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FOOD INSECURITY AND DEPRESSIVE SYMPTOMS AMONG THE FREELIVING ELDERLY IN SELECTED VILLAGES IN PETALING DISTRICT, SELANGOR, MALAYSIA

SITI FARHANA BINTI MESBAH

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By

SITI FARHANA BINTI MESBAH

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

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

FOOD INSECURITY AND DEPRESSIVE SYMPTOMS AMONG THE FREE-LIVING ELDERLY IN SELECTED VILLAGES IN PETALING DISTRICT, SELANGOR, MALAYSIA.

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Chair: Associate Prof. Norhasmah binti Sulaiman, PhD
Faculty: Medicine and Health Sciences

Ageing population is growing faster than other population in both developed and developing countries due to the declining fertility rate and mortality rate. Health is a major concern among elderly. Food insecurity is associated with poor health and nutritional status. Elderly is one of the vulnerable groups to food insecurity. Food insecurity occurs whenever the availability and accessibility to acquire adequate and safe food in socially acceptable ways is limited or uncertain. Therefore, this study aimed to determine the prevalence of food insecurity and the factors associated with food insecurity among free-living elderly in selected villages in Petaling District, Selangor. Also, the association between food insecurity and depressive symptom among the elderly was determined in this study.

In this cross-sectional study, 220 respondents aged 60 to 87 years from two selected subdistricts in Petaling District, Selangor were recruited. Information on the demographic and socioeconomic background, oral health status, social support status, comorbidity status, functional status, food security status, and depressive symptoms were collected through face-to-face interviews. The independent variable, oral health status was assessed by using Geriatric Oral Health Status (GOHAI). Social support status was measured by using six-item Lubben Social Network Scale (LSNS-6) and food security status was measured by six-item USDA Food Security Status (FSS). Elderly Cognitive Assessment Questionnaire (ECAQ) was used to measure the cognitive status and Instrumental Activity Daily Living (IADL) was used to assess the physical capacity among the respondents. Elderly Mobility Scale (EMS) and handgrip dynamometer were used to assess the mobility status and handgrip strength respectively. Chi-square test and binary logistic regression analysis were used to

determine the association between factors and food insecurity. General linear model was used to determine the difference in depressive symptoms based on food security status after controlling for covariates.

Prevalence of food insecurity among elderly in Petaling District was 19.5% in which 18.2% of elderly had low food security and 1.3% of elderly had very low food security. Marital status (χ^2= 6.818, p <0 .01), education level (χ^2= 6.242, $p < 0.05$), occupation status (χ^2= 7.540, $p < 0.05$), house status (Fisher Exact test, $p < 0.01$), and monthly income (χ^2= 9.940, $p < 0.05$) were significantly associated with food security status. Further, oral health status (χ^2= 9.627, $p < 0.01$), cognitive status (Fishers Exact test, $p < 0.05$) and physical capacity (Fishers Exact test, $p < 0.05$) were significantly associated with food security status. Elderly with income below the Poverty Line Income (PLI) were two times more likely to become food insecure (AOR=2.355, 95% CI: 1.002, 5.533). Further, elderly with poor oral health status were almost three times more likely to become food insecure (AOR=2.927, 95% CI: 1.347, 6.359) while elderly living in a rented house ihad higher risk of becoming food insecure by sixfold (AOR=5.879, 95% CI: 1.331, 25.968). Food insecure elderly (3.63±1.76) had significantly higher depressive symptoms than food secure elderly (2.53±1.50) after controlling for covariates (F=15.084, $p < 0.01$).

In conclusion, about 19.5% of elderly in Petaling District, Selangor were food insecure. Monthly income of below than PLI, living in a rented house and poor oral health status were the factors associated with food insecurity. Food insecurity was associated with depressive symptoms after controlling for social support score and mobility score. As suggestion, nutrition assistance programme was proposed to reduce the prevalence of food insecurity among the respondents. Further, oral health checkup was suggested to be part of the medical checkup. Besides that, family members were advised to stay around and provide support to the respondents in order to reduce the economic hardships as well as improve mental health.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

TIADA JAMINAN KEDAPATAN MAKANAN DAN SIMPTOM KEMURUNGAN DALAM KALANGAN WARGA TUA DI KAMPUNG TERPILIH DI DAERAH PETALING, SELANGOR, MALAYSIA

