UNIVERSITI PUTRA MALAYSIA

ASSOCIATION BETWEEN SELECTED GERIATRIC SYNDROMES WITH FRAILTY AMONG ELDERLY IN PPR FLATS KUALA LUMPUR, MALAYSIA

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A project submitted as partial fulfillment of the requirement for the degree of Bachelor of Science (Nutrition and Community Health) from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

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By

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Frailty syndrome is defined as a clinically recognizable condition of older adults with greater vulnerability. Geriatric syndrome presence has been hypothesized that may play important role in the development of frailty in older adults. The purpose of this study is to determine the relationship between selected geriatric syndromes and frailty syndrome among the Malaysian elderly in PPR flats Kuala Lumpur. A cross-sectional study was conducted among 160 elderlies (aged $\geq$60) which were randomly recruited in this study. Demographic and socioeconomic variables, health related variables, selected geriatric syndromes (depressive symptoms, mobility limitation, cognitive impairment, polypharmacy, malnutrition, falls and urinary incontinence), and frailty status were analysed. Chi-square analysis was used to determine the factors associated with frailty. The prevalence of frailty and pre-frail was 18.1% and 77.5% with the frail score increasing with age. There are no significant differences was observed between gender (x^2 =8.34, P=0.147). However, females showed a higher proportion of having frail 21.1% compared to male 13.8%. Health related variables that were only significantly associated with frailty syndrome was arthritis /gout (F=0.044, $p<0.05$) Among all tested geriatric syndrome only depressive symptoms showed significant association with the frailty syndrome (x^2 = 4.494, $p<0.05$). This study shows that there is a significant association between depressive symptoms and arthritis /gout with frailty status among older adult. The findings of this study highlight that depressive symptoms and arthritis /gout could have influence on frailty status. Understanding the relationship between geriatric syndrome and frailty status help to reduce the risk of the frailty syndrome among elderly.

HUBUNGAN ANTARA SINDROM GERIATRIK DAN SINDROM KELEMAHAN DALAM KALANGAN WARGA TUA MALAYSIA DI FLAT PPR SEKITAR KUALA LUMPUR

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Sindrom kelemahan ditakrifkan sebagai keadaan yang dapat dikenalpasti secara klinikal yang terjadi pada orang dewasa yang lebih tua. Kehadiran sindrom geriatrik telah menjadi hipotesis dan memainkan peranan penting dalam perkembahgan kelemahan pada usia yang lebih tua. Tujuan kajian ini adalah untuk mengenalpasti hubungan antara sindrom geriatrik dan sindrom kelemahan yang terpilih dalam kalangan warga tua di Malaysia di flat PPR sekitar Kuala Lumpur. Satu kajian tinjau selidik keratan rentas telah dijalankan kepada 160 orang warga tua (berumur >60) dimana mereka telah dipilih secara rawak dalam kajian ini. Maklumat demografi dan sosioekonomi, status kesihatan dan beberapa sindrom geriatrik terpilih (symptom kemurugan, had pergerakan, kegagalan kognitif, polifarmasi, malpemakanan, risiko untuk jatuh dan pembuangan air kecil tidak lawas), serta status kelemahan telah dianalisia. Analisis *Chi-square* digunakan untuk menentukan faktor yang berkaitan dengan kelemahan. Prevalens kelemahan dan pra lemah masing-masing adalah 18.1% dan 77.5% dengan skor kelemahan yang meningkat Bersama peningkatann usia. Kajian ini juga mendapati bahawa, tiada perbezaan yang ketara antara jantina ($x2=8.34$, $P=0.147$). Walaubagaimanapun, perempuan menunjukkan kadar yang tinggi mengalami kelemahan iaitu sebanyak 21.1% berbanding lelaki 13.8%. Pemboleh ubah berkaitan kesihatan yang didapati mempunyai hubungan yang signifikan dengan sindrom kelemahan adalah arthritis/gout ($F=0.044, p<0.05$). Bagi semua sindrom geriatric yang dikaji, hanya gejala kemurungan sahaja yang menunjukkan hubungan yang signifikan dengan sindrom kelemahan ($x2=4.494, p<0.05$). Kajian ini menunjukkan bahawa terdapat hubungan yang signifikan antara gejala kemurungan dan arthritis/gout dengan status kelemahan dalam kalangan warga tua. Hasil dapatan kajian ini menunjukkan bahawa gejala kemurungan dan arthritis/gout boleh mempengaruhi status kelemahan individu. Dengan memahami hubungan antara Sindrom geriatrik Dan status kelemahan, ia dapat membantu dalam mengurangkan risiko memperoleh Sindrom kelemahan dalam kalangan orang Tua.

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

Population aging is an unpreventable and expected global phenomenon that is changing society in an accelerated and complex manner, specifically in less developed countries. The percentage of elderly aged 65 and above of the world's population in 2015 is 8.5% and by 2050 is expected to reach 1.6 billion, representing 16.7% of the World's total population (An Aging World, 2015). In Malaysia there is an increase in the percentage of older people aged 60 years and above due to considerable socioeconomic and demographic transmutation. By the year 2020, Malaysia is expected to change an aging population, with older adults making up 7.2% of the total population (Department of statistics Malaysia, 2016).

Increase ageing population in Malaysia which will increase the prevalence of frailty. Frailty is defined as a clinically recognizable condition of older adults with greater vulnerability, resulting from age-associated decrease in physiologic reserve and function across various organ systems, such that the ability to cope with every day or acute stress are compromised (Fried et al., 2005; Lipsitz, 2002; Lipsitz& Goldberger, 1992). The frailty prevalence rates worldwide reported from the range 4.0–59·1% in community dwelling- older adult. In studies that used a frailty definition according to physical phenotype, frailty prevalence ranged from 4.0% to 17.0%. The prevalence diverse from 4.2% to 59.1% in studies that used broad definitions or measurement assessments (Collard, Boter, Schoevers, & Oude Voshaar, 2012).

The prevalence of frailty in older adult in Malaysia reported in a study was 18.3% (Fairus Asma et al., 2018). The prevalence in this study is higher than previous studies conducted in Malaysia that the overall average prevalence of frailty was 10.7% (Collard, Boter, Schoevers, & Oude Voshaar, 2012). In other study conducted in Malaysia, the prevalence of frailty in this study was 5.7%, and 61.8% of the respondents were prefrail (Sathasivam, Kamaruzzaman, Hairi, Ng, & Chinna, 2015). The prevalence of frailty is difficult to accurately estimate between various studies due to the differences in geography, study design, age, gender, characterization of participants and heterogeneous of frailty phenotype implementation (Syddall et al., 2009). The prevalence increased steadily with age and slightly higher for women than men. Many studies reported that frail people are at higher risk of falls, functional decline, disability, dependence, and institutionalization (Serra-Prat et al., 2016).

Geriatric syndrome presence has been hypothesized that may play important role in the development of frailty in older adults(Tkacheva et al., 2018).Geriatric syndrome is a clinical condition that highly prevalent in older adults which does not fit into a discrete disease category and characterized by multiple causes determining a unified manifestation(Kuchel, 2008).For many years the geriatric syndrome such as pressure ulcers, falls, incontinence and delirium has been reported in the literature(Tinetti, Inouye, Gill, & Doucette, 1995; Kuchel, 2008).The other geriatric conditions also included such functional and cognitive impairment, affective disorders, visual and hearing problems, self-neglect and elder abuse, malnutrition, eating and feeding problems, sleep problems, and even dizziness and syncope (Senn & Monod, 2015).

The scientific literature has reported that frailty syndrome is associated with some socioeconomic conditions. National research has reported that older age, being single and low education are related to frailty among community elderly (Moreira & Lourenco, 2013). Understanding frailty and associated factors in this group is important to develop interventions that may decrease burden in this rapidly growing population(Lee, Kawas, Gibbs, & Corrada,

2016). Understanding frailty can also assist in the management of elderly people treated in primary care, prevent and reverse cognitive decline and the interconnected phenomena (Closs, Ziegelmann, Gomes, & Schwanke, 2016). Thus, the aim of this study was to investigate the association of the frailty status with generic syndromes, sociodemographic and health variables among older adults in community-dwelling Kuala Lumpur.

1.2 Problem statement

Frailty is considered one of the widely complex and essential problems associated with human ageing, with significant implications for both patient results and healthcare service utilisation (Sutton et al., 2016). The consequences of frail people that they are risk of many various results in short and long duration which could be related to a lack of physiological reserve. Also, the likelihood of a frail individual decreases the capacity to cope, leading to a reduction in health and function, with consequences for health facilities and the welfare of an individual (Conroy & Elliott, 2017).

In addition, the frailty syndrome and associated factors are not clearly understood, which is very essential to be able to plan and implement for this target group. By fully understanding the associated factors can prevent many health conditions at the primary care level as long the healthcare professionals are alerted to the determinant factors for the syndrome and awareness of the importance of early detection (Mello, Engstrom, & Alves, 2014). Furthermore, limited studies have been conducted in Malaysia to determine the association of geriatric syndromes and frailty status in elderly which is not further discussed in different settings and factors (Badrasawi, Shahar, & Kaur Ajit Singh, 2017; Mohd Hamidin, Adznam, Ibrahim, Chan, & Abdul Aziz, 2018; Asma, 2018). Frailty happens more often in developing countries which found limited studies of frailty in developing countries (Nguyen, Cumming, & Hilmer, 2015). Therefore, further studies are needed to identify the relationships between frailty and geriatric

syndrome in Malaysia which will help to prevent elderly in developing frailty at an early stage by planning and implementing intervention programs.

1.3 Significance of the study

This study can help to contribute to expand knowledge about sociodemographic, health status and geriatric syndrome related to frailty among elderly aged 60 years and over in the community. Besides that, this research will be useful for the future researchers, nutritionist and health care to arise more awareness about this issue through campaign and health promotion programs. Moreover, benefits the policymakers to plan and implement an effective intervention program for this target group.

1.4 Research questions

1. What is the prevalence of frailty syndrome among the respondents?

2. Is there association between sociodemographic factors, selected geriatric syndromes (depressive symptoms, functional status, cognitive impairment, polypharmacy, malnutrition, falls and urinary incontinence) and health status with frailty among respondents?

1.5 Research hypothesis

There is association between sociodemographic factors, selected geriatric syndromes (depressive symptoms, functional status, cognitive impairment, polypharmacy, malnutrition, falls and urinary incontinence) and health status with frailty among the respondents.

1.6 Objectives

General Objective:

The purpose of this study is to determine the association between selected geriatric syndromes, sociodemographic profile and health status with frailty syndrome and among Malaysian elderly in PPR flats Kuala Lumpur.

