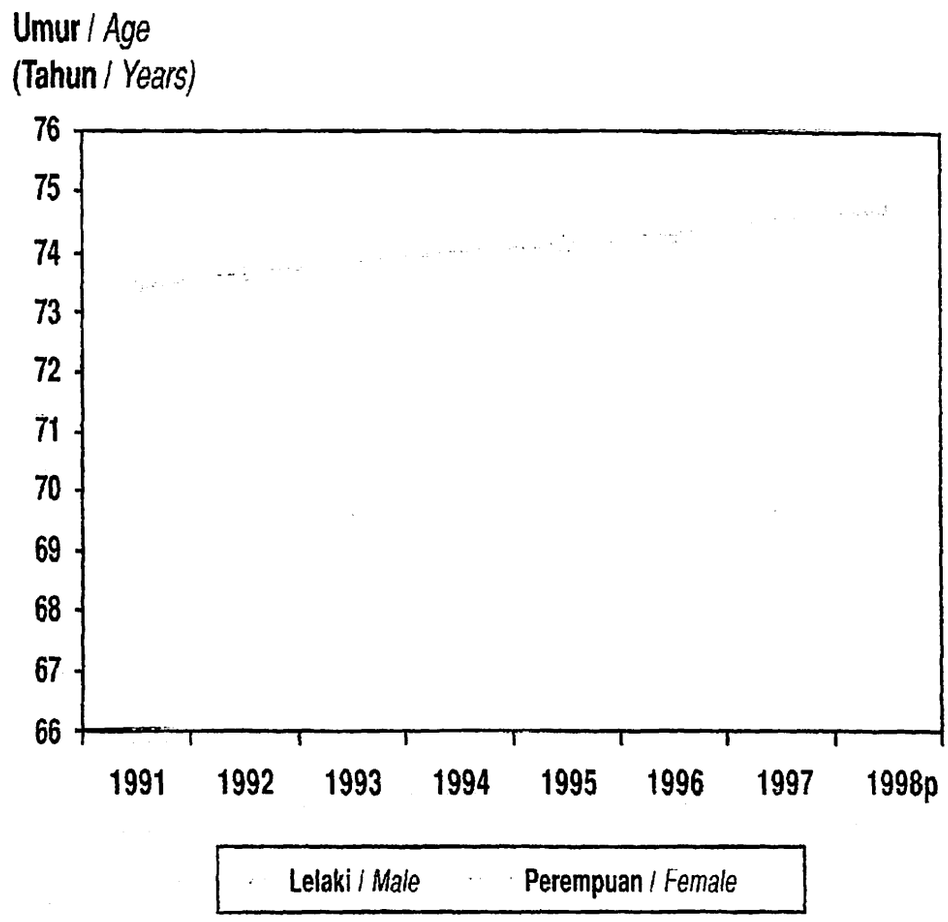
atas. Analisis dilakukan secara berasingan bagi kedua-kedua indikator tersebut. Kadar prevalen bagi ketidakupayaan fizikal untuk ADLs dan IADLs ialah masing-masing 10.7% (95% CI: 7, 14) dan 34.8% (95% CI: 29, 41). Faktor-faktor risiko yang bermakna bagi ketidakupayaan fizikal untuk ADLs ialah umur (OR=2.669, 95%CI:1.107, 6.643), kekurangan pendengaran (OR= 2.539, 95%CI: 1.034,6.233), tekanan darah diastolik (OR= 3.803, 95%CI:1.249, 11.578), dan paras kolesterol (OR= 1.535, 95%CI: 1.071, 2.200). Manakala bagi ketidakupayaan fizikal untuk IADLs ialah umur (OR=,2.391, 95%CI: 1.185,4.827), pendapatan (OR= 0.219, 95%CI:0.078, 0.615), tekanan darah diastolik (OR=2.023, 95%CI:1.038,3.941), status perkahwina (OR=2.378, 95%CI:1.227,4.609) dan kegemukan (OR=4.679,95%CI:1.544, 14.182). Hubungan antara kedua-dua indikator ini adalah sangat bermakna. Ketidakupayaan fizikal di dalam aktiviti ADLs memberi risiko untuk mendapat ketidakupayaan fizikal di dalam aktiviti IADLs (OR=9.012, 95%CI:3.400, 23.887). Kesimpulannya, kadar prevalen bagi ketidakupayaan fizikal untuk ADLs dan IADLs adalah masing-masing 10.7% dan 34.8% . Hasil kajian juga mendapati faktor-faktor sosiodemografi (umur, status perkahwinan dan pendapatan), gaya hidup (kegemukan) dan tahap kesihatan (tekanan darah diastolik, kekurangan pendengaran dan paras kolesterol) mempunyai hubungan yang bermakna dengan ketidakupayaan fizikal ini di kalangan wargatua. Manakala ketidakupayaan fizikal di dalam aktiviti ADLs memberi risiko yang tinggi untuk mendapat ketidakupayaan fizikal di dalam aktiviti IADLs. Kebanyakan faktor-faktor risiko ini boleh diubah samada melalui rawatan, pengubahsuaian cara hidup dan penggunaan alat. Usaha-usaha bagi mengurangkan kadar prevalen bagi faktor-faktor risiko ini hendaklah diteruskan dan mestilah konsisten.

