UNIVERSITI PUTRA MALAYSIA

FACTORS ASSOCIATED WITH FUNCTIONAL STATUS AMONG FREE-LIVING ELDERLY IN MUKIM BATU, GOMBAK, MALAYSIA

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FPSK(M) 2015 79

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By

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Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Science

June 2015

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

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June 2015

Chair : Zuriati Ibrahim, PhD
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Globally, the population of older people is on the rise and has the fastest growing rate in the light of the universal decline in fertility and the increase in life expectancy. The rapid ageing population will indirectly leads to an increasing number of disabled older people that will adversely affect their ability to carry out daily tasks independently. Thus, functional decline among the aged should become a growing concern.

The main objective of this study is to determine the prevalence and factors that predict functional status among the free-living elderly. A cross-sectional study was conducted in Mukim Batu, sub-district of Gombak, Selangor. Two hundred and fifty eight older people aged within 60 to 88 years were undergone tests of functional status (self-reported physical disability and performance-based functional limitation). Instrumental Activities of Daily Living (IADL) instrument were used to assess self-reported physical disability, whereas performance-based functional limitation were assessed in terms of cognitive functioning, mobility status, manual dexterity and muscle strength performance. Factors associated (socio-demographic, lifestyle, presence of chronic diseases, psychosocial, risk of falls and anthropometric indicators) with self-reported physical disability were tested. The same approach to examine the associations between these factors and each functional limitation were carried out.

Physical disability as assessed using IADL reveals that more than half (58.1%) of the respondents were fully dependent (IADL<8). In terms of functional limitation, the prevalence of cognitive impairment [Elderly Cognitive Assessment Questionnaire (ECAQ)<6] and mobility dependent [Elderly Mobility Scale (EMS)<14] were low, at almost four percent each. Manual dexterity as using a lock and key test to assess the ability of the respondents to make coordinated hand and finger movements showed that only 4.7% of them were unable to perform the task. In Binary logistic regression (LR) analyses, factors found to be remained significantly predict IADL physical disability were advanced age (≥75 years: OR 6.4; 95% CI 1.3, 30.8), unmarried (OR 2.5; 95% CI 1.1, 5.9), unemployed/retired (OR 2.3; 95% CI 1.2, 4.3), and at risk of falls (OR 2.5; 95% CI 1.3, 6.1) with Nagelkerke R Square shows that about 33.3% of the variation in physical disability was explained by the model. In terms of functional limitations,

multiple linear regression (MLR) model for cognitive functioning indicate that increasing age ($p<0.01$), unemployed ($p<0.05$) and those without formal education ($p<0.01$) predicts cognitive impairment with 25% of the variance in cognitive functioning was explained by the model. The predictors of mobility dependent were increasing age ($p<0.001$), without any formal education ($p<0.01$), never participate in any activity/social programs ($p<0.01$), rated their health poorly ($p<0.001$) and having high risk of falls ($p<0.001$) with 67% of the variance in mobility functioning was explained by the model. Factors that predict poor manual dexterity were increasing age ($p<0.05$), having poor social relations ($p<0.001$) and rated own health poorly ($p<0.05$) with 23% of the variance in manual dexterity was explained by the model. MLR model for muscle strength indicates that increasing age ($p<0.05$), being female ($p<0.01$), had formal education ($p<0.05$), having good/excellent perception on health ($p<0.05$), never consume alcohol ($p<0.05$), high risk of falls ($p<0.001$), and low skeletal muscle mass (SMM) ($p<0.01$) were the predictors of poor muscle strength with 64% of the variance in muscle strength was explained by the model.

In conclusion, self-reported physical disability indicated a higher degree of poor functional status than functional limitation assessed by performance-based in this study, while association with socio-demographic and other health-related factors were consistent with other studies. Thus in a bigger perspective, any geriatricians intended to do research in the field of functional status should assess both self-report of physical disability and performance-based functional limitations, as it complements each other. Indeed, functional status assessment should be multidisciplinary involving several appropriate specialists, to identify and understand the factors considered to be the primary drivers of disability and limitations among elderly, in addition to devise and implement strategies for preventing or delaying the onset of functional decline in the elderly.