Specific Objectives:

a) To determine the sociodemographic profile, selected geriatric syndrome (depressive symptoms, mobility limitation, cognitive impairment, polypharmacy, malnutrition, falls and urinary incontinence), and health status among respondents.
b) To assess the prevalence of frailty syndrome among respondents using the Fried criteria.
c) To determine the association between sociodemographic profile, selected geriatric syndrome (depressive symptoms, mobility limitation, cognitive impairment, polypharmacy, malnutrition, falls and urinary incontinence) and health status with frailty syndrome among respondents.

1.7 Conceptual framework

This study aimed to determine the association of the selected geriatric syndrome with frailty among elderly in PPR flats Kuala Lumpur. **Figure 1.1** shows the conceptual framework of the study. The frailty status is dependent variable which is assessed through fried criteria based on the scores (weight loss, exhaustion, low physical activity, slowness and weakness). Whereas independent variables are sociodemographic, selected geriatric syndrome (depressive symptoms, functional status, cognitive impairment, polypharmacy, malnutrition, falls and

urinary incontinence) and health status. The sociodemographic and health status are evaluated by self-reported questionnaire and the selected geriatric syndrome for every condition are assessed in different instruments which will be further explained in the research instrument section. In addition, the relationship between sociodemographic factors with frailty shows that age, women, single and low education have higher risk of frailty(Etman, Burdorf, Van der Cammen, Mackenbach, & Van Lenthe, 2012; Moreira & Lourenco, 2013; Hsu & Chang, 2015; Eyigor et al., 2015; Serra-Prat et al., 2016; Ko & Choi, 2017; Carneiro et al., 2017; Dos Santos Tavares, de Freitas Corrêa, Dias, Dos Santos Ferreira, & Sousa Pegorari, 2017; De Labra et al., 2018; Fhon et al., 2018). Moreover, there are association between depressive symptoms, functional status, cognitive impairment, polypharmacy, malnutrition and falls with frailty based on the studies (Moreira & Lourenco, 2013; Serra-Prat et al., 2016; Eyigor et al., 2015; Closs, Ziegelmann, Gomes, & Schwanke, 2016; Carneiro et al., 2017). Furthermore, based on the previous studies reported that the chronic diseases and hospitalizations among elderly increase the risk of becoming frail (Moreira & Lourenco, 2013; Eyigor et al., 2015; Serra-Prat et al., 2016; Dos Santos Tavares, de Freitas Corrêa, Dias, Dos Santos Ferreira, & Sousa Pegorari, 2017; Carneiro et al., 2017).

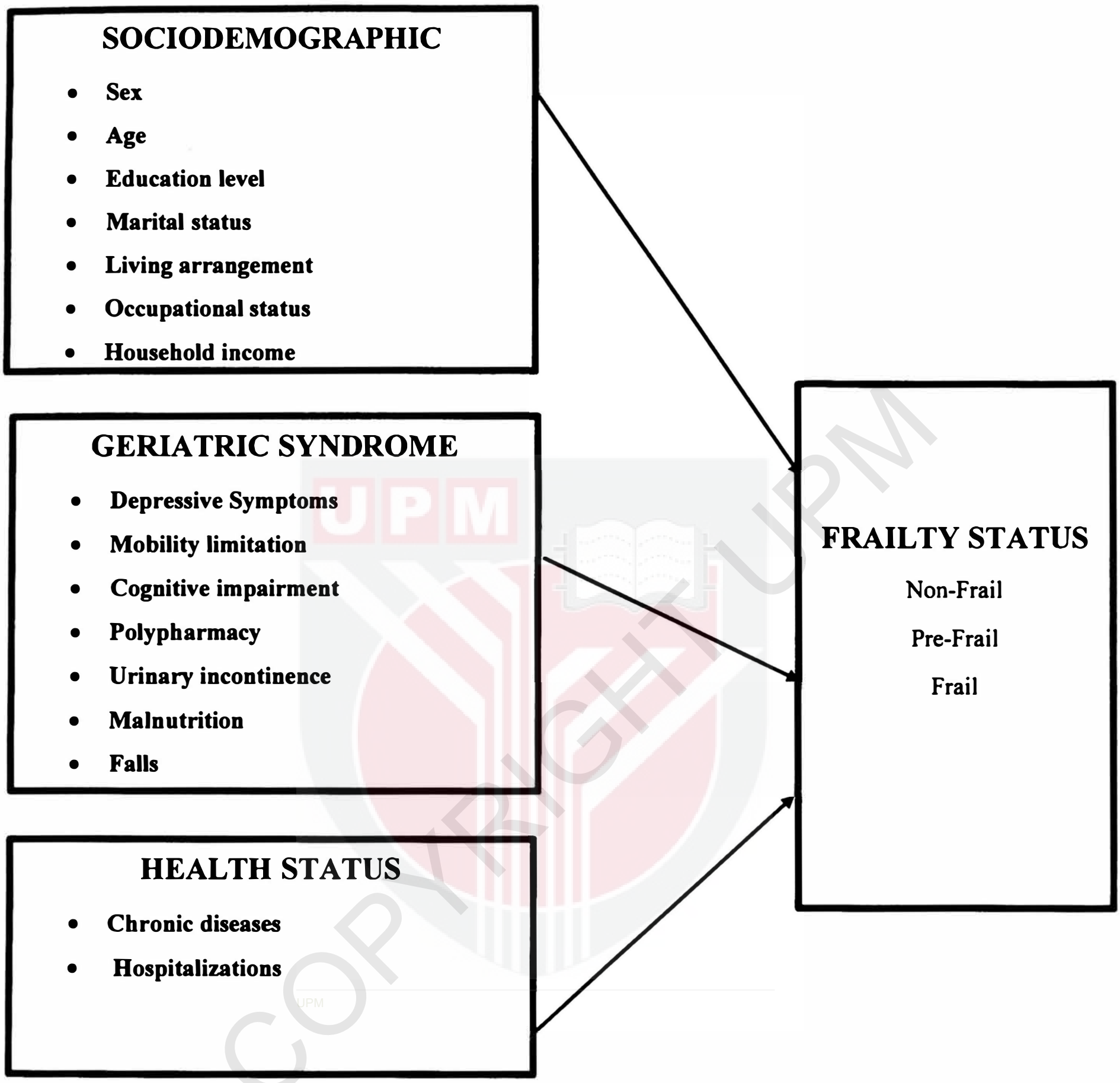


Figure1.1: Study conceptual framework

CHAPTER 2

LITERATURE REVIEW

2.1 Frailty syndrome

Frailty defined as a state of vulnerability to lack resolution of homeostasis when reveal to a stressor event as result of age-related cumulative deficits over several physiological systems(Clegg, Young, Iliffe, Rikkert, & Rockwood, 2013).Frailty is associated with different health conditions, including falls, hospitalization, institutionalization, fracture, disability, dementia, lower quality of life, and mortality (Fousek, 1965 ;Clegg, Young, Iliffe, Rikkert, & Rockwood, 2013; Kojima, Taniguchi, Iliffe, & Walters, 2016; Kojima, Iliffe, Jivraj, & Walters, 2016; Kojima, 2018).

The frailty phenotype proposed by Fried et al. is the most widely used definition of frailty which using data from the Cardiovascular Health Study. Frailty is defined as distinct clinical syndrome by using a set of five physical phenotypic components which are unintentional weight loss, exhaustion, weakness, slow walking speed, and low physical activity with an underlying biological basis. the individual is categized as frail, prefrail, and robust in Fried criteria when they meet >3, 1–2, and 0 of the components, respectively (Fried et al., 2001).

Frailty is an increasingly recognized syndrome resulting in age-related decrease in function and reserve across many physiologic systems. (Mohler, Fain, Wertheimer, Najafi, & Nikolich-Žugich, 2014). Increase in frailty result in higher risk of deaths, disability, falls and other various health problems associated with frailty (Clegg et al., 2013; Kojima, 2016). Thus, understanding the basic epidemiology of frailty among elderly is important for clinicians, researchers, and policymakers for further studies and prevention of frailty (Walston et al., 2006; Berrut et al., 2016)

2.2 **Prevalence of frailty syndrome**

According to WHO, frailty refer as crucial and complex issue among elderly people, typically related to dependence and long-term care requirements (WHO 2012). Frailty is highly prevalent among community-dwelling aged adults (Collard et al. 2012). The prevalence of frailty among elderly had been reported largely across the worldwide and number different because various assessments tools used to define and operationalize frailty, different geographical, study design, the range of age, gender, characteristic of respondents and the heterogeneity of Fried's frailty phenotype implementation (Syddall et al., 2006).

The prevalence of frailty was determined by investigators in a recent systematic review. The operational definitions for frailty and the inclusion or exclusion criteria different between the studies, which largely explained the importance difference in reported frailty prevalence range of values from 4·0–59·1% in previous studies. The variation between was also noted (Collard et al.2012). If we consider the large frailty prevalence ratios, prevention is more cost-effective than treatment and should be considered as the first line of defence. Early intervention and screening for frailty and its associated factors must be key concern (Bandeen-Roche et al. 2006; Xue et al. 2008).

In Malaysia, the prevalence of frailty reported in a study was 8.9%, which slightly higher compared to previous studies conducted in Malaysia among elder in urban areas (Badrasawi, Shahar, & Kaur Ajit Singh, 2017). Another study reported that the prevalence of frailty among older adult wad 18.3% (Mohd Hamidin, Adznam, Ibrahim, Chan, & Abdul Aziz, 2018). The findings in this study is higher than the studies that conducted previously in the systemic review of 21 studies which the average of the prevalence of frailty was 10.7% (Collard, Boter, Schoevers, & Oude Voshaar, 2012). And the differences in prevalence of frailty among Asian communities due to the differences in respondent's selection methods, sample size, frailty instruments, tools used, the cut-off points of physical function used and the age of the respondents (Badrasawi, Shahar, & Kaur Ajit Singh, 2017).

2.3 **Consequences of frailty syndrome**

Frailty is strongly correlated with adverse outcomes, including falls, disability, admission to hospital and death. In four prospective cohort studies these correlations have been described (Clegg et al, 2013). As frailty is a consequence of age-related decrease in many physiological systems, comprehension and identifying it is certainly going to become an increasingly essential aspect of health-care in the future, particularly given that approximately 25–50% of the population aged over 85 years have frailty (Clegg et al, 2013).Therefore, interventions programs are needed to decrease the prevalence and seriousness of frailty which important for the advance care planning, discussions of the risks and benefits of various interventions and prevention of potentially harmful treatments among the group with higher frailty (Abadir, 2011).