Oleh

SITI FARHANA BINTI MESBAH

April 2018

Pengerusi: Prof Madya Norhasmah binti Sulaiman, PhD
Fakulti: Perubatan dan Sains Kesihatan

Populasi warga tua dijangka meningkat lebih cepat berbanding populasi lain di negara maju mahupun negara membangun disebabkan oleh penurunan kadar kesuburan dan kadar kematian. Kesihatan adalah salah satu kekuatiran utama dalam kalangan warga tua. Tiada jaminan kedapatan makanan dikaitkan dengan status kesihatan dan pemakanan yang kurang baik dalam kalangan warga tua. Warga tua merupakan salah satu daripada populasi yang terdedah kepada tiada jaminan kedapatan makanan. Tiada jaminan kedapatan makanan berlaku apabila kedapatan untuk memperoleh makanan yang mencukupi dan selamat dengan cara yang diterima oleh masyarakat adalah terhad atau yang tidak menentu. Oleh itu, kajian ini bertujuan untuk menentukan prevalens tiada jaminan kedapatan makanan dan faktor-faktor yang berkaitan dengan tiada jaminan kedapatan makanan dalam kalangan warga tua di kampung terpilih di Daerah Petaling, Selangor. Akibat tiada jaminan kedapatan makanan dalam kalangan warga tua juga dikaji dalam kajian ini.

Dalam kajian keratan rentas ini, seramai 220 warga tua yang berumur antara 60 ke 87 tahun dari dua mukim terpilih di daerah Petaling, Selangor yang memenuhi kriteria telah mengambil bahagian dalam kajian ini. Temubual dengan menggunakan satu set soal selidik telah dijalankan untuk mendapatkan maklumat yang berkaitan dengan latar belakang demografi dan sosioekonomi, status kesihatan oral, status sokongan sosial, status komorbit, status kefungsian, status jaminan kedapatan makanan, dan simptom kemurungan. Pembolehubah bebas; status kesihatan oral diukur dengan menggunakan Geriatrik status kesihatan oral (GOHAI). Status sokongan sosial diukur dengan menggunakan enam item skala Lubben Sosial (LSNS-6) dan status jaminan kedapatan makanan diukur dengan menggunakan enam item USDA status jaminan kedapatan

makanan (FSS). Penilaian kognitif warga tua digunakan untuk mengukur status kognitif and *Instrumental Activity Daily Living* (IADL) digunakan untuk mengukur kemampuan fizikal warga tua. Skala mobiliti warga tua (EMS) digunakan untuk mengukur status mobiliti dan kekuatan genggaman tangan di tentukan dengan menggunakan dinamometer. Ujian Khi-kuasa Dua dan analisis Perduaan Logistic Regresi digunakan untuk menentukan faktor-faktor berkaitan dengan tiada jaminan kedapatan makanan. Model linear umum digunakan untuk menentukan perbezaan simptom kemurungan berdasarkan kepada status jaminan kedapatan makanan selepas mengawal pembolehubah. Oleh itu, akibat tiada jaminan kedapatan makanan terhadap simptom kemurungan dapat ditentukan.

Prevalens tiada jaminan kedapatan makanan dalam kalangan warga tua di daerah Petaling adalah 19.5% yang mana 18.2% warga tua adalah rendah jaminan kedapatan makanan dan 1.3% warga emas adalah sangat rendah jaminan kedapatan makanan. Status perkahwinan ($\chi2$ = 6,818, p <0.01), tahun persekolahan ($\chi2$ = 7,947, p <0.01), tahap pendidikan ($\chi2$ = 6,242, p <0.05), status pekerjaan ($\chi2$ = 7,540, p <0.05), status rumah (Fisher ujian tepat, p <0.01), dan pendapatan bulanan ($\chi2$ = 9.940, p <0.01) mempunyai perkaitan yang signifikan dengan status jaminan kedapatan makanan. Status kesihatan oral (χ^2= 9.627, p < 0.01), kognitif status (Fisher ujian tepat, p<0.05) dan fizikal kapasiti (Fisher ujian tepat, p<0.05) mempunyai perkaitan signifikan dengan status jaminan kedapatan makanan. Warga tua yang pendapatan di bawah daripada garis kemiskinan (PLI) adalah dua kali lebih cenderung untuk mengalami tiada jaminan kedapatan makanan (OR = 2.355, 95% CI: 1.002, 5.533). Selain itu, warga tua yang mempunyai status kesihatan mulut yang kurang baik adalah tiga kali lebih berkemungkinan untuk mengalami tiada jaminan kedapatan makanan (OR = 2.927, 95% CI: 1.347, 6.359). Sementara itu, warga tua yang tinggal di rumah sewa meningkatkan risiko tiada jaminan kedapatan makanan sebanyak lima kali ganda (OR = 5.879, 95% CI: 1.331, 25.968) berbanding warga tua yang tinggal di rumah hak milik sendiri. Warga tua yang mengalami tiada jaminan kedapatan makanan mempunyai markah simptom kemurungan lebih tertinggi (3.63±1.76) berbanding warga tua yang mempunyai jaminan kedapatan makanan (2.53±1.50) selepas mengawal pembolehubah (F=15.084, P<0.01).