Abstrak tesis yang dikemukan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Sarjana Sains

FAKTOR-FAKTOR BERKAITAN STATUS FUNGSIAN DALAM KALANGAN WARGA TUA DI MUKIM BATU, GOMBAK, MALAYSIA

Oleh

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Secara global, populasi warga emas mengalami kadar pertambahan yang sangat pesat disebabkan penurunan kadar kesuburan serta peningkatan jangka hayat penduduk. Peningkatan populasi warga emas yang pesat ini secara langsung menyebabkan pertambahan bilangan warga emas yang hilang keupayaan fungsi untuk berdikari melakukan aktiviti asas seharian. Oleh itu, kemerosotan status fungsian dalam kalangan warga emas harus diberikan perhatian sewajarnya.

Fokus utama kajian ini bertujuan menentukan prevalens dan mengenalpasti faktor-faktor yang meramal status fungsian dalam kalangan warga tua yang tinggal dalam komuniti. Satu kajian keratan rentas telah dijalankan di Mukim Batu, dalam Daerah Gombak, Selangor. Seramai 258 orang warga tua berusia 60 hingga 88 tahun telah terlibat menyertai ujian status fungsian (laporan sendiri ketidakupayaan fizikal dan ujian prestasi limitasi fungsian). Indeks aktiviti hidup harian instrumental (Instrumental Activity Daily Living, IADL) digunakan untuk menilai laporan sendiri ketidakupayaan fizikal, manakala ujian prestasi limitasi fungsian dinilai dari segi kognitif, mobiliti, kemahiran tangan dan kekuatan otot. Faktor-faktor berkaitan seperti latar belakang demografi, gaya hidup, penyakit kronik, psikososial, risiko terjatuh dan parameter antropometri dikenalpasti untuk menguji perkaitan dengan laporan sendiri ketidakupayaan fizikal dan setiap ujian prestasi limitasi fungsian.

Hasil kajian mendapati lebih daripada separuh responden (58.1%) melaporkan memerlukan bantuan dalam aktiviti rutin harian (IADL<8). Dari sudut limitasi fungsian, prevalens masalah kognitif (ECAQ<6) adalah 3.5% manakala masalah mobiliti (EMS<14) adalah 3.9%. Ujian kemahiran tangan, iaitu ujian *lock and key* yang menilai keupayaan responden mengkoordinasi pergerakan tangan dan jari menunjukkan hanya 4.7% sahaja yang tidak berupaya melakukan aktiviti tesrsebut. Dalam analisis regresi logistik binari (LR), faktor-faktor yang meramal ketidakupayaan fizikal adalah peningkatan umur (≥75 tahun: OR 6.4; 95% CI 1.3, 30.8), tidak berkahwin (OR 2.5; 95% CI 1.1, 5.9), tidak bekerja/pencen (OR 2.3; 95% CI 1.2, 4.3), dan mempunyai risiko terjatuh (OR 2.5; 95% CI 1.3, 6.1) dengan peratusan *Nagelkerke R Square* menunjukkan 33.3% varians ketidakupayaan fizikal dijelaskan daripada