2.4 **Frailty syndrome and associated factors**

2.4.1 Sociodemographic

There are several studies highlighted that some sociodemographic factors are associated with the presence of frailty syndrome. National research has illustrated that among community elderly, being older age, single and low education are related to frailty(Moreira & Lourenco, 2013; Neri, 2013) A previous studies has reported that particularly age and female gender stand out as determining factors in frailty (Hsu & Chang, 2015; Eyigor et al., 2015; Serra-Prat et al., 2016; Dos Santos Tavares, de Freitas Corrêa, Dias, Dos Santos Ferreira, & Sousa Pegorari, 2017; Yu, Wu, Leung, Hu, & Woo, 2017; Ko & Choi, 2017; De Labra et al., 2018).There are studies found that there is association between marital status and frailty (Carneiro et al., 2017;Ko & Choi, 2017; Fhon et al., 2018);De Labra et al., 2018). Also, elderly with low education level have a higher likelihood of frailty (Etman, Burdorf, Van der Cammen, Mackenbach, & Van Lenthe, 2012; Moreira & Lourenco, 2013; Eyigor et al., 2015; Hsu & Chang, 2015; Serra-Prat et al., 2016).

2.4.2 Health status

There higher chances for adverse health conditions are associated with frailty in this population. Frailty has been associated with chronic diseases in many studies (Moreira & Lourenco, 2013; Eyigor et al., 2015; Serra-Prat et al., 2016; Dos Santos Tavares, de Freitas Corrêa, Dias, Dos Santos Ferreira, & Sousa Pegorari, 2017; Carneiro et al., 2017). The best example is cardiovascular disease, in which increased cardiac dysfunction is associated with greater probability of frailty (Newman et al., 2001; Woods et al., 2005; Chaves et al., 2005). Other chronic diseases such as stroke, diabetes, hypertension, arthritis, cancer, and chronic obstructive pulmonary disease that also could be used to predict frailty risk (Woods et al., 2005). According to Cardiovascular Health Study, Fried and colleagues reported that at least

25% of frail persons had at least one chronic disease, 25% hypertension, 8% diabetes, and less than 5% each of angina, congestive heart failure, cancer, and pulmonary disease (Fried et al., 2001).

2.4.3 Geriatric syndrome

Geriatric syndrome defined as clinical manifestations observed among older adults that cannot be classified as a single disease, such as frailty, sarcopenia, gait instability, malnutrition, inability to move, and cognitive impairment (Ahmed, Mandel, & Fain, 2007; Chang & Lin, 2016). Geriatric syndrome is higher prevalent among elderly, particularly the frail older adult (Inouye et al., 2007). Geriatric syndrome and frailty consider as severe conditions for elderly and may have a negative effect on health and functional capacity, and their impact on disability and quality of life are important (Fried et al., 2001; Inouye et al., 2007; Isaacs, 1969). There is higher probability of the elderly becoming frail as the number of GS accumulate. Frail elders also have a greater risk of progressing other geriatric syndromes. Identifying the relationship between geriatric syndrome and frailty help in intervention to prevent development of GS that may lead elderly persons to a greater risk of frailty (Closs, Ziegelmann, Gomes, & Schwanke, 2016).

Previous findings have reported that depressive symptoms are associated with frailty (Feng, Nyunt, Feng, Yap, & Ng, 2014; Hsu & Chang, 2015; Serra-Prat et al., 2016; Monin et al., 2016; Dos Santos Tavares, de Freitas Corrêa, Dias, Dos Santos Ferreira, & Sousa Pegorari, 2017; Carneiro et al., 2017; Ko & Choi, 2017). The second geriatric syndrome also associated with frailty is polypharmacy (Eyigor et al., 2015; Serra-Prat et al., 2016; Closs, Ziegelmann, Gomes, & Schwanke, 2016; Veronese et al., 2017; Bonaga et al., 2018; Rieckert et al., 2018). Cognitive impairment was the third most frequent geriatric syndrome among frail elderly (Macuco et al.,

2012; Moreira & Lourenco, 2013; Hsu & Chang, 2015; Closs, Ziegelmann, Gomes, & Schwanke, 2016).

Functional status was also reported in several studies is associated with frailty among older adult (Moreira & Lourenco, 2013; Dos Santos Tavares, de Freitas Corrêa, Dias, Dos Santos Ferreira, & Sousa Pegorari, 2017; Fhon et al., 2018). Urinary incontinence reported increase the risk of becoming frailty among elderly (Berardelli et al., 2013; Closs, Ziegelmann, Gomes, & Schwanke, 2016; Wang et al., 2017; Kang & Kim, 2018). The geriatric syndrome such as malnutrition and falls play important role among frail elderly (Chang, 2017).

Others geriatric syndrome and their relationship with frailty, hearing impairment is associated with prefrailty and frailty among older age and poor hearing have higher risk of becoming frail in the next 4 years (Liljas et al., 2017). Besides that, visual impairment is independently correlated with frailty in a study to determine the visual ability among healthy community dwelling elderly people and explore the association between visual ability and frailty(Miu Ka Ying, 2018). Other than that, a study reported that osteoporosis is associated with frailty among community-dwelling people 50 years of age and older(Liu et al., 2015). Moreover, higher levels of frailty are independently correlated with higher risk of dementia (Rogers, Steptoe, & Cadar, 2017).

2.5 Assessment tools to identify frailty:

There are many assessment tools to identify frail older people has been developed such as the frailty phenotype (FP), also known as Fried's definition or Cardiovascular Health Study (CHS) definition, and the frailty index (FI), FRAIL (Fatigue, Resistance, Ambulation, Illnesses, Loss of weight) (International Academy of Nutrition and Aging) and The Clinical Frailty Scale (CFS) is frailty measurement that originated from Dalhousie University in Canada.

The Fried Criteria was proposed by Fried et al defined as geriatric syndrome. And Fried et al is conducted in the CHS, huge cohort study of more than community-dwelling older male and female in the united states. Frailty is considered as a syndrome meeting 3 or more of the five criteria: weakness, slowness, low level of physical activity, low energy or self-reported exhaustion, and unintentional weight loss (Fried et al., 2001). The frailty index (FI) is based on a comprehensive geriatric assessment which is developed by Rockwood et al. The FI is counting the number of deficits accumulated, including diseases, physical and cognitive impairments, psychosocial risk factors, and common geriatric syndromes other than frailty (Chen, Mao, & Leng, 2014). FRAIL is recognized to be clinically advantageous due to its simple nature and ability to be obtained from data already included in a patient (Dent, Kowal, & Hoogendijk, 2016). CSF is based on a clinical assessment in mobility, energy, physical activity and function. The scale uses descriptors, icons and figures to stratify older adults according to their level of vulnerability and the score between 1 (robust health) to 7 (complete functional dependence on others). The CFS has been validated as an adverse outcome predictor in hospitalised older people (Dent, Kowal, & Hoogendijk, 2016).

The Measurement for frailty, there is no golden standard measurement and there are many of frailty measurement already exist which make it difficult to select which frailty assessment to

use. Besides that, frailty instruments range from short, fast and crude frailty screening instruments to sophisticated, time-consuming measurements (Dent, Kowal, & Hoogendijk, 2016). Many assessment tools have been illustrated to determine frailty. Among all the instruments, the frailty criteria is the most widely used tool in the literature reviews(Alonso Bouzón et al., 2017).The Fried criteria is used to assess frailty among elderly and this assessment tool has been validated and used to asses frailty associated with different health conditions and results in most of the studies (Lee et al., 2017).The Fried criteria uses 5 criteria to assess the level of frailty: weight loss, exhaustion, low physical activity, slowness, and weakness. The weight loss, exhaustion and low physical activity are measured with self-report questions, while slowness and weakness are assessed with the performance-based measures of walk time and handgrip strength (Op het Veld et al., 2018).

CHAPTER 3

METHODOLOGY

3.1 Study design

This is a cross-sectional study that aim to assess the association of selected geriatric syndrome with frailty among elderly in Program Perumahan Rakyat (PPR) flats Kuala Lumpur, Malaysia. PPR is selected as for this study because poor socioeconomic found in frail elderly.

3.2 Study location

The study was conducted at Program Perumahan Rakyat (PPR), located in Kuala Lumpur. PPR is a drastic action taken by the Malaysian government to address the problem of housing shortages and squatter problems through the National Economic Action Council (MTEN). PPR is implemented by Syarikat Perumahan Negara Berhad (SPNB) in collaboration with local governments. Construction costs are borne by the Federal Government, but land is provided by the state government.

3.3 Sampling method

3.3.1 Sample size calculation

Sample size calculation was done using the formula of proportionate sampling:

The sample size was calculated using an adapted formula to have a sufficient number of observations to estimate the differences in proportions. The standard errors of the proportions for both groups (P1 and P2) must be taken into account when estimating the sample size required to estimate differences in proportions. Then the sample size is obtained with this formula below:

$$n = \frac{\{(z_{(1-\alpha/2)} * \sqrt{2P\,(1-P)} + [\,z_{(1-\beta)} * \sqrt{(P_1(1-P_1) + P_2(1-P_2)}]\}^2}{(P_1 - P_2)^2}$$

Where:

$P = (p1 + p2)/2$

P_1 = estimate proportion for group 1

P_2 = estimated proportion for group 2

$z_{(1-\alpha/2)}$= 1.96 for 95% CI

$z_{(1-\beta)}$= power = 80% = 0.84

Based on the calculation of the sample size as shown in table 3.1, the maximum sample size was 138. Considering for non-response rate,20% of extra respondents were included and making up the minimum respondents required were 158.

Table 3.1: Summarised of sample calculation using proportionate sampling formula

Parameter		Calculated sample size
Cognitive impairment (Wei, Nyunt, Gao, Wee, & Ng, 2017)	P1=0.644 (frail with cognitive impairment) P2=0.352 (Frail with non- cognitive impairment)	46×3 = 138
	P1= 0.871 (prefrail with cognitive impairment) P2=0.4652 (prefrail with without cognitive impairment)	20×3 = 60
	P1= 0.898 (non-frail with cognitive impairment) P2=0.1023 (non-frail without cognitive impairment)	5.2×3 = 16

3.3.2 Sample selection

Figure 3.1 shows that the respondents of this study were selected by a simple random sampling method. Whereby the respondents who did not match with inclusion criteria and exclusion criteria as shown in table 3.2 and the respondents who did not agree to participate was excluded in the study. All respondents who agreed to participate were given a written consent form and a set of questionnaires that was used for the interview.