CHAPTER ONE

1. INTRODUCTION AND LITERATURE REVIEW

1.1. Definition and introduction of elderly

Ageing can be defined as a biological, sociological, economic and chronological phenomenon. In the Policy for the Elderly in Malaysia , elderly was defined chronologically as those over 60 years of age, adopting the criteria set at the World Assembly on Aging in Vienna in 1982 (Ministry of National Unity and Social Development, 1996). Many researchers used 65 years and above as cut off point for elderly, but in some younger age group of 60 years and above was used (Chen, 1987). Some researcher further divide the elderly into young elderly (age 60 - 74) and old elderly (75 and above) (Mutowo, 1996). A country is said to be aging when at least 7% of the population are elderly (United Nations, 1993). In Malaysia, the decline in fertility and mortality as well as improvement in life expectancy were said to be responsible for the aging of the population by the year 2020. Female have higher life expectancy at birth compared with men as shown on Figure 1.1. Our life expectancy at birth has increased from 56 years in the 1950s to 70.4 years for males and 75.3 years for females in the year 2002 (Laporan Banci,2000) .



Source : Vital Statistics Time Series, Malaysia 1963- 1998.Department of Statistics Malaysia

Figure 1.1 : Life expectancy at birth by sex, Malaysia, 1991-1998

1.2. Epidemiology

1.2.1. Worldwide

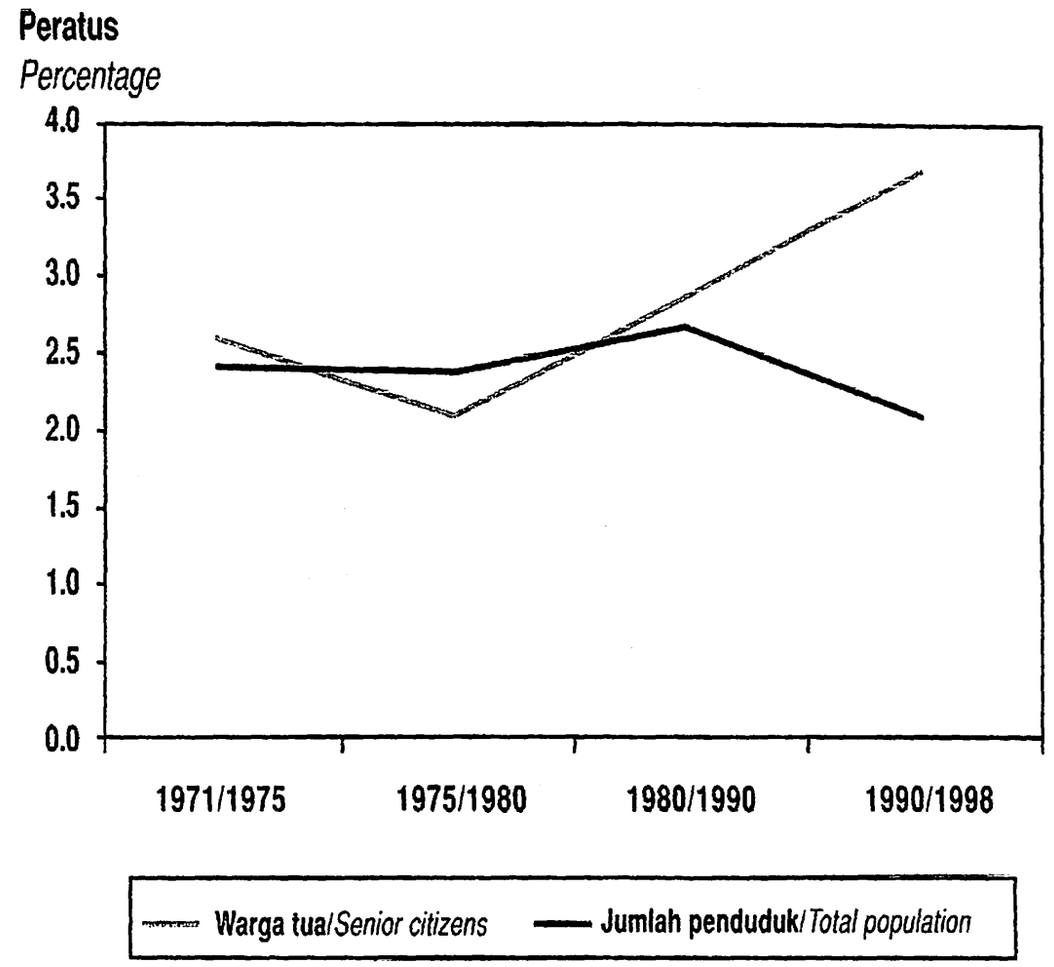
The world's population in the year 2001 was 6.1 billion is likely to grow by another 3 billion in the next half-century, according to the UN projection. Most of the population growth will occur in the less developed countries of Africa and Asia, in contrast populations in a few industrialized countries will remain stable or even shrink. Globally, the number of people 60 years or older increasing from 606 million in the year 2001 to nearly 2 billion by 2050. In more developed regions, people 60 or over constitute about 20% of the population, and it is estimated they will account for 33% in 50 years time (Hagmann, 2001). The population of elderly is expected to rise 75% compared to less than 50% increase in the world's population as a whole by 2020 (Kalache,1999).