model. Dari sudut limitasi fungsian, model daripada analisis regresi linear berganda (MLR) untuk meramal fungsian kognitif pula menunjukkan peningkatan umur ($p<0.01$), tidak bekerja ($p<0.05$) dan tidak mempunyai pendidikan formal ($p<0.01$) menjadi faktor peramal kepada masalah kognitif dengan 25% varians fungsian kognitif dijelaskan daripada model. Peningkatan umur ($p<0.001$), tidak mempunyai pendidikan formal ($p<0.01$), tidak melibatkan diri dalam aktiviti/pogram social ($p<0.01$), mempunyai persepsi status kesihatan diri yang neutral/teruk ($p<0.001$) dan peningkatan risiko terjatuh ($p<0.001$) pula menjadi peramal kepada masalah mobiliti dengan 67% varians fungsian mobiliti dijelaskan daripada model. Manakala faktor-faktor yang meramal kepada masalah kemahiran tangan adalah peningkatan umur ($p<0.05$), mempunyai kurang hubungan sosial/masyarakat ($p<0.001$) dan mempunyai persepsi status kesihatan diri yang neutral/teruk ($p<0.05$) dengan 23% varians fungsian kemahiran tangan dijelaskan daripada model. Model MLR untuk meramal kekuatan otot pula menunjukkan peningkatan umur ($p<0.05$), seorang wanita ($p<0.01$), mempunyai pendidikan formal ($p<0.05$), mempunyai persepsi status kesihatan diri yang baik/sangat baik ($p<0.05$), tidak pernah mengambil minuman beralkohol ($p<0.05$), mempunyai risiko terjatuh ($p<0.001$) dan jisim otot rangka (SMM) yang rendah ($p<0.01$) adalah faktor-faktor penyumbang kepada kemerosotan kekuatan otot dengan 64% varians fungsian kekuatan otot dijelaskan daripada model.

Kesimpulannya, laporan sendiri ketidakupayaan fizikal menunjukkan anggaran prevalens kemerosotan status fungsian yang lebih tinggi berbanding ujian prestasi limitasi fungsian, manakala perkaitan dengan latar belakang demografi serta faktor-faktor berkait kesihatan adalah konsisten dengan kajian-kajian semasa. Maka dalam perspektif yang lebih luas, kajian berkaitan status fungsian dalam kalangan warga tua haruslah menggabungkan laporan sendiri ketidakupayaan fizikal dan ujian prestasi limitasi fungsian, kerana kedua-dua kaedah ini saling melengkapi. Malah, penilaian status fungsian perlu melibatkan pelbagai pakar daripada pelbagai bidang berkaitan untuk mengenalpasti faktor-faktor utama yang menyebabkan kemerosotan status fungsian dalam kalangan warga tua, serta merancang dan melaksanakan strategi untuk mencegah atau sekurangnya melewatkan masa mula kemerosotan status fungsian dalam kalangan warga tua.

ACKNOWLEDGEMENT

In the name of Allah, the most gracious, the most merciful. Every praise is due to Allah S.W.T alone, and peace and blessings be upon His messenger, Prophet Muhammad (S.A.W). These past three years have not been an easy ride for me, both academically and personally. Perhaps, completion of this thesis would not been possible without the many individuals who have assisted and motivated me throughout the whole master process.

First and foremost, I would like to express my deepest gratitude to my supervisor, Dr. Zuriati Ibrahim, whose expertise, knowledge and skills particularly in the field of geriatrics has added considerably to my graduate experience. I also appreciate her assistance, patience, understanding and most importantly, having the faith in me being her postgraduate student. I am personally very grateful for her, nurturing my academic and personal development in so many ways. I am indeed grateful to her for giving me a permission to undergo a surgery on my left knee (due to sport injury), during my study. Special credit to the other members of my committee, Assoc. Prof. Dr. Chan Yoke Mun and Dr. Siti Nur 'Asyura Adznam for the assistance they provided at all levels of my master research project. Their comments, recommendations and guidance to improve this research were decisive. Although it was quite short period of time, I have to acknowledge my ex co-supervisor, Assoc. Prof. Dr. Zaitun Yassin as well, for her vast knowledge, sharing experience and tips, before she was retired. I feel privileged to have met and supervised by the three of them, which have made my master an interesting journey.