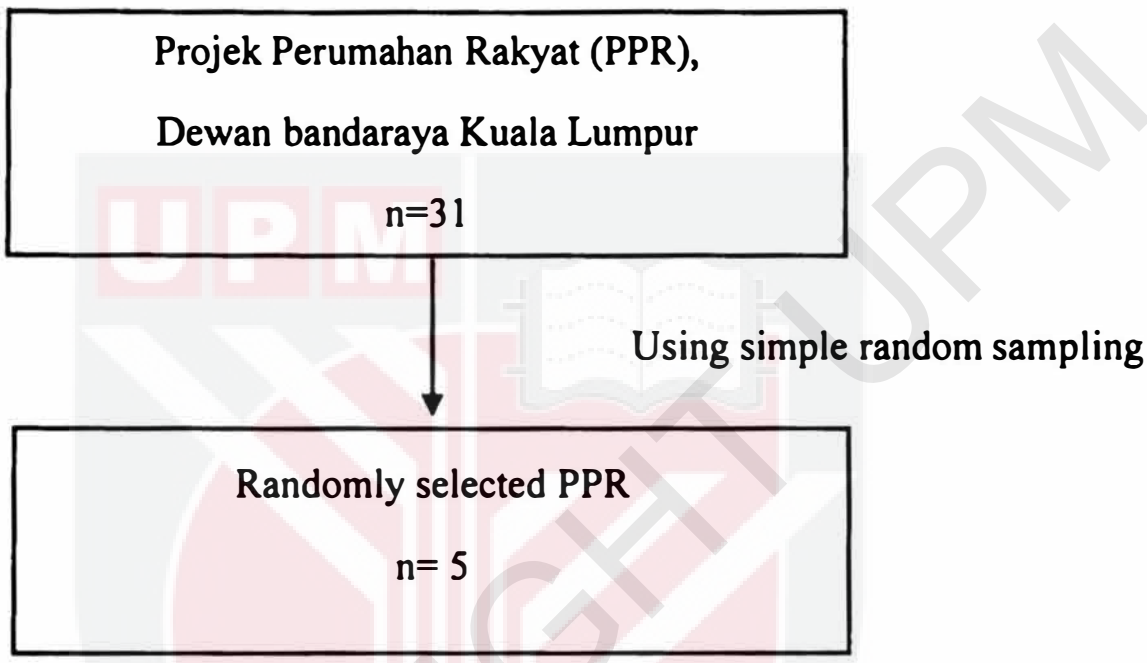


Figure 3.1 selection of the location

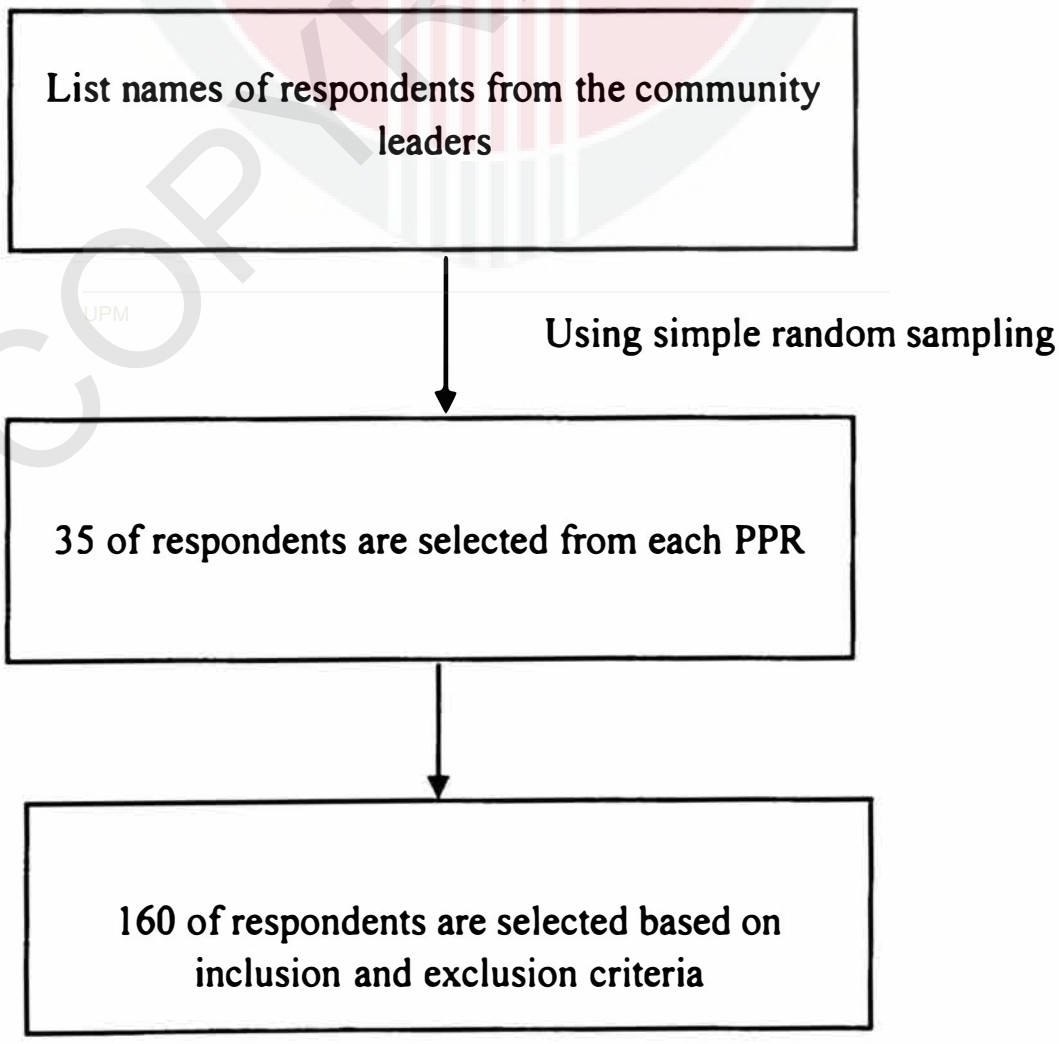


Figure 3.1 Selection of the respondents

The participants chosen in this study are elderly subjects at Program Perumahan Rakyat (PPR), Kuala Lumpur, Malaysia. Participants will be selected based in the inclusion and exclusion criteria table 3.2 as below: -

Table 3.2: the inclusion and exclusion criteria of the respondents

Inclusion	Exclusion
Malaysian	Foreigners
Aged 60 years and above	Respondents with severe physical disabilities
Male or female	Presence of Alzheimer or Parkinson disease
Able to communicate	
Able to walk without assistance	

3.5 Research instrument

3.5.1 Socio-demographic data (Section A):

Interview based questionnaire was used to determine socio-demographic factors that consists of sex, age, marital status, education level, living arrangement, occupational status and household income.

3.5.2 Health-related status variables (Section B):

The health-related status variables: self-report of chronic diseases (diabetes mellitus, heart disease, hypertension, respiratory problems, gastrointestinal problems, renal disease, and arthritis) and number of hospitalisations in the previous year was asked to the respondents. In addition, self-report of geriatric syndromes (number of medications taken) to assess polypharmacy.

3.5.3 Modified Barthel Index (BI) (Section C)

The Malay version of BI wad modified after the original modified Barthel Index and the internal reliability of Malay version of BI was examined by Cronbach's alpha coefficient. This questionnaire used to assess the presence of urinary incontinence and consist of 10 questions including basic Activities of Daily Living (ADL) and urinary incontinence. The urinary incontinence was assessed by asking the participants if they had problems with their bladder control. Answers of "yes" or "occasional" were classified as having urinary incontinence.

3.5.4 21-Item Fall Risk Index (Fri-21) (Section D)

The Fri-21 was developed and validated by the working group got fall prevention in Japanese Ministry of Health, welfare and Labor. This questionnaire consists of 21 items to identify those who have greater risk of fall among elderly. The 21 items included many dimensions such as physical, cognitive, emotional, social aspects of functioning and environmental factors. The subjects score 1 for each item indicates risk present, while those who score 0 for each item indicates risk absent and the total score range from 0 -21. The greater the scores indicates greater risk of fall.

3.5.5 Instrumental Activity Daily Living (IADL) (Section E)

The IADL is assessment tool to determine the mobility limitation among elderly. This assessment is a reliable and valid instrument that can be used by various examiners over varying times. The IADL questionnaire consists of various items, examining the participants ability using telephone, preparing food, housekeeping, doing laundry, using transportation, handling medications and finances. The eight items in the scale are classified as o (unable or partially able) or 1 (able) and the score of 7/8 is taken as the cut-off point where participant who score <7 indicates as having functional disability.

3.5.6 Malay version Geriatric Depression Scale (Section F)

The Malay Geriatric Depression Scale version (M-GDS-14) is based on Geriatric Depression Scale (GDS) that is widely used as a screening tool for depression among elderly. The (M-GDS-14) is translated from GDS 15 and validated for the local population. The scale consist of 14 items and questions were answered "yes" (1) or "no" (0). The subjects with score of less than 8 on M-GDS-14 are classified as normal, and while those with score of 8 and above classified as probable case of depression.

3.5.7 Mini Mental State Examination (Section G)

The Mini Mental State Examination (MMSE) is widely used tool for detecting cognitive impairment, assessing severity, and monitoring cognitive changes over time. There are 11 items in 5 categories: orientation (2 items), registration (1 item), recall (1 item), attention and calculation (1 item) and language (6 items). The maximum score is 30 and those who have scored less than 19 have a cognitive impairment.

3.5.8 Mini Nutritional Assessment (MNA) (Section H)

The MNA is widely used assessment tool for nutritional screening and easy to use and conveniently in any clinical care setting. The MNA-SF contains 6 questions concerning loss of appetite, unplanned weight loss in the previous 3 months, mobility, acute disease in the previous 3 months, depression or dementia and BMI. The maximum final MNA-SF score of 14 points and those who scored less than 11 points are considered at risk of malnutrition.

3.5.9 Fried criteria (Section I):

Frailty phenotype: Fried defines a phenotype of frailty by the presence of three or more of the following components: shrinking, weakness, poor endurance and energy, slowness and low physical activity level. The presence of one or two deficits indicates a pre-frail condition, while the lack of a deficit indicates a robust condition.

These criteria include five components:

1. Weight loss/ shrinking (Body mass index (BMI) BMI < 18.5kg/m^2 or self-reported unintentional weight loss over 10 pounds (4.5 kg) in the past 6 months).

2. Weakness (assessment based on the grip strength test using a hand-held dynamometer. The best three attempts on dominate hand will be using to ensure the reliability and accuracy.

3. Exhaustion (based on two questions from Center for Epidemiological Studies Depression (CES-D) scale and score of two or three is classified as exhaustion).

4. Slowness (The time taken to walk 4 meters without assistance for a respondent is measured. Participants who take more than 6 seconds to complete the walk are classified as having a low speed).

5. Low physical activity (frequency, duration and intensity of usual activities based on the Physical Activity Scale for the Elderly (PASE) Questionnaire).

3.6 Study approval

Ethical approval for this study was obtained from the University Research Ethics Committee, University Putra Malaysia.