Kesimpulannya, kira-kira 19.5% daripada warga tua di daerah Petaling, Selangor tiada jaminan kedapatan makanan. Pendapatan bulanan di bawah paras kemiskinan, tinggal di rumah sewa dan status oral yang kurang baik merupakan faktor yang berkaitan dengan tiada jaminan kedapatan makanan. Tiada jaminan kedapatan makanan juga berkaitan dengan simptom kemurungan selepas mengawal markah sokongan sosial dan markah mobiliti. Program bantuan makanan dicadangkan untuk mengurangkan prevalens tiada jaminan kedapatan makanan. Pemeriksaan gigi secara berkala juga disarankan menjadi sebahagian daripada pemeriksaan kesihatan. Selain itu, ahli keluarga sangat penting dalam memainkan peranan untuk mengurangkan beban ekonomi dan memperbaiki kesihatan mental dalam kalangan warga tua.

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I certify that a Thesis Examination Committee has met on 2 April 2018 to conduct the final examination of Siti Farhana binti Mesbah on her thesis entitled "Food Insecurity and Depressive Symptoms among the Free-Living Elderly in Selected Villages in Petaling District, Selangor, 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.

Members of the Thesis Examination Committee were as follows:

Hazizi bin Abu Saad, PhD
Associate Professor
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Chairman)

Chin Yit Siew, PhD
Senior Lecturer
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Internal Examiner)

Hamid Jan bin Jan Mohamed, PhD
Associate Professor
Universiti Sains Malaysia
Malaysia
(External Examiner)

NOR AINI AB. SHUKOR, PhD
Professor and Deputy Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 28 June 2018

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

Norhasmah binti Sulaiman, PhD
Associate professor
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Chairman)

Zalilah binti Mohd Shariff, PhD
Professor
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Member)

Zuriati binti Ibrahim, PhD
Senior lecturer
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Member)

ROBIAH BINTI YUNUS, PhD
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

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Name and Matric No: Siti Farhana binti Mesbah (GS42334)

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Signature: _____
Name of Chairman of Supervisory Committee: Assoc prof Norhasmah Sulaiman

Signature: _____
Name of Member of Supervisory Committee: Prof Zalilah Mohd Shariff

Signature: _____
Name of Member of Supervisory Committee: Dr Zuriati Ibrahim

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LIST OF ABBREVIATIONS

CI	Confident Interval
ECAQ	Elderly Cognitive Assessment Questionnaire
EMS	Elderly Mobility Scale
EPU	Economic Planning Unit
EPF	Employees Provident Fund
FAO	Food and Agriculture Organization
FSSM	Food Security Status Module
GLM	General Linear Model
GDS	Geriatric Depression Scale
GOHAI	Geriatric Oral Health Assessment Index
IADL	Instrumental Activities of Daily Living
IQR	Interquartile range
LSNS	Lubben Social Network Scale
MCSI	Malaysian Coping Strategy Instrument
NHMS	National Health and Morbidity Survey
NHANES	National Health and Nutrition Examination Survey
NCD	Non-communicable diseases
OR	Odds Ratio
PLI	Poverty Line Income
SD	Standard Deviation
SDGs	Sustainable Development Goals
UN	United Nation
UNICEF	United Nations International Children's Emergency Fund
USDA	United State Department of Agriculture
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Study Background

Most evolutionary biologists define ageing as age-progressive decline in physiological function that leads to the increase in mortality rate and decrease in reproductive rate (Flatt, 2012). Ageing is caused by the accumulation of molecular and cellular damage over time. It leads to the gradual decrease in physical and mental capacity, growing risk of disease, and ultimately death (World Health Organization [WHO], 2015). Besides, Magalhaes (2013) described ageing as being characterised by height reduction, weight loss, muscle and bone loss, decline in metabolic rate and memory functions, decline in kidney functions, decline in pulmonary and immune functions, changes in multiple endocrines, and decline in audition, olfaction, and vision functions.