Getting through my research project required more than academic support, and I have many, many special friends and postgraduate students to thank for listening to and, at times, having to tolerate me over the past three years. First, a heartiest thank you to my fiancé, Sharifah Intan Zainun. Words cannot describe how lucky I am to have her in my life. She has selflessly given more to me than I ever could have asked for. She has been a never-ending source of motivation and encouragement, and I am really looking forward to our lifelong journey till Jannah. Special thanks to Wan Firdaus and Mazni, who always acts as my brother and sister respectively. They were always there when I'm in need. May Allah bless our ukhuwah till Jannah, InsyaAllah. Faez, Dahlan, Syazwan, Zaini, Ainaa, Aina, Roa, Fairus, Hafizah, Hanim, Khairiah and Nabilla, thanks for the invaluable help, advice, motivation and encouragement during my study. It's been pleasure to have met them all. May Allah bless and reward them with success.

Finally, and most importantly, none of this could have happened without the great support from my family members, particularly mom and dad. Thanks for the wholehearted prayers and for patiently waited for me to finish. Even though they weren't always sure about what I've been doing all this while, I hope they enjoyed watching me do it and thanks for everything. I love you all dearly.

I certify that a Thesis Examination Committee has met on 26 June 2015 to conduct the final examination of Muhammad Faizal bin Murat on her thesis entitled "Factors Associated with Functional Status among Free-Living Elderly in Mukim Batu, Gombak, Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committees were as follows:

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Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

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AADL	Advanced activities of daily living
ADL	Activities of daily living
AHEAD	Asset and Health Dynamics of the Oldest Study
ALSA	Australian Longitudinal Study of Ageing
AMA	Arm muscle area
AMI	Appendicular muscle mass index
ARIC	Atherosclerosis Risk in Communities
BADL	Basic activities of daily living
BCM	Body cell mass
BIA	Bio Impedance Analysis
BMI	Body Mass Index
CC	Calf circumference
CDC	Center for Disease Control and Prevention
CED	Chronic energy deficiency
CHD	Coronary heart disease
CI	Confidence intervals
COPD	Chronic obstructive pulmonary disease
DEGIS	Darul Ehsan GIS
DEXA	Dual-energy x-ray absorptiometry
DHQ	Diet History Questionnaire
ECAQ	Elderly Cognitive Assessment Questionnaire
EMS	Elderly Mobility Scale
FFM	Fat-free mass
FRI-21	21-Item Fall Risk Index
HAQ	Health Assessment Questionnaire
HMSN	Hereditary motor and sensory neuropathy
HOS	Health Outcomes Survey
HSE	Health Survey for England
IADL	Instrumental activities of daily living
ICF	International Classification of Functioning, Disability and Health
ISA	Ibadan Study of Aging
KNHANES	Korea National Health and Nutrition Examination Survey
LR	Logistic regression
MAC	Mid-arm circumference
MAMC	Mid-arm muscle circumference
MHQoLOM	Mental Health and Quality of Life Older Malaysian Survey
MLR	Multiple linear regression
MMSE	Mini-Mental State Examination
MNA-SF	Mini Nutritional Assessment Short-Form
MRI	Magnetic Resonance Imaging
MRST-C	Malnutrition Risk Screening Tool for Community
MRST-H	Malnutrition Risk Screening Tool for Hospital
MUAC	Mid upper arm circumference
NCVHS	National Committee on Vital and Health Statistics

NHANES III	Third Nutritional Health and Nutrition Examination Survey
NHIS	National Health Interview Survey
NSI	Nutrition Screening Initiative
RNI	Recommended Nutrient Intake
ROS	Reactive oxygen species
RR	Relative risk
SABE	Survey on Health, Well-Being, and Aging in Latin America and the Caribbean
SEE	Standard error of the estimates
SHT	Sollerman hand function test
SLAS	Singapore Longitudinal Ageing Study
SMI	Skeletal muscle index
SMM	Skeletal muscle mass
SSADD	Shanghai Survey of Alzheimer's Disease and Dementia
WC	Waist circumference
WHO	World Health Organization
WHR	Waist hip ratio
%TBF	Total body fat percentage

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

The definition of elderly was adopted at the World Assembly on Ageing conveyed by the United Nations in Vienna in 1982, as the group of people aged 60 years and above (WHO, 1989). Until then, the lower limit age of an older people has been accepted widely starting from 60 years of age (Karim, 1997; Pala, 1998). Similarly in Malaysia, the term elderly refers to those chronologically 60 years old and above (Department of Social Welfare Malaysia, 2013).