3.7 Pre-testing

A pre-test testing is done before the real data collection of the study. It involves 16 subjects with similar inclusion and exclusion criteria of the sample size of were randomly selected from that PPR. The objectives of pre-testing are to assess whether each of the instruction given in the instrument is clear to the respondents and the instruments used are relevant and relatable to the respondents. Pre-testing allows to improve and modify the instruments in order to make it more feasible and reliable before it is used for the real time of data collection.

3.8 Data collection procedure

This study will be conducted from 19 January 2019 to 30 March 2019. In order to collect the data, the proposal was approved from Jawatankuasa Etika Universiti untuk Penyelidikan Melibatkan Manusia (JKEUPM) in conducting the study. The participants were given an information sheet to inform about the study and consent form for the respondents to participants in this study. A face-to-face interview was conducted to collect all data.

3.9 Data analysis

All data was analysed using SPSS (version 23.0) computer software. Prior to analyse, data were explored to ensure that the data were normally distributed. Description analysis was used to determine the mean, median, frequency, standard deviation, range and percentage of all variables. For bivariate analysis using the chi square test used in this study. Statistical p level $p<0.05$ was considered as a significant.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Socio-demographic and socioeconomic characteristics

The total of the respondents was 160 aged 60 years and above were recruited from PPR on Kuala Lumpur. In this study, 40.8% were males and 59.4% were females which show the proportion of female is higher than males. Among all the respondents, the highest percentage of ethnicity are Malay (66%), followed by Indian (21.2%) and then Chinese (12.5%) as shown in figure 4.1.

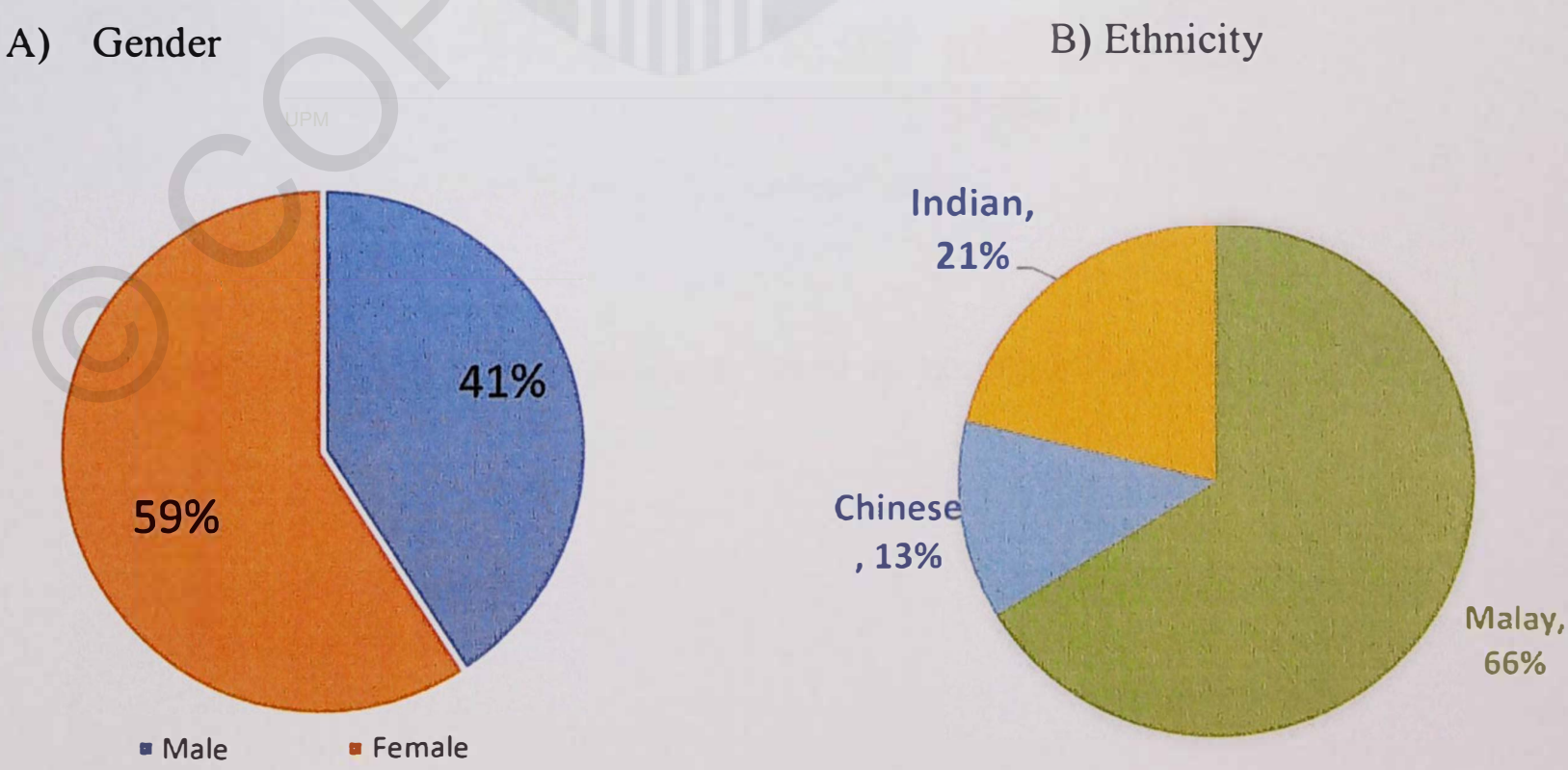


Figure 4.1 : Percentage of respondents based on gender and ethnicity

Based on figure 4.2, the respondents are classified into two groups, which 60-74 years old and aged 75 years old and above. The age mean of the respondents was 68.01 ± 5.842 years old, ranging from 60 to 84 years old. Most of the respondents were aged 60-74 years old with 137% compared to elderly aged 75 years old and above with 23%. The percentage of female elderly found in the age group 60-74 years old is higher than a male with 84%. As for the age group, 75 years and above the percentage of male elderly is slightly higher than a female with 12%.

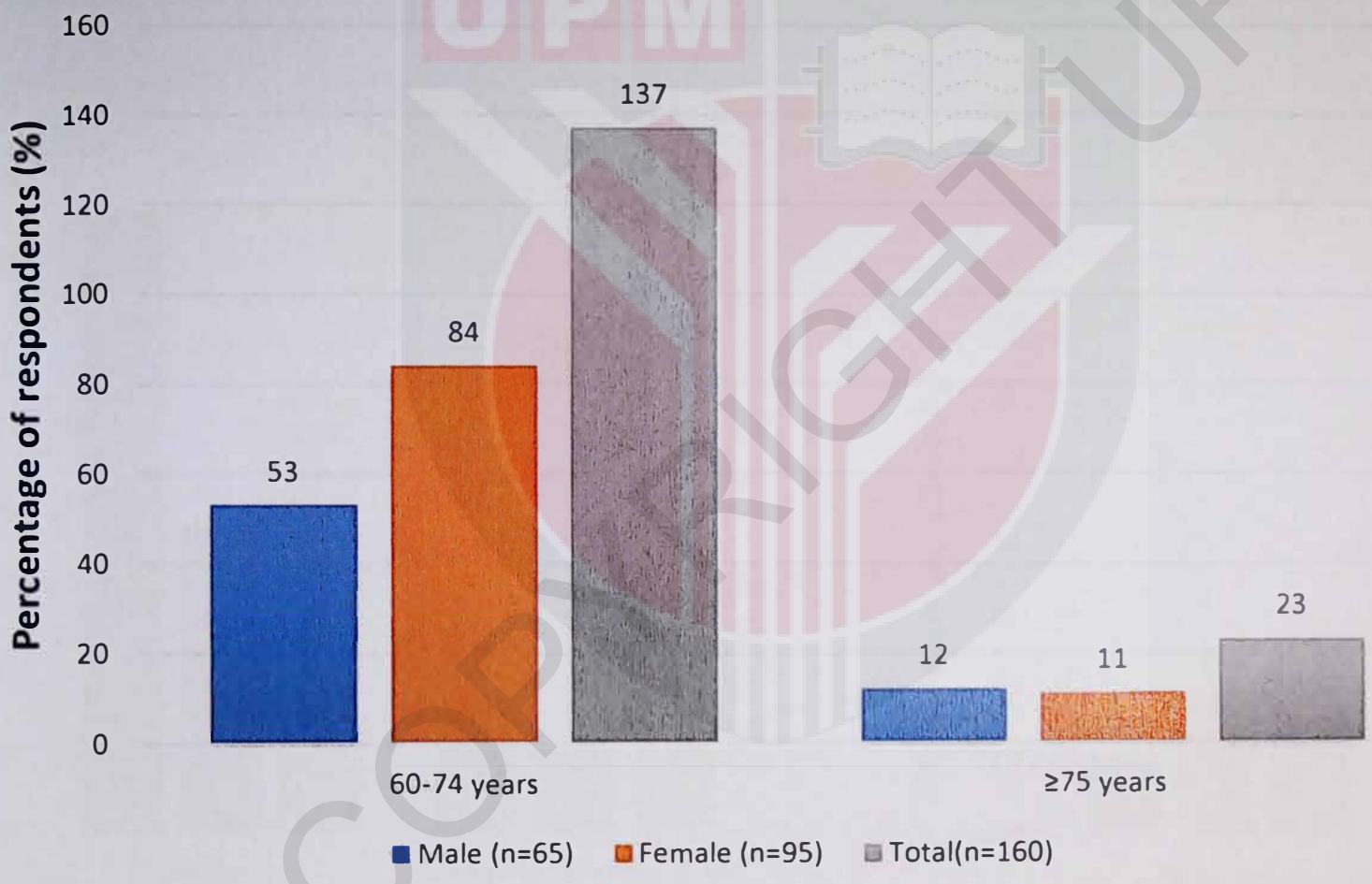
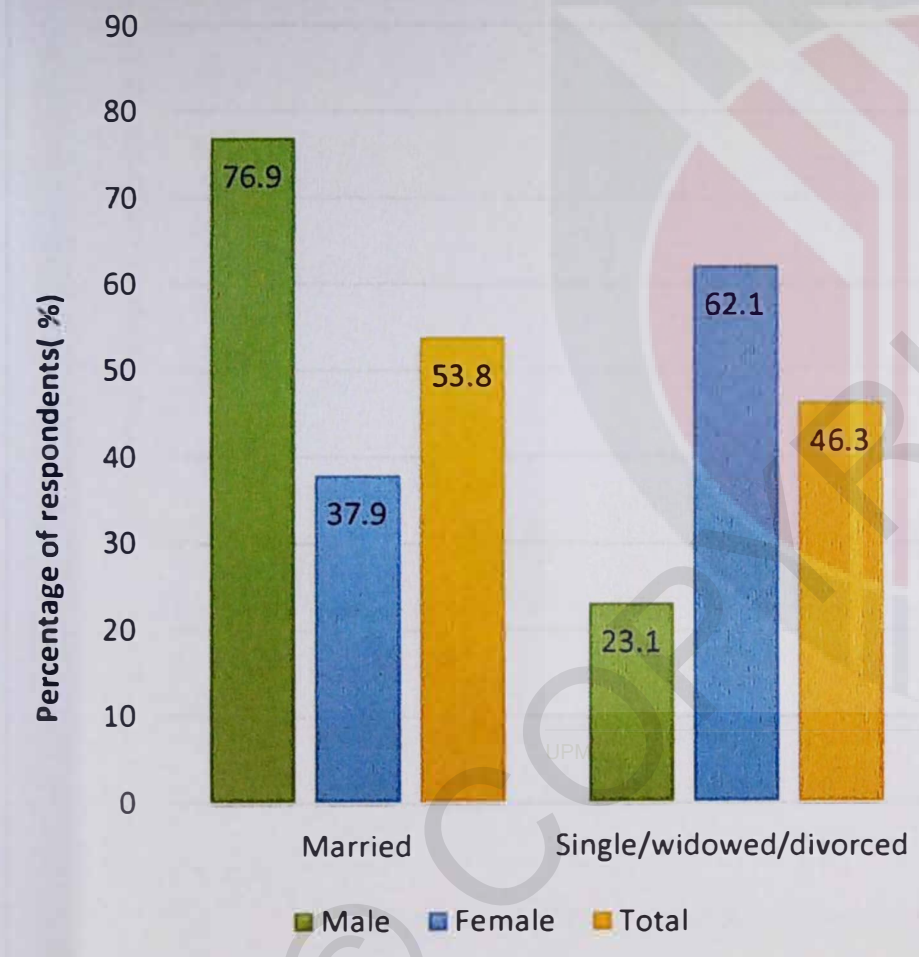