1.2.2. Malaysia

In Malaysia, the elderly population was estimated to be 1.2 million or 5.9% of the 20 million total population in 1995. This number is projected to increase to 6.6% by the year 2000 and 11.3% by the year 2020 (Malaysia Health Report 2000). Figure 1.2.1 (a) showed the average annual growth rate for elderly compared with total population in Malaysia. In 1971/1975, average annual growth rate for elderly, 60 years and above was 2.6% and was increased to 3.7% in the year 1990/1998. Whereas average annual growth

rate for total population showed reducing in trend in which it was 2.4% in the year 1971/1975 and 2.1% in the year 1990/1998.

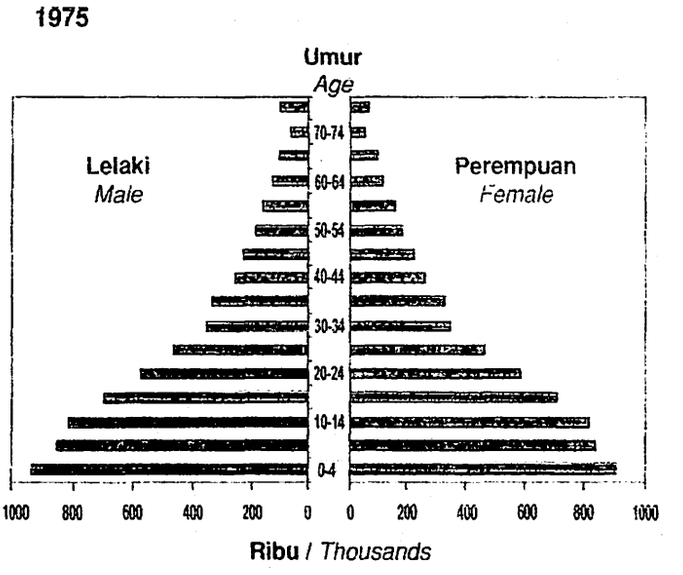
The health of populations aged 60 and above, is far from homogenous. Frailty and dependency increase more rapidly after 70. Not only are populations growing older, the old themselves are living longer. Thus, ageing in Malaysia will see the proportion of population aged 70 increasing from 2.21% in 1990 to 3.5% in 2020. Disproportion between the number of males to females also increases with ageing as shown in the Figure 1.2.1(b). Projected increases between 1990 and 2020 in the number of aged persons in Malaysia are 1.01 million for males and 1.20 for females. The sex ratio (number of men per 100 women) will decrease from 90.1 in 1990 to 85.8 in 2020. Thus there will be an increasing predominance of women among the aged population in Malaysia (Karim, 1997).



Source : Vital Statistics Time Series, Malaysia 1963- 1998.Department of Statistics Malaysia

Figure 1.2.1(a) : Average annual growth rate for senior citizens (60+ years) and total population, Malaysia, 1971-1998.

CHART 2a: POPULATION DISTRIBUTION BY AGE AND SEX, MALAYSIA, 1975 AND 1998



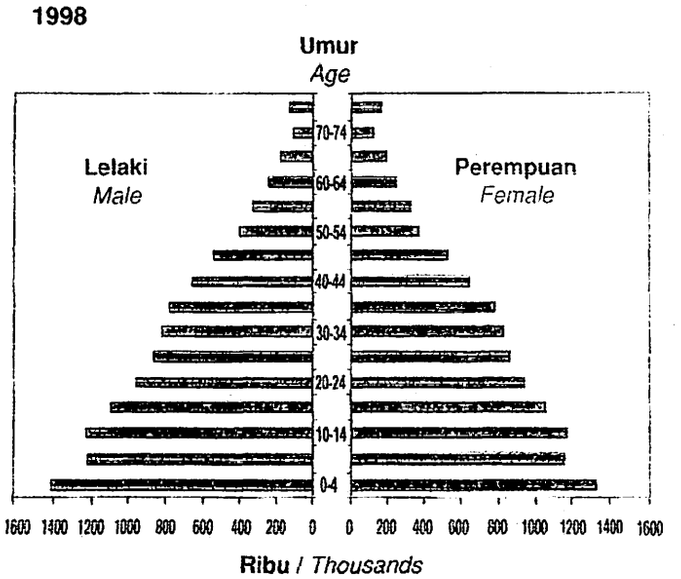


Figure 1.2.1(b) : Population distribution by age and sex, Malaysia, 1975 and 1998.