Initially, there was no general agreement of the age at which a person is classified as old (WHO, 2014). Based on the African standard, the cut-off age for older people is 50 because many individuals in Africa do not have official records of their birth date (WHO, 2014). Meanwhile, based on the developed nation standard, the United Nations (2012) reported that the age of 65 is a reference point for older person. This is because persons at this age become eligible to receive old-age social security benefits such as retirement pension. Furthermore, developed nations' residents attain better education level, economic level, health status, and longer life expectancy compared with residents of the developing nations. Nevertheless, the United Nations (UN) agreed that the age of 60 years be used as a cutoff age for older persons worldwide. In line with the cutoff suggested by the UN, the age of 60 years and over is used to refer to older persons in Malaysia.

On top of that, there are three phases to categorise an older person whereby "Old-Young" refers to those aged 65 to 74 years, while "Middle-Old" and "Old-Old" refer to those aged 75 to 84 years and 85 years old and over respectively (Public Service Department of Malaysia, 2014). The proportions of the older persons in the "Middle-Old" and "Old-Old" are expected to increase over the years. It has been reported that in 2010-2015, life expectancy of people in developed countries and developing countries were 78 years and 68 years respectively. By 2045 to 2050, newborns in developed countries are expected to live up to 83 years and newborns in developing countries are expected to live up to 74 years (United Nations, 2012).

Nutrition has emerged as an important factor in the rate of ageing. Lack of access to nutritious foods may lead to earlier onset of ageing symptoms (Food Security & Agriculture Cluster, 2013). Further, limited access to adequate and safe foods put the elderly at risk for poor nutrition. Recently, the United Nations (2016) suggested that the second goal of Sustainable Development Goals (SDGs) 2016, which is zero hunger could be achieved by improving food insecurity and promoting sustainable agriculture. In addition, everyone including poor and vulnerable people will have access to safe, nutritious, and sufficient food all year by 2030. Elderly have high vulnerability towards food insecurity (Food Security & Agriculture Cluster, 2013). Food insecurity exists whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain (Life Sciences Research Office, 1990).

Previous abroad and local studies have reported the prevalence of food insecurity among the elderly. Prevalence of food insecurity among American elderly was 24.0% (Wang et al., 2015). Besides, Russell, Flood, Yeatman and Mitchell (2014) have reported that the prevalence of food insecurity among older Australians was 13.0%. Meanwhile, Dean et al. (2011) found that the prevalence of food insecurity among older adults in Texas, the United States was 18.6%. In Malaysia, a recent study conducted by Nurzetty Sofia et al. (2017) and Rohida et al. (2017) reported that the prevalence of food insecurity among the elderly were 6.9% and 27.7% respectively. Based on the literature, it has been noted that about one third of the elderly population experienced food insecurity. Therefore, serious attention needs to pay on the food insecurity among the elderly.

1.2 Problem Statement

Globally, the population aged 60 years or above is growing at a faster rate than the population in other age groups due to the declining fertility rate, low infant mortality, and increasing survival of older age. The proportion of the world's population aged 60 years and above is estimated to double from 11% in 2000 to 22% in 2050. Meanwhile, in Asia region, about 11% of the total population were people aged 60 years and over in 2012, and it is expected to increase up to 24% in 2050 (United Nations, 2012). In Malaysia, the proportion of the elderly increased from 5.6% in 2014 to 6.0% in 2016 (Department of Statistics, 2017). The increasing trend of the elderly worldwide has received considerable critical attention in many aspects.

Along with the growth of the ageing population, there is increasing concern over the health of the elderly. Self-reported health complaints such as pain, mobility impairment, and fatigue predict low overall and health-related quality of life (Borglin et al., 2005). In many developed countries, rising health-care costs are major issues related to the ageing population. The average amount spent on medical care for senior citizens in United States is around USD 25 000 annually (Lauren, 2016). Meanwhile, for many developing countries, double burden costs occur as costs related to infectious diseases and non-communicable diseases are rising simultaneously and getting worse

with the increasing demand for healthcare and long-term care among the elderly (United Nation, 2012).