Figure 4.2: Percentage of respondents based on age classification

In terms of marital status and educational level according to gender as shown in figure 4.3. This study shows that half of the respondent is married (53.8%) in which 37.8% were female and 76.9% were male. Followed by single/widowed/divorced with 46.3% in which 62.1% were female and 23.1% were male. Majority of the respondents had formal education with 83.8% compared to the respondent with no formal education was 16.3%. The proportion of male having formal education is higher then female with 89.2%.

D) Marital status



E) Educational level

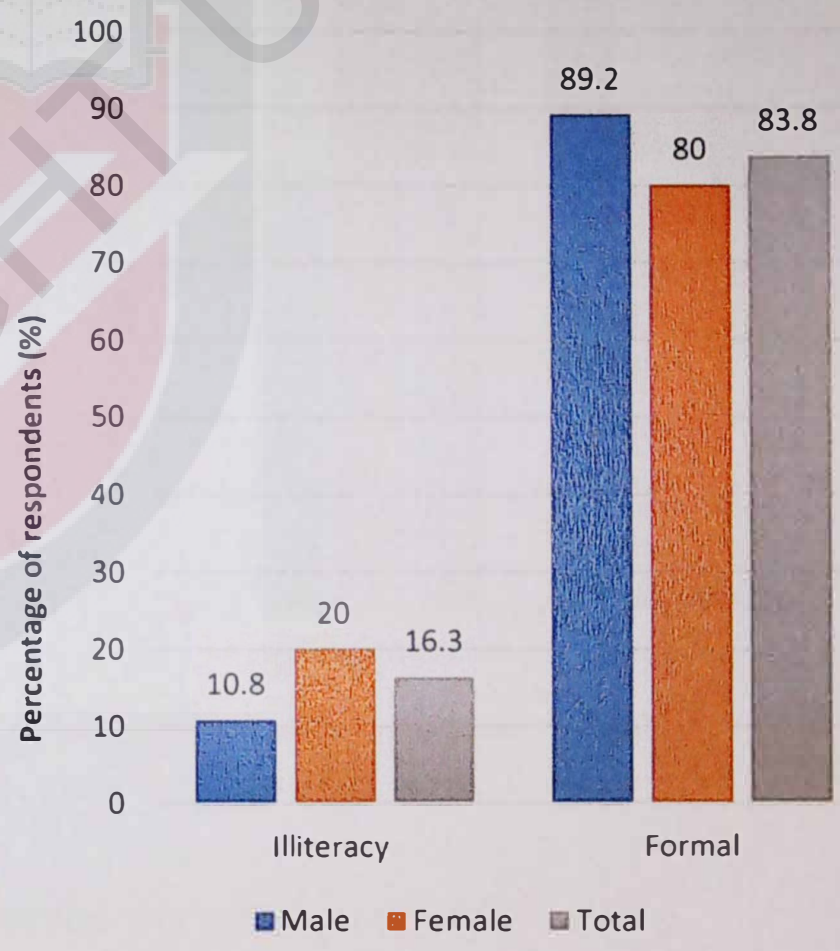
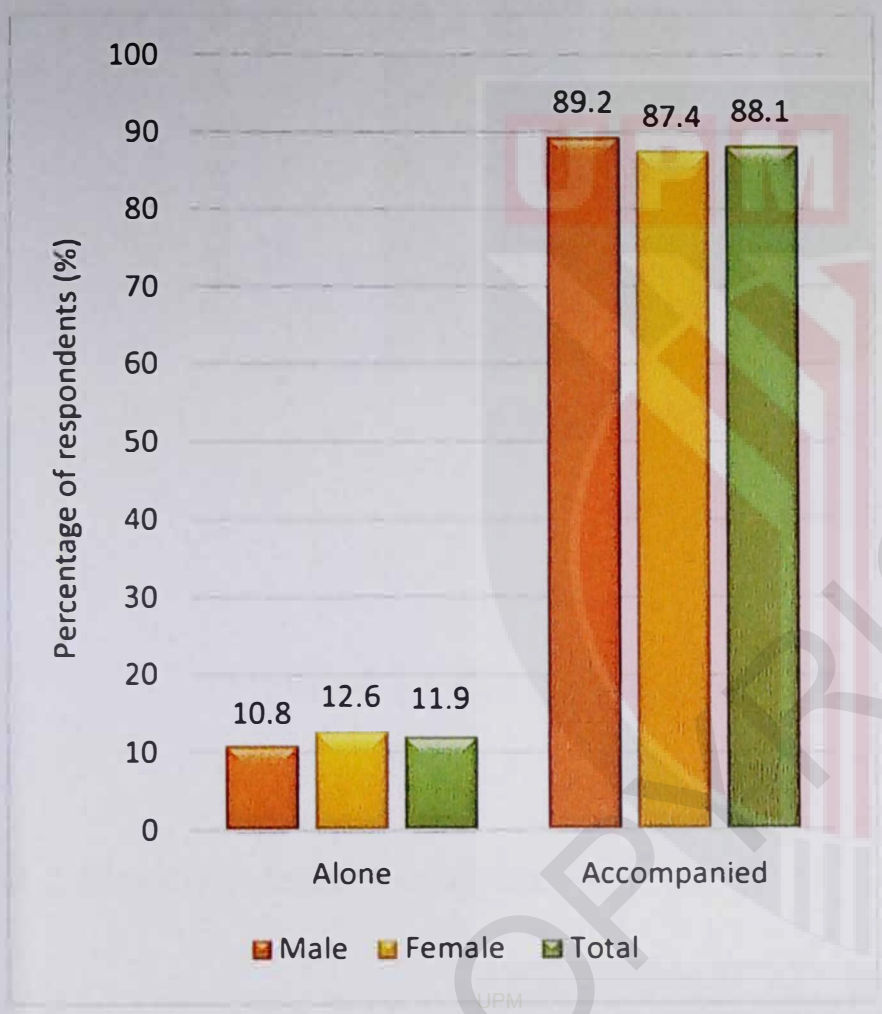


Figure 4.3: Percentage of marital status and educational level according to gender

As for the living arrangement, most of the respondents are accompanied with husband, children or living with others (88.1%) which there small differences in the percentage where the male (89.2%) and female (87.4%). For the occupation status, half of the respondents are unemployed/retired (53.1%) and the female has a higher proportion of being unemployed/ retired compared to male respondents with 62.1%. Besides that, male respondents have a higher proportion of being employed than a female with 60%.

F) Living arragement



G) Occupational status

Figure 4.4 :Percentage of living arragement and occupational status according to gender.

The result for the household income as shown in figure 4.5. About half (50.6%) of the respondents have a middle-income level(RM500-RM1499), followed by low-income level (≤RM500) with 32.7% and lastly high-income level (≥RM1500) with 16.7%.