1.3. Biological mechanisms of aging

The nature of the mechanisms involved in the aging process is actually not known. This is not only because good work in this area has been limited but also because the problem itself is intrinsically difficult. Another confounding problem in understanding aging is the fact that there is a vast spectrum of aging changes. The process of aging is probably multi-factorial in its regulation; however, it is difficult to tell which changes are primary to an aging-regulated event and which are secondary. There is currently no adequate theory of biological aging. The facts that all these theories have their strength and weaknesses. Basically these theories can be grouped into 2 classes according to their fundamental conceptual basis.

i. Stochastic Theories

In this formulation, aging is caused by the accumulation of "insults" from the environment which eventually reach a level incompatible with life.

a. Somatic Mutation Theory of Aging

The theory states that mutations (genetic damage), presumably resulting from background radiation will accumulate and eventually produce functional failure and, ultimately, death.

b. Error Theory

This theory proposes that although random errors in protein synthesis may occur, the error-containing protein in molecule will be turned over and the next copy will be error-free. However, if the error-containing protein is one which is involved in

the synthesis of the genetic material or in the process synthesizing machinery, then this molecule could cause further errors so that the number of error-containing proteins would expand to result in an "error crisis," which would be incompatible with proper function and life.

c. Related Theory

This theory is based on cross-linking in macromolecules such as collagen and elastin. Since cross-linking increases with age, the vital physiological processes which occur in a bed of matrix molecules will not be able to proceed effectively.

ii. Development-Genetic Theories.

The group of theories consider the process of aging to be part of a continuum with development, genetically controlled and programmed.

a. Neuro-endocrine Theory

This theory regards functional decrements in neurons and their associated hormones as central to the aging process. It proposes that the hypothalamic, pituitary, adrenal axis is the master timekeeper for the organism and the primary regulator of the aging process. Functional changes in this system are accompanied by functional decrements throughout the organism.

b. Theory of Intrinsic Mutagenesis

This theory suggests that each species is endowed with specific genetic constitution which regulates the fidelity of the genetic material and its replication. Each set of regulators could have diminished capacity thus allowing an increase in mutational events.

c. Immunological Theory of Aging

This theory proposed that the functional capacity of the immune system declines with age, as seen in reduced T-cell function and in reduced resistance to infectious disease. Another point is that the fidelity of the immune system declines with age, as evidenced by the striking age-associated increase in autoimmune disease.

d. Free radicals Theory

The theory states that most aging changes are due to damage caused by free radicals (atoms or molecules with an unpaired electron). Usually free radicals are destroyed by protective enzyme such as superoxide dismutase. However some free radicals escape destruction and cause damage which accumulates in important biological structures, then interferes with function and ultimately causes death.

(Cristofalo, 1990, Lewis,1996, and Sandmire, 1999)

1.4. Physical Disability

1.4.1. Definition and introduction

The expansion of the nation's older population in an era of limited resources for health care has appropriately focused attention on maximizing and preserving the health status of older adults. In recognition of the pivotal role that declining functional status plays in maintaining dependence, suppose our target is to have increasing years of healthy life and reducing the proportion of older adults with limitations in activities of daily living (LaCroix *et al*,1993). The dramatic shift in the age structure of Malaysian society is receiving increasing public and professional attention. Concern regarding rising health care costs accompany this shift in age structure. The elderly are major consumers of health care, having twice as many hospital stays per capita, lasting twice as long, as those younger. The elderly also require a wider array of health care settings than do younger age groups. These services include long-term care facilities, rehabilitation facilities, outpatient clinics, respite centers, home care, and hospices. The onset of physical disability accounts for a large portion of this demand for health care services among the elderly. Preventing or delaying disability is a major goal of most plans designed to control health care costs and is the most promising approach to reducing the functional consequences of disease and aging (Miller, 1996).

Variation in individual patterns of change in physical function is not uniform. Many persons maintain good function to advanced ages, and many persons who experiences disability recover from it, even among the older age group. This evidence of recovery is especially important because it indicates the potential to reverse disability even in the oldest age group (Beckett *et al*, 1996).

The ***International classification of impairments, disabilities and handicaps*** by the World Health Organization (WHO), defines impairment, disability and handicap as follows.

Impairment

Any temporary or permanent loss or abnormality of a body structure or function, whether physiological or psychological. An impairment is a disturbance affecting functions that are essentially mental (memory, consciousness) or sensory, internal organs, the head, the trunk or the limbs.

Disability

A restriction or inability to perform an activity in the manner or within the range considered normal for a human being, mostly resulting from impairment.