Globally, the population of older people is on the rise and has the fastest growing rate in the light of the universal decline in fertility and the increase in life expectancy. The proportion of world population aged 60 years and above has increased from 8.0% in 1950 to 11.0% in 2009, and according to the United Nations (2010), a nation will be categorised as an aged nation if there are more than 7% of the population that comprised of the older adults. The proportion of older people globally is projected to achieve 22% in 2050 representing 2 billion of people (United Nations, 2010).

Initially, population of aging starts in the developed countries, where immediate concern is already well advanced with consequences that impact every aspect of life (Gutiérrez-Robledo, 2002). Demographic transition has now become apparent in many developing countries, although the intensity varies considerably among countries (Population Reference Bureau, 2007). The United Nations projected that 72% of the population over 60 years of age will be living in developing countries by the year 2025 (United Nations, 2001). Additionally, older people in developing countries are expected to experience more chronic diseases and poor functional status than in developed countries (Harwood, 2003; Gutierrez-Robledo, 2002), since socio-economic development does not take place in line with aging population.

Malaysia like any other developing countries is also experiencing demographic transition which leads to an aging nations and increment number of elderly population since 1960's (Pala, 1998). Arokiasamy (2000) postulated that with increased longevity, low mortality, declined fertility and healthier living environment, the proportion of elderly among the Malaysian population will increase from 6.2% in 1990 to an estimated 11.3% by 2020. In 2050, it is estimated that the percentage will be increased dramatically by four-fold to almost 21% (Department of Statistics, Malaysia, 2003). In fact, the life expectancy at birth in 2010 has rose to 71.9 years and 77.0 years for Malaysian males and females respectively (Department of Statistics, Malaysia, 2011). Currently, Malaysia is now at the third stage of demographic transition (low crude birth rate and low crude death rate) with increasing longevity and non-communicable diseases towards an ageing society (Rahimah, 2013).

Ageing is characterised by a generalised deterioration of many organs and systems, which leads to a lower effectiveness of physiological functions accompanied by an increase in risk factors for various chronic diseases (Sharma, Mazta & Parashar, 2013). Ageing is also declared by progression loss of adaptability of an organism at later ages (Rose, 2009). These changes may be more prevalent in older people because they are true expression of senescence of biological systems or because of the greater length of time older people have lived, and hence the greater opportunity they have had to experience the risks or exposures that produce these effects (Albert, Im & Ravies, 2002). The trend towards an increase of the ageing population in Malaysia is expected to rise and this will obviously have many health implications. Thus, it can be assumed that the proportion of older people with poor functional status will also increase concurrently since disability and limitation incident increase exponentially with age.

Functional status is variously defined in the health field, by clinicians with different emphasis. National Committee on Vital and Health Statistics (NCVHS) (2001) defines functional status as both the status of an individual able or unable to carry out activities of daily living independently and the ability of the individual participating in life situations and society. Functional status is affected by physical, developmental, behavioral, emotional, social, and environmental conditions. These conceptions encompass the whole person, as he or she engaged in physical and social environment. It applies across the lifespan, although interpretation of functional status may differ for different age groups (NCVHS, 2001). Functional status comprises of two distinct aspects which are physical disabilities and functional limitation.

Physical ability is the ability to perform basic physical activities of daily life without support, which is the key to overall independence and quality of life (Manandhar, 1995). A report for WHO by Heikkinen (2003) stated that physical disability is defined in terms of difficulty in the ability to perform activities of daily living (ADL), or the inability to function independently in terms of basic ADL (BADL) or instrumental ADL (IADL). Physical disabilities relate to person's ability of socially life tasks expected of an individual within a typical socio-cultural and physical environment (Nagi, 1976).