Previous studies have suggested that malnutrition exacerbates the health condition of the elderly by decreasing the resistance to infection and extending hospital stays (Barker, Gout & Crowe, 2011). Basically, food insecurity is related to malnutrition (Hall & Brown, 2005; Simsek et al., 2013). It has been proven by the study conducted by Davison and Kaplan (2015), who found that a food-insecure person has lower median carbohydrate as compared to a food-secure person. Similarly, Na et al. (2016) reported that the food-insecure group has lower consumption of fruits and vegetables than the food-secure group. In addition, a food-insecure person is more likely to report poor or fair health status rather than a food secure person (Gundersen & Ziliak, 2015; Seligman et al., 2010). Therefore, adequate, safe, and nutritious foods play a crucial role in maintaining optimal health among the elderly.

Several studies have documented the factors associated with food insecurity. Majority of the previous studies reported low income as the main predictor of food insecurity among elderly include study done by Wang et al. (2015). Nevertheless, there are some important gaps detected. The measurement of food insecurity in that study captured only one component of food insecurity namely anxiety about the food supplies. Besides, many abroad studies suggested an association between food security and oral health status among children (Chi et al., 2014; Santin et al., 2016). Currently, no existing research has discovered direct association between oral health status and food security status among the elderly. The mechanism of an association between poor oral health and food security status among the elderly remains unclear.

Besides that, low social support was found to have association with food insecurity among abroad elderly (Dean, et al., 2011; Kimokoti & Hamer, 2008). Yet, both local studies done on food insecurity did not assess the social support among the elderly. Further, functional status contributed towards food security status among the elderly (Brewer et al., 2010; Chung et al., 2012). However, the measurements of the functional status in the previous studies include only the instrumental activity daily living. Lack of studies captured the contribution of other functional status components namely cognitive status (Gao et al., 2009), mobility status (Ishikawa et al., 2016) and handgrip strength towards food security status. Therefore, it is important to assess an association between social support status, oral health status, functional status and food security status among the elderly in the current study.

Previous studies suggested several consequences of the food insecurity. Numerous studies have examined an association between food security status and nutritional status among the elderly (Lee & Frongillo, 2001; Nurzetty Sofea et al., 2017; Ziliak & Gundersen, 2015). Several studies also documented the contribution of food insecurity towards depression. Nevertheless, most of those studies were carried out among adults (Tsai et al., 2012; Weaver & Hadley, 2009). Only a few studies were done on food insecurity and depression among the elderly (German et al., 2011; Kim & Frongillo., 2007). Additionally, depression is a common mental health problem among the elderly

and commonly being overlooked. Therefore, depression is one of the variables included in the current study.

In Malaysia, little is understood about food insecurity among the elderly. To-date, there are only two published research on food insecurity among the elderly in Malaysia (Nurzetty Sofia et al., 2017; Rohida et al., 2017), and more local studies are needed to support the findings of existing research. Therefore, this study is important to determine the contributing factors towards food insecurity and its association on depression symptoms among the elderly in selected villages in Petaling district, Selangor.

1.3 Research Questions

There are three research questions in this study, namely:

1. What is the prevalence of food insecurity among the elderly in selected villages in Petaling district, Selangor?
2. What are the factors (demographic and socioeconomic background, oral health status, social support status, number of self-reported chronic diseases, and functional status) associated with food security status among the respondents?
3. Is there any difference in depressive symptoms based on the food security status among the respondents?

1.4 Objective of the Study

1.4.1 General Objective

To determine the factors associated with food insecurity and its association with depressive symptoms among free-living elderly in selected villages in Petaling district, Selangor.

1.4.2 Specific objectives

The specific objectives of this study are to:

1. Determine the demographic and socioeconomic background, oral health status, social support status, number of self-reported chronic diseases, functional status, and depression status among the respondents.
2. Determine the prevalence of food insecurity among the elderly in selected villages in Petaling district, Selangor.