Handicap

This is the result of an impairment or disability that limits or prevents the fulfillment of one or several roles regarded as normal, depending on age, sex and social and cultural factors. They are known as survival strategies and include the capacities to position oneself within one's environment and respond to environmental stimuli, to conduct an independent existence in a normal fashion in a normal fashion according to sex, age and culture, to maintain social relationship, and to pursue a socioeconomic activity and

preserve self-sufficiency. Handicap thus results from a health condition and is linked to factors such as individual resources and the collective environment. In this classification, " disability" represents the consequences of impairment of an organ or system on the functioning of the individual in terms of limitation of functions or restriction of activities. Barbotte *et al* (2001), however comment regarding this classification by WHO, which have several weakness points. First, impairment, disability and handicap are considered as distinct events in time, whereas in practice it is sometimes difficult to determine clearly at what point one condition leads to another. Second, no account is taken of the impact of environmental factors in the broad sense; only personal experience of ill-health plays a part in establishing the existence of an impairment, disability or handicap. Third, the concept of disability is used in a number of classifications but the variety of ways in which it is defined has led to confusion about its meaning.

Attention for physical disability is growing because of several developments. First, it is increasingly recognized that health problems should not only be viewed in terms of diseases and clinical parameters but also in terms of its consequences for daily life. Physical disabilities and the need for health services are important consequences, especially for chronic diseases for which full recovery is often not possible, such consequences should be kept to a minimum. Chronic condition are the main causes of physical disability. Second, physical disabilities can express the combined effect of several diseases, which is important since comorbidity is very common, specially among elderly and number of elderly are growing in our society both in size and proportion (Picavet &Hoeymans, 2002). Knowledge of chronic diseases or conditions in and of

itself, however does not directly inform us about level of disability. Direct information is still needed on the nature and extent of disability in the elderly population.

1.4.2. Pathophysiology

Disability is generally considered a good indicator of overall health status in older population. It is thought to arise from the cumulative damage of the chronic disease processes that affect humans throughout life and that become manifest in older age. Disability in the elderly is a gradual process , and people devote attention to restoring the capabilities they once enjoyed. Their experiences and adaptations to other troubles over a lifetime serve as resources when activity accommodations needs to be made. (Verbrugge & Jette 1994). Fried *et al* (1999) hypothesized the etiology of disability being structured like an "iceberg". Above the waterline is dependence, the visible effect is disability. Below the waterline is impairment and preclinical disability, both not readily visible because independence is maintained. Preclinical disability is a state of disability characterized by development of early functional limitations before they are either clinically apparent or interfere with effective functioning. They also proposed that preclinical disability occurs in two possible ways. In the first, tasks are performed without modification but general activity level gradually declines. The individual is unaware of the impact on function until he or she crosses a threshold of severity. In the second way, specific tasks are affected but can still be completed because the individual changes the way the tasks are performed. This can occur through compensatory strategies or lowering standards, i.e., accepting slower or less frequent performance of a task without perceiving having difficulty with the task.

A conceptual scheme for disability is important in order to understand the process involved. " The Disablement Process" proposed by Verbrugge & Jette (1994) describes how chronic and acute conditions affect functioning in specific body systems, fundamental physical and mental actions, and activities of daily life. It also explained how the personal and environmental factors can speed or slow disablement; namely, predisposing risk factors that propel dysfunction, interventions inserted to avoid, retard or reverse it, and exacerbators that hasten it. " Disablement" refers to impacts that chronic and acute conditions have on the functioning of specific body systems and on people's abilities to act in necessary, usual, expected and personally desired ways in their society. The process of disablement progress from pathology to impairments to functional limitations to disability. Functional limitations are restrictions in performing fundamental physical (and mental) actions used in daily life, for example overall mobility, discrete motions, and strengths. Disabilities are defined as inabilities in performing activities in any domain of life in a usual manner. The distinction between functional limitations and disabilities is the context : functional limitations refer to individual capability without reference to situational requirements, while disability refers to the expression of a functional limitation in a social context. Referring to this process, performances measures reflect functional limitations, where self-reported functional status refers more to disabilities. It may indicate that the disablement process is a dynamic process, in which not all impairments lead to functional limitations, and that not all functional limitations lead to disabilities. In addition, not only functional limitations lead to disabilities, but disabilities also influence functional limitations(Hoeymans *et al*, 1996) .