In contrast, functional limitation refers to limitations in the person's performance of certain actions or task which occurs when a person's capacity to carry out such actions is compromised or restricted due to a health condition or injury and is not compensated by environmental factors including physical, social, and attitudinal factors (Nagi, 1976). In gerontology, measures of functional limitation are utilised as outcomes that indicate the impact of disease, impairments, and other risk factors on function. In turn, measures of functional limitation can be used to characterise the functional status of individuals and populations, and are powerful predictors of various adverse outcomes, including dependency incident in people not currently disabled (Guralnik & Ferrucci, 2003).

Several socio-demographic characteristics have been identified for the association with functional status (Fiksenbaum, Greenglass, Marques, & Eaton, 2005). Modifiable behavior such as dietary intake, smoking habit and alcohol consumption may also

influence on functional status among older population (Arday et al., 2003; Sharkey, Branch, Giuliani, Zohoori, & Haines, 2003; Sulander et al., 2005). Chronic disease could also be related towards many health outcomes, particularly among the elderly, it was the primary factor associated with disability (Fried et al., 1994). While psychosocial is among the most commonly assessed and simplest measures for ascertaining an individual's health, numerous studies have also demonstrated the psychosocial factor as independent predictors of physical functioning and survival among the aged (Nascimento et al., 2012). It is also important to assess the nutritional status of older people because of its association with functional ability and its role in ensuring a better quality of life (Suzana, Hanis, Tang, Ayiesah, & Roslina, 2008). Disability can affect nutritional status by impending participation in production, acquisition and preparation of food as well as in eating. This make the elderly people an especially the vulnerable group with a higher risk of nutritional deficiency (Nyaruhucha, Msuya & Matrida, 2004). Falls are another major problem in the elderly and complications arising from falls causing a significant decrease in functional status, serious injury, and increased utilisation of medical services which leads to morbidity and mortality (WHO, 2007). A fall has been defined as a sudden unexplained change in position that results in an individual coming to rest unintentionally on the ground or lower level (Rubenstein, Robbins, Josephson, Schulman, & Osterweil, 1990).

1.2 Problem statement

Apart from an increase in the proportion of the aging population, the aged are also living longer as evidenced by an increase in life expectancy. The rapid ageing population will indirectly leads to an increasing number of disabled older people since the elderly can be expected to have many health problems that will adversely affect their ability to carry out daily tasks independently. With all these increased, it emerges a newer needs of this group, which are being felt in all sectors of human sustenance, be it health, social or economic (Reddy & Rao, 2010).

Since people in general are living longer than in the past, functional decline associated with increasing age has becoming a growing concern (Fiksenbaum et al., 2005). Physical disability and functional limitation are common among the elderly, leading to both individual and societal adverse consequences such as institutionalisation and dependency. Dependence is the main impact factor on health and quality of life, not only for the elderly but also for the caregiver and relatives (Millan-Calenti et al., 2010). Older people's ability to function independently is important, as physical disability and functional limitation have profound public health implications with increased utilisation of health care and a need for supportive services and long term care (Melzer et al., 1999; Larry, 2005). A strong association between functional disability and predictor of morbidity and mortality has also been reported among free-living elderly populations (Millan-Calenti et al., 2010).

Disability also imposes an enormous cost to the nation and society in term of medical resources used for care, treatment, and rehabilitation. The costs to seniors' health and independence, as well as the financial burden will continue to grow if nothing is done to change the situation. In Malaysia, government has spends about 3.4% of development expenditure solely on geriatric health services (Pala, 2005). In future, a

long term care is important for people with disabilities and will be one of the major challenges of the twenty-first century (Stone, 2002).

The clearly established trend towards an increasingly aged population has focused national attention on the health and well-being of older Malaysians. A comprehensive approach to disability and limitation prevention is thus required that would focus on modifiable individual and environment risk factors. Although many studies on physical disability and functional limitation have been carried out in developed countries, however, data are sparse for developing countries especially among the elderly in Malaysian community. Even if there are studies in Malaysia, mostly were only focusing on single functional status assessment by either self-reported physical disability or performance-based functional limitation, without combining both. While several studies were indentified focusing on physical disability and cognitive functioning, quite limited research has been done on mobility status, manual dexterity and muscle strength among elderly population.