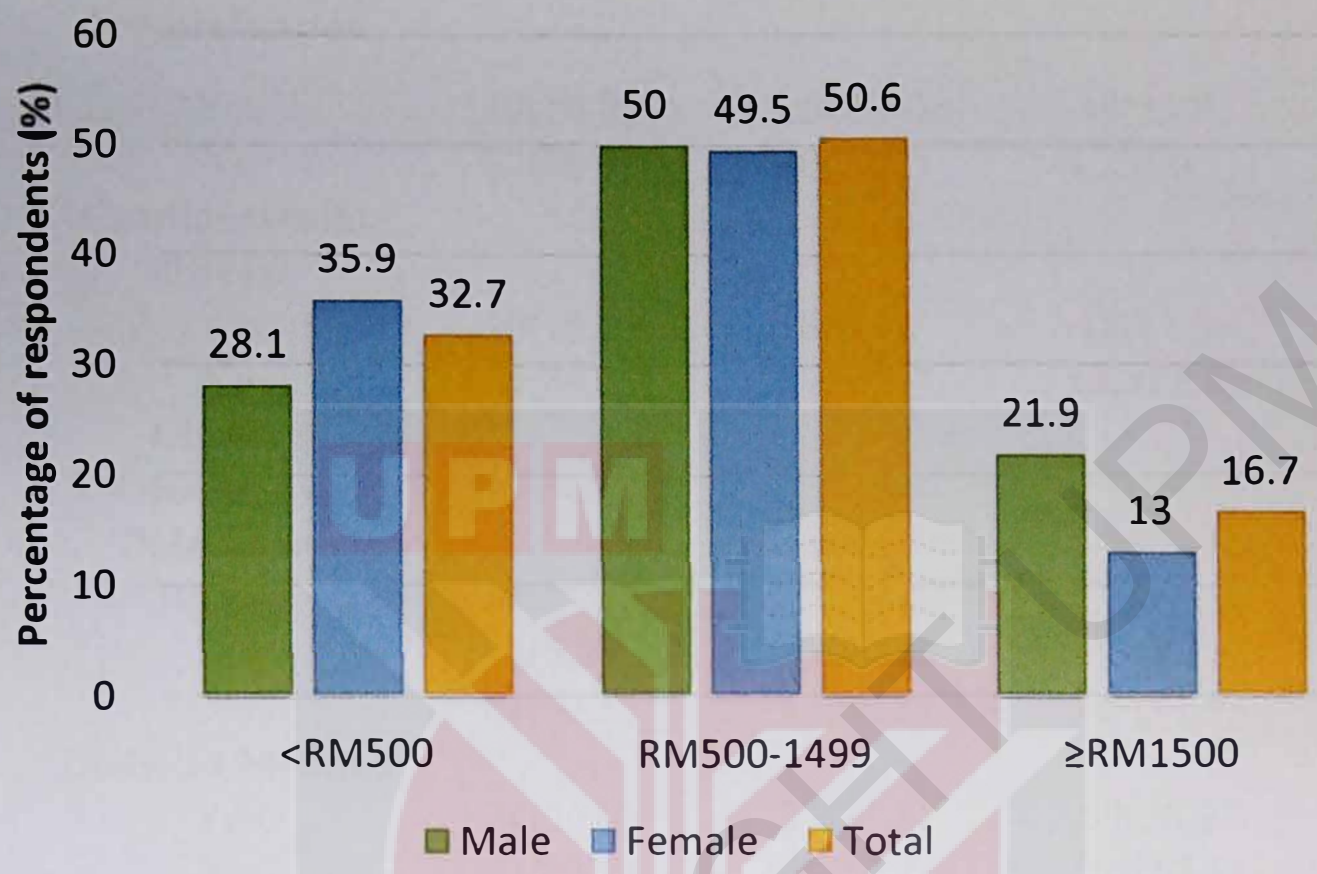


Figure 4.5 : The percentage of household income according to gender.

4.2 Health related variables

Table 4.2 shows the distribution of respondent's health-related variables according to gender. In this study the findings show that hypertension (46.3%) is the most reported chronic disease followed by diabetes mellitus (36.9%), cardiovascular diseases (11.3%), chronic obstructive pulmonary diseases (8.1%), kidney disease (6.3%), intestinal tract disease and arthritis/ gout (5.6%). About 23.8% reported having a history of hospitalization in the past year.

Table 4.2: Distribution of the respondents according to health-related variables [n (%)]

Characteristics	n (%)		
	Male (n 65)	Female (n=95)	All (n=160)
History of hospitalization			
Yes	13(20.0)	25(26.3)	38(23.8)
No	52(80.0)	70(73.7)	122(76.3)
Cardiovascular disease			
Yes	10(15.4)	8(8.4)	18(11.3)
No	55(84.6)	87(91.6)	142(88.8)
Chronic Obstructive Pulmonary Disease			
Yes	4(6.2)	9(9.5)	13(8.1)
No	61(93.8)	86(90.5)	147(91.9)
Diabetes Mellitus			
Yes	24(36.9)	35(36.8)	59(36.9)
No	41(63.1)	60(63.2)	101(63.1)
Cancer			
Yes	3(4.6)	6(6.3)	9(5.6)
No	62(95.4)	89(93.7)	151(94.4)
High blood pressure			
Yes	28(43.1)	46(48.4)	74(46.3)
No	37(56.9)	49(48.4)	86(53.8)
Kidney disease			
Yes	3(4.6)	7(7.4)	10(6.3)
No	62(95.4)	88(92.6)	150(93.8)
Intestinal tract disease			
Yes	3(4.6)	6(6.3)	9(5.6)
No	62(95.4)	89(93.7)	151(94.4)
Arthritis/Gout			
Yes	7(10.8)	10.(10.5)	9(5.6)
No	58(89.2)	85(89.5)	151(94.4)
Others			
None	57(87.7)	83(87.4)	140(87.5)
Back Pain	3(4.6)	3(3.2)	6(3.8)
High Cholesterol	2(3.1)	6(6.3)	8(5.0)
Knee Pain	3(4.6)	3(3.2)	6(3.8)

4.3 Selected geriatric syndrome

4.3.1 Depressive symptoms

Table 4.3.1 shows the distribution of the respondent's depressive symptoms according to gender. The depressive symptoms were assessed using Malay version Geriatric Depression Scale. Most of the respondents were reported to be classified as normal (82.5%). Only 17.5% of the respondents were suggestive of depressive symptoms. 22.1% of female respondents are categorised as suggestive of depressive symptoms and 10.8% of male respondents were categorised as suggestive depressive symptoms.

Table 4.3.1: Distribution of the respondent's depressive symptoms category according to gender

Depressive symptoms Category	n (%) Male (n 65)	Female (n=95)	All (n=160)
Normal (0-5)	58(89.2)	74(77.9)	132(82.5)
Suggestive of depressive symptoms (>5)	7(10.8)	21(22.1)	28(17.5)

4.3.2 Urinary incontience

For the urinary incontinence, the respondent was assessed using the Modified Barthel index. The findings show that almost all of the respondents are mild and minimal dependent with 98.1% compared to the respondents that are total/severe/ moderate dependent with 1.9%. where male respondents have a higher proportion of urinary incontinence (100%) compared to female (96.8%).

Table 4.3.2: Distribution of the respondent's urinary incontinence according to gender

Urinary incontinence	n (%)		
	Male	Female	Total
Total/Severe/ Moderate dependent	0(0.0)	3(3.2)	3(1.9)
Mild and Minimal dependent	65(100.0)	92(96.8)	157(98.1)

4.3.3 Falls

As for falls, 21-item fall risk index (FRI-21) was used to assess the respondents falls risk. Among the percentage was highest in the category low risk of falling (60.6%), followed by a high risk of falling (31.9%) and moderate risk of falling (7.5%). The percentage of having a high risk of falling is higher in female(40.0%) than male (20.0%).

Table 4.3.3: Distribution of the respondents according to falls

Falls	n (%)		
	Male (n 65)	Female (n=95)	All (n=160)
Low risk of falling	46(70.8)	51(53.7)	97(60.6)
Moderate risk of falling	6(9.2)	6(6.3)	12(7.5)
High risk of falling	13(20.0)	38(40.0)	51(31.9)

4.3.4 Mobility limitation

The respondent's mobility limitation was examined using instrumental activity daily living (LADL). Table 4.3.4 shows that 71.3 % of the respondents have an absence of mobility

limitation and 28.8% of the respondents are classified as mobility limitation. Among the respondents female have a higher prevalence of mobility limitation (35.8%) than male (18.5%).

Table 4.3.4: Distribution of the respondents Mobility limitation according to gender

Mobility limitation category	n (%) Male (n 65)	Female (n=95)	All (n=160)
Mobility limitation	12(18.5)	34(35.8)	46(28.8)
Normal	53(81.5)	61(64.2)	114(71.3)

4.3.5 Cognitive impairment

From table 4.3.5, the percentage of the respondents were categorized as a cognitive impairment was 15.6%, where among male (9.2%) and female (20.0%). There are no significant differences were observed according to gender.

Table 4.3.5: Distribution of the respondent's cognitive impairment according to gender

cognitive impairment category	n (%) Male (n 65)	Female (n=95)	All (n=160)
cognitive impairment	6(9.2)	19(20.0)	25(15.6)
normal	59(90.8)	76(80.0)	135(84.4)

4.3.6 Malnutrition

The respondent's malnutrition was assessed using the Mini Nutritional Assessment. Only 7.5% of the respondents were categorised as malnutrition. Where female proportion is higher (9.5%)

compared to male (4.6%). Around 48% of the respondents were classified as at risk of malnutrition and 44.4% of the respondents were categorised as normal.

Table 4.3.6: Distribution of the respondent's malnutrition according to gender

Malnutrition category	n (%) Male (n 65)	Female (n=95)	All (n=160)
Malnutrition	3(4.6)	9(9.5)	12(7.5)
At risk of malnutrition	32(49.2)	45(47.4)	77(48.1)
Normal	30(46.2)	41(43.2)	71(44.4)

4.3.7 Polypharmcy

Based on table 4.3.7 shows the distribution of the respondent's polypharmacy according to gender. Half of the respondents take less than 5 medications (55%), where the male higher percentage (58.5%) as compared to female (52.6%). 45% of the respondents take more than 5 medications which the proportion of female is higher (47.4%) than male (41.5%).

Table 4.3.7: Distribution of the respondent's polypharmacy according to gender

polypharmacy category	n (%) Male (n 65)	Female (n=95)	All (n=160)
<5 medications	38(58.5)	50(52.6)	88(55.0)
>5 medications	27(41.5)	45(47.4)	72(45.0)

4.4 Prevalence of frailty syndrome among the respondents

The prevalence of frailty syndrome was assessed using fried criteria and the frailty syndrome was classified into normal, pre-fail and frail. As shown in table 4.4, the result shows the prevalence of frailty according to gender. The prevalence of frail group among the respondents

was 18.1% which female has a higher proportion (21.1%) compared to male respondents (13.8%). Besides that, 77.5% and 4.4% of the respondents were categorised as pre-fail and normal respectively. A study conducted in a rural district in the Kuala Nerus found a similar result that the prevalence of frailty syndrome was 18.3% (Fairus Asma et al., 2018). Also, a study conducted by Badrasawi et al.,(2017) the prevalence of frailty among urban areas in Malaysia older adult was 8.9%. In addition, a study conducted in Malaysia among elderly individuals residing in an urban district found that the weighted prevalence estimate of prefrail was 67.7% and 5.7% (Sathasivam, Kamaruzzaman, Hairi, Ng, & Chinna, 2015)

Table 4.4: Prevalence of frail groups according to gender

Frail category	n (%)			x^2	*p-value*
	Male (n 65)	Female (n=95)	All (n=160)		
				8.34	0.147
Normal	1(1.5)	6(6.3)	7(4.4)		
Pre-fail	55(84.6)	69(72.6)	124(77.5)		
Frail	9(13.8)	20(21.1)	29(18.1)		

4. 5 Association between socio-demographic and socioeconomic characteristics with frailty syndrome

Table 4.5 shows the associations between socio-demographic characteristics with frailty status. More than half of female respondents (69%) were found to have a higher prevalence of frailty syndrome compared to male (31%). As for the age group, the highest age group have a higher proportion of frailty was ≥75 years old with 20.7%, followed by 60-74 years old with 14.4%. other than that, the prevalence of frailty syndrome was higher among Malay (69%), Single/widowed/divorced (62.1%), formal education (89.7%), living with others (82.8%), unemployed/retired (55.2%) and middle-income level with RM500-1499 (60.7%).