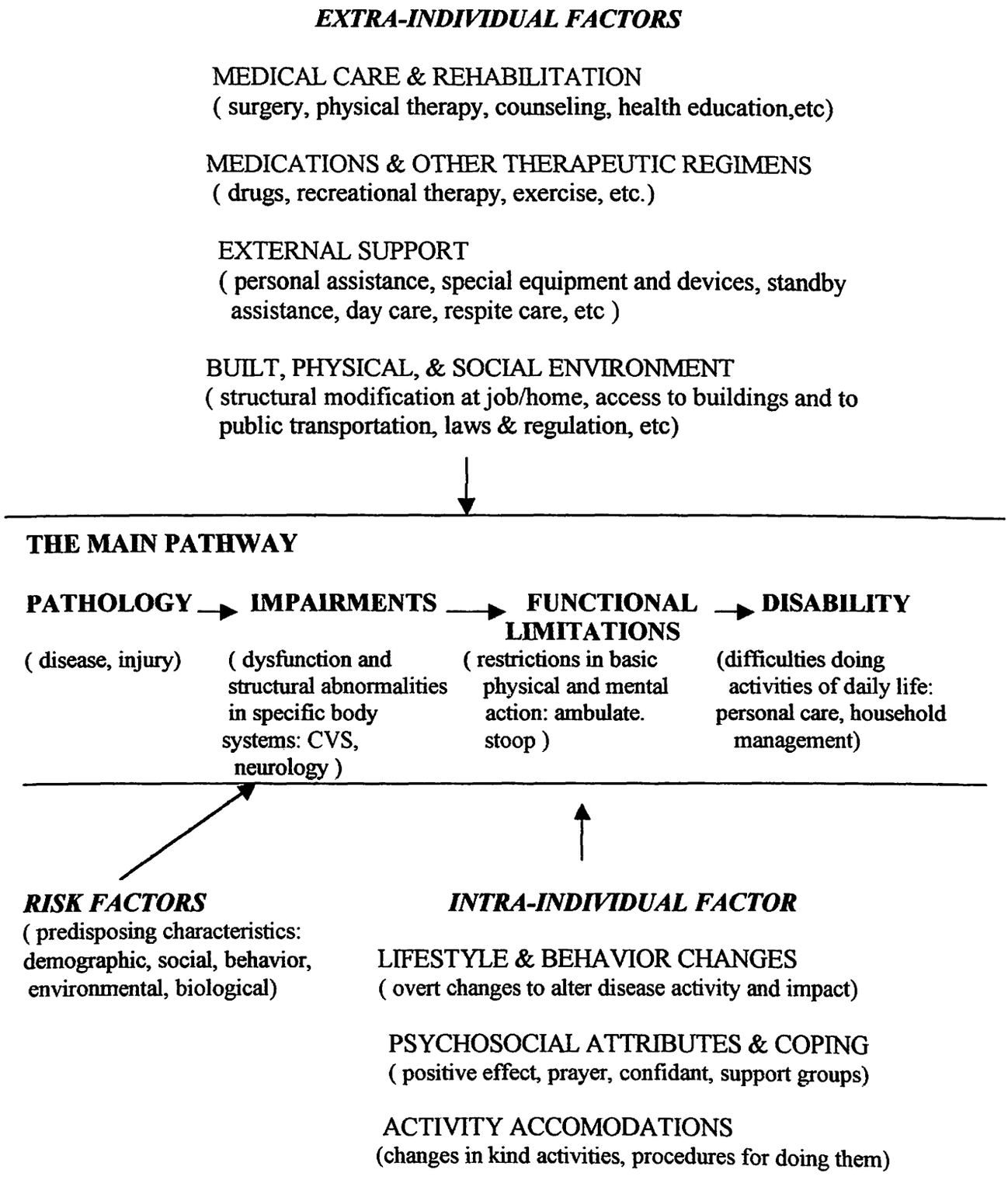


Figure 1.4.2 : A model of The Disablement Process

1.4.3. Measurement

Measures of physical disability have been developed over the last 40 years to characterize health status, prognosis, present and projected health services needs, and for programmatic evaluation. For example Activities of Daily Living (ADLs) scale, Instrumental activities of daily living (IADLs) and Barthel Index. Table 3.1 summarized the advantage and disadvantage of these scales. These scales have been widely applied in both clinical settings and population-based studies to define functional status and care needs and guide health policy for the aging population (Gallo et al,1995, McDowell & Newell, 1987, Larson, 1991 and Maguire, 1996). For epidemiological studies, disabilities have been measured with various instruments. The number of items included varies, as does the mode of administration and the definition of disability. Although very few instruments cover all aspects of the WHO classification of disabilities, they all can be categorized according to the different subclasses of this classification. The "personal care and dexterity disabilities" in the WHO classification are usually measured by the so-called activities of daily living (ADLs). The first and still widely used scale was proposed by Katz and colleagues (Hebert , 1997). This scale is an ordinal index designed to assess the physical functioning of elderly and chronically ill patients. Originally this index derived from observations of old people with fracture of the hip, however after observations of 1001 individuals it was demonstrated that this index also can be applied to others conditions (Katz *et al*, 1963). A dichotomous rating (dependent/independent) of six ADLs function (in order of decreasing dependency) : bathing, dressing, going to

toilet, transferring from bed to chair, continence, and feeding, rated on a three-point scale of independence.