Besides, not many are looking into the multidimensional predictors of the functional status. Functional status assessment involved multidisciplinary team including a physician, social worker, and physical and occupational therapists. However, lack of nutritionist involvement in functional status assessment particularly among the elderly has raised some question. Thus, the present study tried to fill the gap by inserting dietary intake as possible predictor of functional status. Due to the inconclusive finding from other studies, the present study also highlights fall risk and anthropometric assessment as predictors of functional status in this study.

1.3 Research questions

Since there is lack of information on prevalence and identified risk factors for functional status among free-living elderly in Malaysia, thus triggers this study to determine the following research questions:

1. What is the prevalence of functional status (physical disability and functional limitation) among the free-living elderly in Malaysia?
2. What factors significantly predict functional status among the free-living elderly in Malaysia?

1.4 Objectives of the study

General:

To determine the prevalence and factors that predict functional status among free-living elderly.

Specific:

1. To determine socio-demographic factors, lifestyle factors, presence of chronic diseases, psychosocial factors, risk of falls and anthropometric indicators [Body Mass Index (BMI), mid upper arm circumference (MUAC), calf circumference (CC), waist circumference (WC), body fat percentage (%TBF), skeletal muscle mass (SMM) & skeletal muscle index (SMI)] among the respondents.
2. To determine the prevalence of functional status (physical disability & functional limitations) among the respondents.
3. To determine the mean differences of variables (socio-demographic factors, lifestyle factors, presence of chronic diseases, psychosocial factors, risk of falls, anthropometric indicators and functional status) between gender (male and female) and age group (60-74 and ≥75).
4. To determine the association between socio-demographic factors, lifestyle factors, presence of chronic diseases, psychosocial factors, risk of falls and anthropometric indicators with functional status among the respondents.
5. To determine factors that predict functional status among the respondents.

1.5 Null hypotheses

1. There is no significant association between socio-demographic factors, lifestyle factors, presence of chronic diseases, psychosocial factors, risk of falls and anthropometric indicators with functional status among the respondents.
2. There is no factors that predict significantly the functional status among the respondents.

1.6 Research framework

The research framework (Figure 1.1) shows the relationship between independent variables and dependent variable. The framework classifies six main independent variables namely (1) socio-demographic factors; (2) lifestyle factors; (3) presence of chronic diseases; (4) psychosocial factors; (5) risk of falls; and (6) anthropometric indicators. The socio-demographic factors include age, gender, ethnicity, educational level, marital status, living arrangements and working status. Lifestyle factors include dietary intake, smoking habit and alcohol consumption. Social relations (visiting friends and relatives at least once a week), social participation (taking parts and/or attending social programs), self-rated health (perception of their own health status and compared to their peers) were all included under psychosocial factors. Anthropometric indicators include BMI, MUAC, CC, WC, %TBF and skeletal muscle.

The six main independent variables were selected due to the most reportedly to be included in other research studies. Anyway, the present study highlights several interesting variables (e.g. dietary intake and risk of falls) which may affect on functional status. These may add to the body and fill the gap of knowledge in terms of predictors of functional status. Besides, although anthropometric assessment variable