3. Determine an association between demographic and socioeconomic background, oral health status, social support status, number of self-reported chronic diseases, and functional status with food security status among the respondents.
4. Determine the factors (demographic and socioeconomic background, oral health status, social support status, number of self-reported chronic diseases, and functional status) associated with food security status among the respondents.
5. Determine the difference in depressive symptoms based on food security status after controlling for covariates.

1.5 Null Hypothesis

H_o 1: There is no significant association between demographic, socioeconomic background, oral health status, social support status, number of self-reported chronic diseases, and functional status with food security status among the respondents.
H_o 2: There is no significant factor associated with food security status among the respondents.
H_o 3: There is no significant difference in depressive symptoms between food security status groups after controlling for covariates.

1.6 Significances of the Study

This study is important because Malaysia is currently moving towards an ageing population and food insecurity is a major public health problem especially among the vulnerable groups such as the elderly. Since there is a lack of studies done on food insecurity among the elderly in Malaysia, findings from this study are important to provide baseline data, such as the prevalence of food insecurity among the elderly. In addition, useful information regarding factors associated with food insecurity and the consequence of food insecurity among Malaysian elderly can be determined. Therefore, this study can be used as a reference for future study on food insecurity among the elderly or in other related studies.

Further, the significant factors and the consequences of food insecurity can be used as evidence for healthcare professionals and health policy makers to advocate healthy ageing programme, increase the social healthcare workforce, and prepare nutrition guidelines for the elderly. Therefore, the factors associated with food insecurity can be overcome and the consequences of food insecurity among the elderly can be minimised. Finally, it is hoped that this study can increase the awareness among the surrounding communities such as welfare bodies and the society to take good care of their old parents, help to reduce the economic burden among the elderly, stay around their old parents, and help them to carry out daily living activities.

1.7 Conceptual and Research Framework of the Study

Research framework of this study (Figure 1.2) was adapted from the Campbell (1991) framework (Figure 1.1). Campbell was the pioneer of the food insecurity framework. Most research framework in the previous studies was emerged from the Campbell framework (Lee & Frongillo, 2001; Quine & Morrell, 2006). Basically, Campbell framework conceptualized the risk factors and consequences of food insecurity. Risk factors refer to any reason that limits food acquisition such as time and money. Besides, potential consequences of food insecurity were quality of life, nutritional and health status. Further, food insecurity had direct effect on nutritional status, health status and quality of life. Food insecurity also can had an indirect effect on health status and quality of life through physiological mechanism of nutritional status. Based on this framework, food insecurity was dependent variable of the risk factors and independent variable of the consequences.

Likewise, research framework (Figure 1.2) also proposed the risk factors and consequence of food security status. Based on the literature, demographic and socioeconomic background (Russell et al., 2014), social support (Markwick et al., 2014), and number of chronic disease (Tarasuk et al., 2013) were the risk factors of food security status. For potential consequence, quality of life includes the physical and mental components, whereby the physical (functional status) and mental (depressive symptom) were measured in the current study. Nonethelss, among elderly population functional status was demonstrated as risk factor of food security status (Oemichen & Smith, 2016). Meanwhile, depressive symptom was demonstrated as dependent variable of food security status (Wang et al., 2015). However, not all variables in the Campbell framework (1991) were measured in the current study. Nutritional status was not included as dependent variable of food insecurity as huge studies have grown on food security and nutritional status (Alvares & Amaral., 2014; Nurzetty Sofia et al., 2017; Simsek et al., 2013).