Table 3.1: Various type of measurement of physical disability

Type of measurement	Advantage	Disadvantage
Katz ADLs	i. Have conceptual basis ii. Good reliability (0.74-0.88) iii. The most widely used iv. More specific and concrete v. Relatively easy and quick to administer	ii. Less objective
IADLs	i. Indicator of " applied' problems in physical disability ii. More sensitive to detect minor disability iii. Can detect gcognitive impairment indirectly.	i. Influenced by cultural and gender biases
Barthel Index	i. High test-retest reliability.	i. No information regarding conceptual basis ii. Uses a rudimentary scoring; changes in number did not reflect the changes in physical disability iii. Scale is restricted in its scope.
Performance – based e.g - Nagi' scale - Lower extremity disability	i. More valid and objective ii. Less influence by cognitive function, culture, language and education.	i. Time-consuming ii. Have significant inter-observer variability iii. Difficult to standardize and interpret iv. Need trained interviewer

In empirical studies of aging, Katz noted that the loss of functional skills occurs in a particular order, in which the most complex functions are lost first and the least complex later. He concluded that the Index of ADLs appears to be based on primary biological and psychological function and reflects the adequacy of organized neurological and locomotor's response (McDowell & Newell ,1987). ADLs are more specific and concrete than an inability to perform a " major activity", thus avoiding situational or contextual differences among survey respondents. Another advantage of ADLs is that they can be used to provide general information on the basic service needs of the disabled. Finally, ADL status is a good predictor of a wide range of health-related behavior (Wiener *et al*, 1990). The WHO's "body disposition disabilities" are usually related to the instrumental activities of daily living (IADLs) and encompass the following domestic function : housekeeping, cooking, shopping, washing, using the telephone, using transportation, taking medication and budgeting. This scale was developed by Lawton & Brody in 1969. The IADL methods offer indicators of "applied" problems that extend the disability theme of ADL scales to include some elements of handicap concept. The development of IADL scale was stimulated in part by the movement towards community care for the elderly (McDowell & Newell,1987).

How is disability measured ? The standard, and only economical procedure is to interview individuals about difficulties (self-reports or proxy reports), with simple ordinal or interval scoring of degree-of-difficulty. Most knowledge of functional status is based on self-reported measures of daily routine activities. The basic ADLs, based on items from Katz et al, are the most common measures, but self-reported measures on

mobility and IADLs are also widely used. However, disadvantages have been described for self-reported measures. An alternative is to observe performance of an activity in the person's usual milieu, but this approach is very time-consuming. This is especially true for activities done outside the home, such as shopping, since the interviewers and subjects must venture forth together for the performance assessment (Verbrugge & Jette,1994). Performance-based functional status that evaluate performance on standing balance, walking speed, chair stand, and external shoulder rotation are time-consuming, and that they only simulate an activity without reflecting adaptations people make in daily life (Hoeymans *et al*, 1996). Performances-based measures of functional status have been developed mainly because they were considered to be less influenced by poor cognitive function, culture, language, and education, and therefore more valid and objective than self-reported measures. However, not all investigators have found performance measures to be superior. When performance measures were compared to self-reported measures of functional status, a discordance was found, which was ascribed to inaccurate reporting, measurement errors, or to the use of performance tasks that were simplification of performance in daily life, and therefore did not include all functions necessary for daily routine activities (Hoeymans *et al*, 1996). Based on disablement process proposed by (Verbrugge & Jette (1994), which was mentioned earlier, performances measures reflect functional limitations, whereas self-reported functional status refers more to disabilities. Study by Hoeymans *et al* (1996) has proved the performances-based measures of functional status to be practical and safe in the home setting and had a high level of compliance, however, a significant inter-observer variability was found. Although the interviewers were instructed and trained according to

a standardized protocol using the same videotape, instructions given to the participants may not have been identical. It was also found that performance-based measures are modestly associated with self-reported measures on a cross-sectional as well as a longitudinal basis. The two measures of functional status appear to be complementary, have their own contribution to the assessment of functional status rather than being two measures of the same concept. Other study by Hoeymans *et al* (1997) has found that both measures of functional status-self-reported disabilities and performances tests-were moderately to highly reproducible in the elderly population, with kappas and Pearson correlation coefficients ranging from 0.49 to 0.90. Reproducibility is a measure of the potential of the instruments to yield the same result for a single respondents on two separate assessments, which are closely spaced so that any variation is due to the reliability of the instrument rather than to changes in the respondent's status. They conclude that performance tests not to be more reproducible than self-reported measures. Only in very old or cognitively impaired persons, self-reported physical disability was less reproducible than in younger or unimpaired persons.

The functional outcome being investigated in this study is physical disability, defined as the inability to perform ADLs or IADLs. This outcome were chosen because of its critical importance to older people in the preservation of independence and high quality of life and because of its simplicity. Furthermore both these indicator are widely used, so easy to compare the result with other studies.