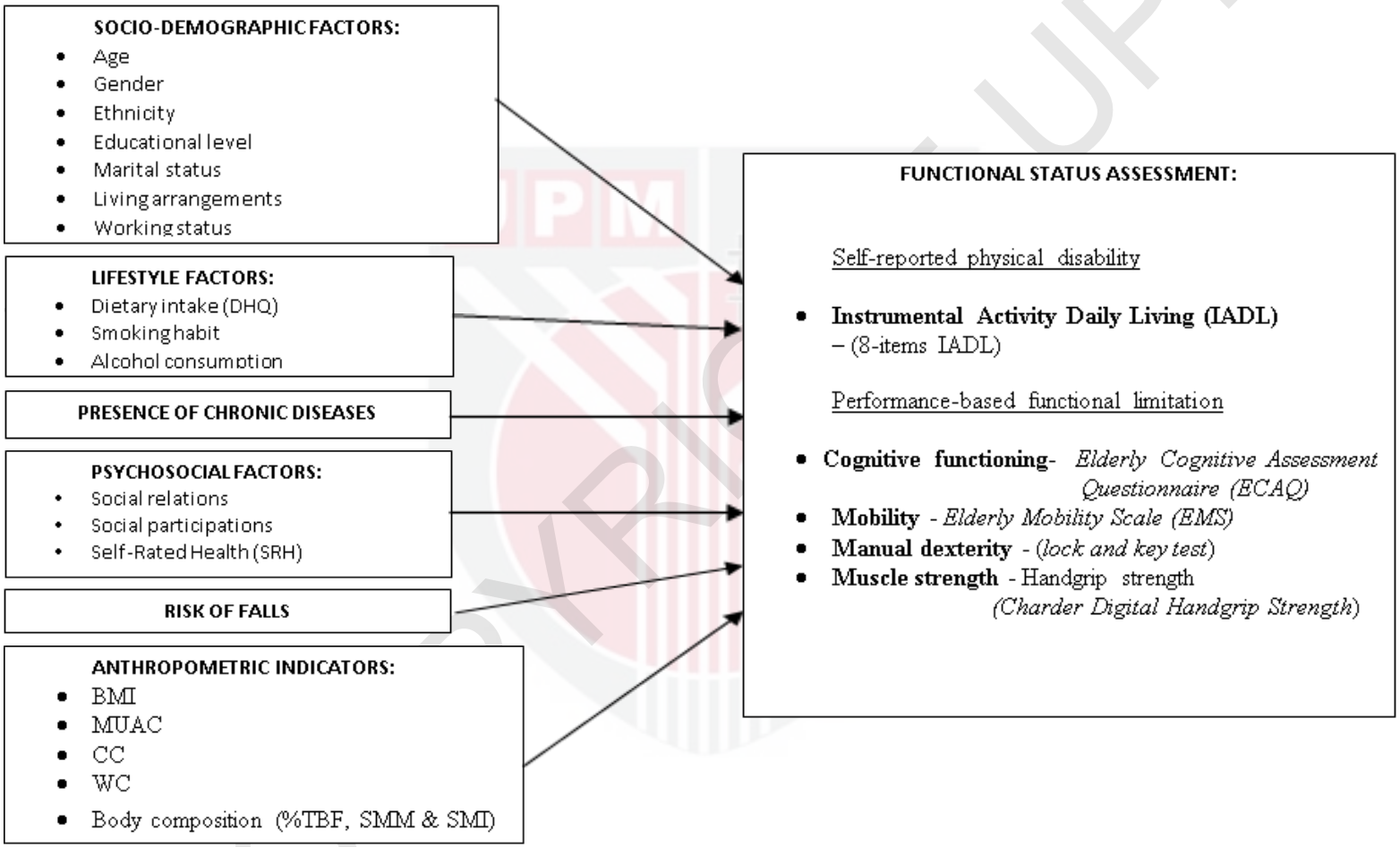

Figure 1.1: The research framework of the study

were recently included in most studies, the conclusive association with functional status were still yet to establish.

Dependent variable in this research framework is functional status which was assessed by self-report and performance based. Self-report measured physical disability whereas performance-based assessed the functional limitation on cognitive function, mobility status, manual dexterity status and muscle strength performance.

1.7 Significance of the study

This study attempts to determine the prevalence and explore the predicting factors on physical disability and functional limitation among the free living elderly in Mukim Batu, Gombak. It is hoped that the outcome from this study can contribute to the body of knowledge in understanding of various predictors that affect the functional status among elderly.

In addition, information from this study may serve as baseline data for the future research to determine the prevalence and other predicting factors on functional status among older Malaysian. Consequence from this study may inform practitioners to plan an appropriate intervention program among elderly who were found to be at risk of having poor functional status.

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