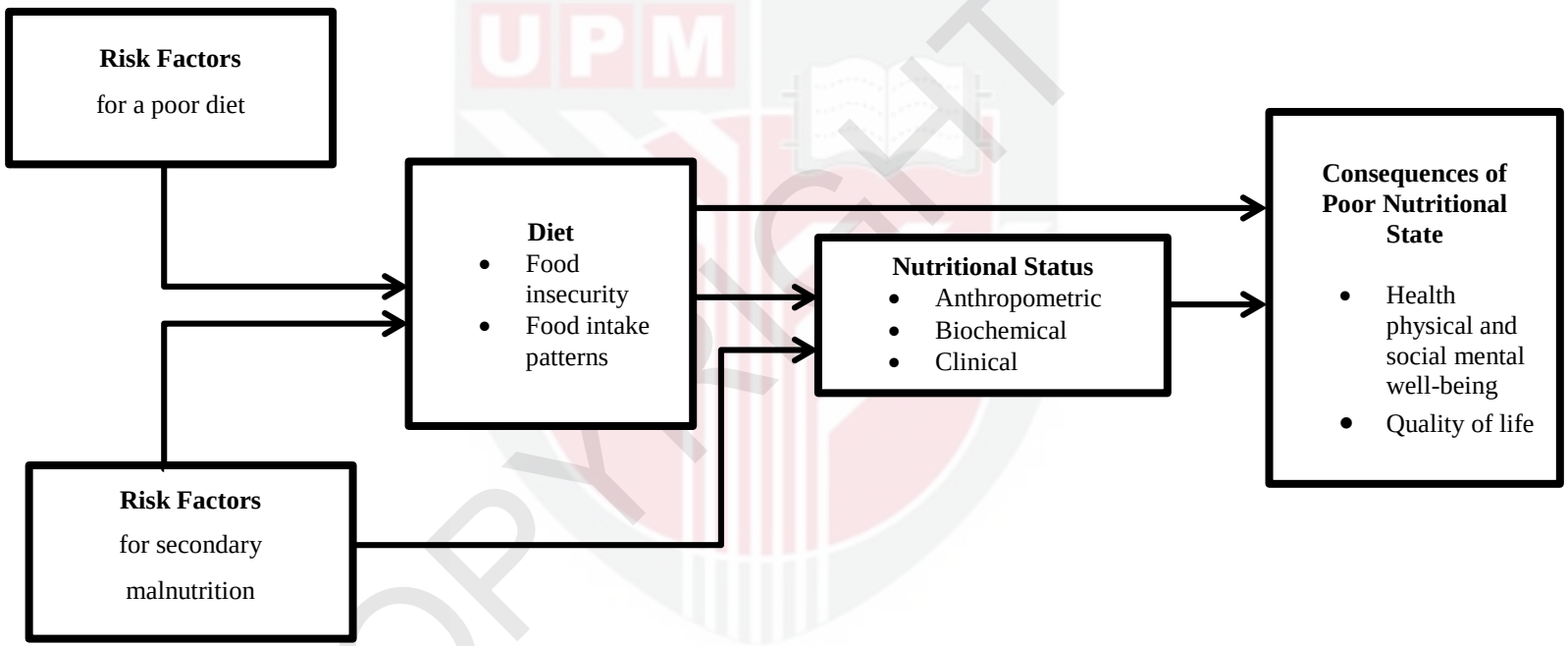

Figure 1.1: Campbell Framework (1991) for Food Insecurity

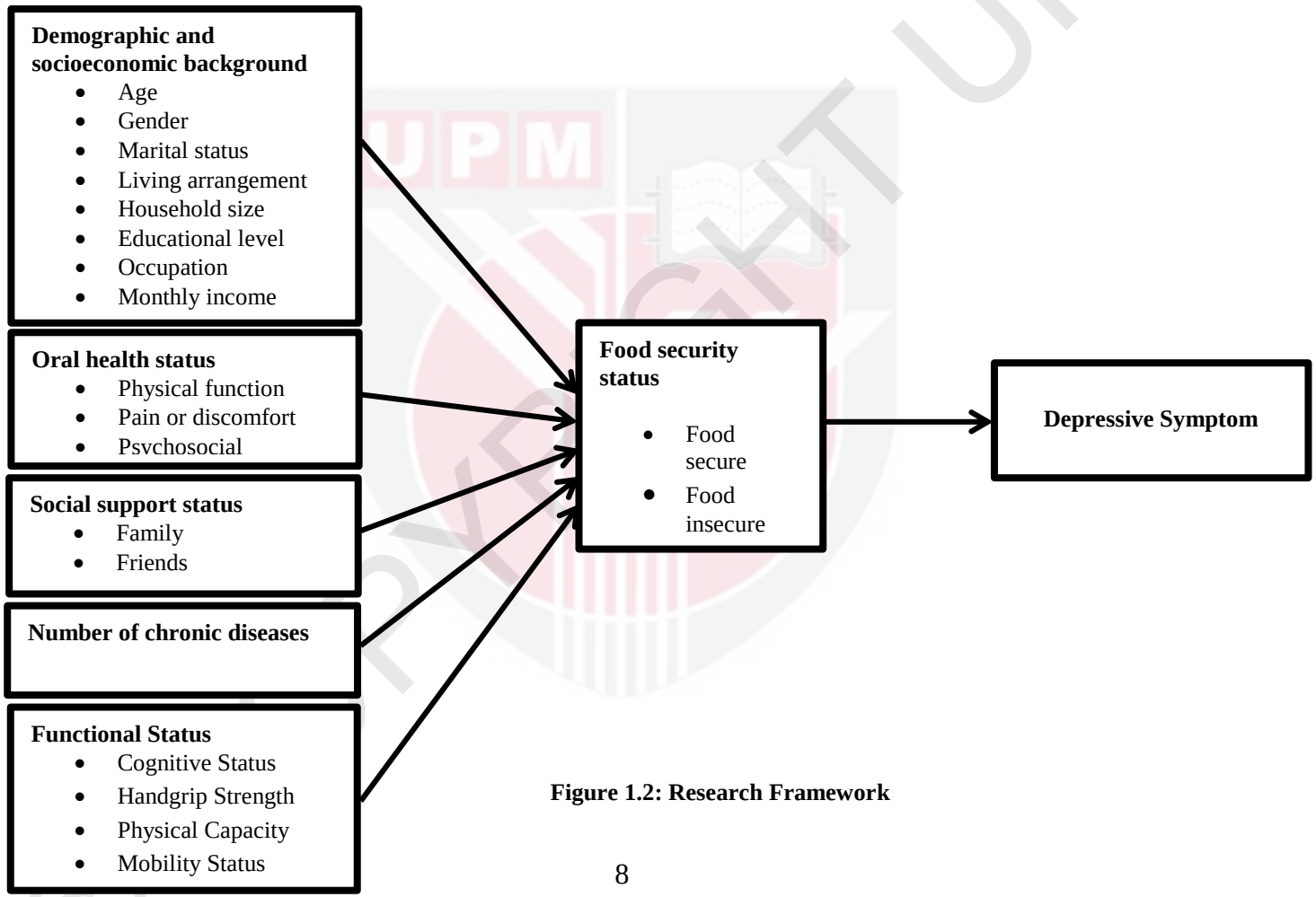

Figure 1.2: Research Framework

1.8 Conceptual and Operational Definition

1.8.1 Demographic and Socioeconomic Background

Conceptual definition: Characteristics of a population expressed statistically.

Operational definition: Characteristics of the respondents that involves in this study are age, gender, marital status, living arrangement, household size, educational level, occupation status and monthly income.

1.8.2 Oral Health

Conceptual definition: State of being free from mouth and facial pain, oral and throat cancer, oral infection, gum disease, tooth decay, tooth loss, and diseases that limit an individual's ability in eating, speaking, and psychosocial well-being (WHO, 2012).

Operational definition: In this study, oral health consists of three components: physical function (bite, chew, swallow), pain or oral discomfort (pain and medication intake), and psychosocial related to oral (teeth appearance and social contacts).

1.8.3 Social Support Status

Conceptual definition: Social support involves the provision of love, care, trust, material support, advices or suggestions to solve problems and improve the ability to cope with stress (Interlenghi & Salles-Costa, 2014).

Operational definition: Social support status in this study is based on the number of family and friends contact by respondents, number of family members and friends to share personal matters and seek help if any.

1.8.4 Chronic Disease

Conceptual definition: Chronic disease is not passed from a person to another. It is long duration and generally slows in progression (WHO, n.d)

Operational definition: Chronic diseases reported are collected and group based on the number of chronic diseases.

1.8.5 Functional Status

Conceptual definition: Individual's ability to perform daily activities required to meet basic needs, usual roles, and maintain health and well-being (Leidy, 1994).

Operational definition: Functional status in this study comprises the upper (cognitive status, handgrip strength) and lower body parts (physical capacity and mobility status).

1.8.6 Food Security Status

Conceptual definition: Having access at all times to enough food for an active and healthy lifestyle (Anderson, 1990).

Operational definition: In this study, food security status is measured at individual level and based on the four components of food insecurity namely quantity, quality, psychological and social acceptability.

1.8.7 Depressive Symptoms

Conceptual definition: Depression is characterised by persistent sadness, accompanied by disturbance in daily living activities and may lead to suicide (WHO, 2017).

Operational definition: Depression covers the depressive symptoms listed in the Geriatric Depression Scale (GDS-15). Presence of more than four depressive symptoms indicates some degree of depression status.

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