1.5. Prevalence of Physical Disability

Elderly people are prone to disability, and a significant proportion of life expectancy after 75 years of age is spent with the disabilities. Disabilities and frailty are common among the elderly in Malaysia and have been found to increase with age. This rise with age has implication on future services and care requirement as the absolute numbers of disabled elderly will increase with the growing population of the elderly (Arokiasamy, 1997).However there is lack of data regarding prevalence of disabilities in most parts of the developing world, including Malaysia (Chen *et al*, 1983).Malaysia Health report 2000 also stated that, precise up-to-date information on the amount of disability and incapacity among the elderly population is not available. Findings from study by Chen *et al*(1983) reported that prevalence rates of disabilities for 60 years aged-group was 348.5 per 1000, 65 years age group was 517.2 per 1000 and for age-group more than 70 years it was 612.9 per 1000. However in this study they defined the disability as any loss or reduction of functional activity, mentally, physically or socially that results from a physical or mental condition. It include both " impairments" and " handicaps". A study by World Health Organization (WHO) in 1984/85 in Malaysia found that 11 per cent of the elderly population were retired with disability. In this study, the term of disability were included such as accident, injury , chronic illness or health problem. From these disabled condition, 26% indicated that these had affected their activities of daily living. Another local study in 1992 by the Institute of Strategic and International Studies (ISIS) and the National Population and Family Development Board had shown that about 28.3 per cent of the male elderly and 34.1 per cent of female elderly perceived themselves to be fully able. The latest study by Ministry of Health was among elderly population who

stayed at home in rural areas in 1995. It showed that majority (77.1`%) were able to move independently in the vicinity of their home and only a small proportion (1.3%) were bed-ridden (Malaysia Health Report 2000). In a study conducted in Singapore, 13.4% of the residents in old people's homes were disabled (Phoon , 1988). In 1989 a survey of persons aged 60 years and over was conducted in Thailand to determine the prevalence of physical disability. It was found that there were few elderly persons reporting difficulty performing basic physical activities of daily living due to the very low proportion of older elderly in that area. Only 13.3% of men and 14.5% of women reported some degree of urinary incontinence; however, most of them complained of only slight incontinence at occasional intervals (Swaddiwudhipong *et al*, 1991).

Slightly more than 20% reported that they were unable to accomplish one or more Instrumental's Activities of Daily Living (IADLs) without help (Dargent-Molina *et al*, 1996). Study by Fried *et al* (1994) found that 26% of the elderly reported difficulty with one or more IADLs, and 7% reported difficulty with one or more ADLs; the proportions with difficulty increased over 2-fold from those 65-74 to those 85 years or older. Bulletin of the WHO, 2001 reported that the prevalence of ADLs was 3.6% and the prevalence of IADL was 28% from the study in two areas of Zimbabwe. The annual incidence of improvement among disabled individuals lies between 7.5% and 17.9% (Hebert, 1999). These percentage confirm not only that functional decline is a very important health problem in this aged population but also that this phenomenon is not irreversible.

1.6 . Risk Factors of Physical Disability

Risk factors may be defined as innate or acquired characteristics of individuals which are associated with an increased likelihood of a disease or condition. Of particular importance are those factors which are amenable to change and/or treatment, since it may be possible to alter the risk of morbid and mortals events by altering the risk factor.

To avoid enormous increases in the size of the dependent population over the next 50 years, active life expectancy must be extended. To achieve this goal, we need to examine the prospects of preventive health practice among the aged. Since age related physiologic changes as well as extended exposure to environmental risks make it unlikely that the major diseases will be eliminated, the most promising approach to prevention in the aged population is to reduce the functional consequences of disease and aging (Mor *et al*, 1989). Prevention is one of the viable alternatives to the increasing cost of medical care, there is an important need to understand what modifiable risk factors consistently predict healthy aging and to use this information as the scientific basis for systematic interventions designed to enhance the health of the elderly.

1.6.1. Socio-demographic Characteristics

Socioeconomic status continues to be one of the most powerful social structural predictors available in health research. The following factors have been identified to be associated with physical disabilities in elderly : low economic level; low education; being widow or widower; increasing age, female and living alone. Armenian *et al* (1998) has found that age, female gender, and less than a high school education were significantly related to disability. A longitudinal study by Lammi *et al* among elderly Finnish men in

1989 also found that higher age and lower education were strongly associated with physical disability. Similar findings from the study by Clark *et al* (1998) which has reported that, the strongest predictors of physical disability onset were female sex and less education. Study by Maddox *et al* (1994) has showed that persons who are poor at baseline and/or have had no years of college education are significantly more likely to experience disabling impairment over the subsequent 10 years than are non-poor and/or college educated persons. Further, with income and education controlled, females are less likely than males to experience disabling impairment. The increased risk of physical disability in women is possibly related to the higher prevalence of symptoms/chronic diseases, and other poorer social and psychological conditions (Ho *et al*, 1997).

Educational level can be assumed to correlate with the knowledge of health matters and services as well as the ability and willingness to acquire and adapt new information concerning them. In old cohorts particularly it is also likely to be associated with the socioeconomic conditions in childhood which have important implications for as well material as no-material circumstances during one's life. These factors, again, probably correlate with such factors as health behavior and use of health services (Martelin, 1994). Study by Leveille *et al* (1999) has shown that, in men, 30 percent of those with more than 12 years of education survived to age 80 and then died without disability compared with 23 percent of men with less than 8 years of education.