This study shows there is no association between sex, age, ethnicity, marital status, educational level, occupational status and household income with frailty status. And the result of this study

is supported by a study conducted among elderly in Klang Valley of Malaysia found that there is no association between age, ethnicity, living arrangement and household income with frailty status (Badrasawi et al., 2017). Another study conducted in Malaysia (in East Coast of Peninsular) found that there is no relationship between gender and education level with frailty status (Fairus Asma et al., 2018).

Table 4.5: Associations between socio-demographic characteristics and frailty status

Socio-demographic and socioeconomic characteristics	n (%) None-frail	Frail	x^2	*p-value*
Sex			0.1351	0.245
Male	56(42.7)	9(31.0)		
Female	75(57.3)	20(69.0)		0.378*
Age				
60-74 years old	114(87.0)	23(14.4)		
>75 years old	17(10.6)	6(20.7)		
Ethnicity			3.030	0.220
Malay	86(65.6)	20(69.0)		
Chinese	19(14.5)	1(3.4)		
Indian	26(19.8)	8(27.6)		
Marital status			3.565	0.059
Married	75(57.3)	11(37.9)		
Single/widowed/divorced	56(42.7)	18(62.1)		
Educational level				0.417*
Illiteracy	23(17.6)	3(10.3)		
Formal	108(82.4)	26(89.7)		
Living arrangement				0.344*
Alone	14(10.7)	5(17.2)		
Accompanied	117(89.30	24(82.8)		
Occupational status			0.060	0.807
Unemployed/retired	69(52.7)	16(55.2)		
Employed	62(47.3)	13(44.8)		
Household income			2.544	0.280
<RM500	42(32.8)	9*32.1)		
RM500-1499	62(48.4)	17(60.7)		
>RM1500	24(18.8)	2(7.1)		

Chi-square test:

*p-value based on Fisher Exact Test, **p<0.05, significant difference between frail group

4.6 Association between health-related variables with frailty syndrome

As shown in table 4.6, the association between health-related variables with frailty status. The prevalence of frailty syndrome among respondents with a history of hospitalization in the past year only 20.7%. The result in this study shows that high prevalence of frailty syndrome in terms of chronic diseases, where hypertension (51.7%), diabetes mellitus (37.9%), cardiovascular disease (13.8%), intestinal tract disease& other diseases (10.3%), kidney disease (6.9%), cancer (3.4%) and chronic obstructive pulmonary disease (2.5%). In this study shows there is no association between health-related variables with frailty syndrome except for arthritis/gout (P=0.044). A study conducted by Fhon et al., (2018) found that self-reported chronic diseases are not associated with frailty syndrome. Also, another study finding showed that most of the diseases insignificantly associated with frailty (Fairus Asma et al., 2018). Besides that, the findings in this study show similar result reported by González-Pichardo et al. (2014) shows that there is a significant association between arthritis/gout and frailty status among Mexican community-dwelling elderly.

Table 4.6: Associations between health-related variables and frailty status

Health related variables	n (%) None-fail	Frail	x^2	*p-value*
History of hospitalization			0.183	0.669
Yes	32(24.4)	6(20.7)		
No	99(75.6)	23(79.3)		
Cardiovascular disease				0.745*
Yes	14(10.7)	4(13.8)		
No	117(89.3)	25(86.2)		
Chronic Obstructive Pulmonary Disease				0.256*
Yes	9(6.9)	4(2.5)		
No	122(93.1)	25(86.2)		
Diabetes Mellitus			0.017	0.896
Yes	48(36.6)	11(37.9)		
No	83(82.2)	18(62.1)		
Cancer				0.1000*
Yes	8(6.1)	1(3.4)		
No	123(93.9)	28(96.6)		
High blood pressure			0.427	0.513
Yes	59(45.0)	15(51.7)		
No	72(55.0)	14(48.3)		
Kidney disease				0.1000*
Yes	8(6.1)	2(6.9)		
No	123(93.9)	27(93.1)		
Intestinal tract disease				0.209*
Yes	6(4.6)	3(10.3)		
No	125(95.4)	26(89.7)		
Arthritis/Gout				0.044*
Yes	17(13.0)	0(0.0)		
No	114(87.0)	29(100.0)		
Others				0.1000*
Yes	114(26)	3(10.3)		
No	17(3)	26(89.7)		

Chi-square test:

*p-value based on Fisher Exact Test, **p<0.05, significant difference between frail group

4.7 Association between selected geriatric syndrome with frailty status

The result is shown in table 4.7, the association between selected geriatric syndrome with frailty status. For the polypharmacy, only 44.8% of the respondents are categorized as frail and there is no association between polypharmacy and frailty syndrome. As for cognitive impairment, around 10% of the respondents were classified as frail. Also, there is no association between cognitive impairment and frailty status among the respondents. In addition, there is no association found between falls and frailty syndrome. However, 41.4 of the high risk of falling respondents are categorised as frail. Besides that, the result of urinary incontinence shows that there is no relationship with frailty syndrome and 93.1% of the proportion of urinary incontinence classified as frail. Next, mobility limitation also shows there is no significant association between frailty status. Only 41.4% of the respondents were mobility limitation is categorised as having frailty syndrome. Moreover, 62.1% of respondents with malnutrition and risk of malnutrition were classified as frail and there is no significant relationship between malnutrition and frailty syndrome. Similar result found that cognitive status, falls and polypharmacy is not associated with frailty syndrome (Fhon et al., 2018)

Furthermore, the findings in this study show that there is a significant association between depressive symptoms and frailty syndrome (P=0.034). Around 31.0% of the prevalence of the respondents with depressive symptoms were categorized as frail. Faius Asma et al. (2018) conducted a study in a rural district in the Kuala Nerus found there is a significant association between depressive symptoms and frailty status. Also, a study conducted among community-dwelling older adults in Singapore found that depressive symptoms to be correlated with frailty syndrome (Ge, Yap, & Heng, 2019).

Table 4.7: Associations between selected geriatric syndrome and frailty status

	n (%)			
Geriatric Syndrome	None -fail	Frail	x^2	*p-value*
Polypharmacy			0.000	0.984
< 5 medications	72 (55.0)	16 (55.2)		
>5 medications	59 (45.0)	13 (44.8)		
Cognitive impairment				0.573*
Normal	109(83.2)	26(89.7)		
Cognitive impairment	22(16.8)	3(10.3)		
Falls			1.43	0.225
Low/ Moderate	92(70.2)	17(58.6)		
High Risk	39(29.8)	12(41.4)		
Urinary Incontinence				0.085*
Total/Severe/Moderate Dependent	1(0.8)	2(6.9)		
Mild and Minimal Dependent	128(99.2)	27(93.1)		
Mobility Limitation			2.056	0.152
Normal	97(74.0)	17(58.6)		
Mobility limitation	34(26.0)	12(41.4)		
Malnutrition			0.596	0.440
Normal	60(45.8)	11(37.9)		
Malnutrition and at risk of having	71(54.2)	18(62.1)		
Depressive symptoms			4.494	0.034**
Normal	112(85.5)	20(69.0)		
Depressive	19(14.5)	9(31.0)		

Chi-square test:

*p-value based on Fisher Exact Test, **p<0.05, significant difference between frail group

CHAPTER 5

CONCLUSION, LIMITATION AND RECOMMENDATION

5.1 Conclusion

This study was an emphasis on elderly people aged >60 years old and above with an aim to assess the association between selected geriatric syndrome with frailty syndrome. The elderly people were recruited from PPR in Kuala Lumpur and face to face interview was conducted to determine the relationship of socio-demographic and socioeconomic characteristics, health-related variables and selected geriatric syndrome with frailty status. 160 of the total of respondents, where 59% were female and 41% were male. The findings in this study show that age range from 60 to 74 years old with a mean age of 68.01 ± 5.842 years old. More than half of the respondents were Malay (66%), followed by Indian (21.2%) and then Chinese (12.5%) and almost half of the respondents were single, widowed and divorced (46.3%). Other than that, most of the respondents have formal education with 83.8% and half of the respondents were unemployed/retired (53.1%). Besides that, 88.4% of the respondents were accompanied with their spouse or children and half of the respondents have middle income (RM500-rm1499) with 50.6%.

As for the health-related variables, respondents that reported with a history of hospitalization in the past year was 23.8%. The most common chronic diseases were found among the

respondents were hypertension (46.3%), followed by diabetes mellitus (36.9%), cardiovascular diseases (11.3%), chronic obstructive pulmonary diseases (8.1%), kidney disease (6.3%), intestinal tract disease and arthritis/ gout (5.6%).

In terms of the prevalence of the frailty syndrome among the respondents according to gender, the prevalence of frail and pre-frail were 18.1 and 77.5 respectively. The proportion of female being frail (21.1%) found to be higher than male (13.8%).

Furthermore, for the selected geriatric syndrome, which (Polypharmacy, Malnutrition, Cognitive impairment, Mobility limitation,Falls,Urinary incontinence and Depressive symptoms). Firstly, polypharmacy, almost half of the respondents take more than 5 medications (45.0%) where female percentage slightly higher (47.4) compared to male (41.5%). Secondly, around 7.5% of the respondents were categorized as malnutrition, which female proportion is higher (9.5%) than male (4.6%). Thirdly, the prevalence of cognitive impairment among the respondents was 15.6% where females have a higher percentage (20.0%) than male (9.2%). Next, only 28.8% among the respondents were classified as a mobility limitation which 35.8% were female and 18.5%. Besides that, the respondent that has a high risk of falling was 31.9%, where the female proportion was double (40.0%) than male respondents (20.0%). Other than that, almost all of the respondents were mild and minimal dependent (98.1%), where 100% were male and 96.8 were female. Lastly, the respondents with depressive symptoms were 17.5%, which female has a higher proportion (22.1%) compared to male (10.8%) and the only geriatric syndrome were found significantly associated with frailty status among all the selected geriatric syndrome was depressive symptoms (P=0.034).

5.2 Limitation

In this study there few limitations, firstly, the study design was cross-sectional study, which did not allow to determine cause and effect of frailty status. Secondly, the sample size requirements for the cross-sectional study may be very large especially when conducted study about rare outcome and exposure. Thirdly, limited to a certain location because most PPR in Kuala Lumpur belong to Malay community which association between ethnicity and frailty could not be determined due to the majority of the respondents are Malay.

5.3 Recommendation

Further studies are needed in order to understand the relationship between geriatric syndrome and frailty status. Cohort study should be conducted to able to determine the causes of disease and to identify related risk factors and health outcomes. And a larger sample size should be included to provide more accurate result and able more to present the Malaysian population. Also, future researchers should assess frailty status with different instruments other than fried criteria such as frailty index (FI), FRAIL (Fatigue, Resistance, Ambulation, Illnesses, Loss of weight) (International Academy of Nutrition and Aging) and The Clinical Frailty Scale (CFS) which needed in different settings among older adult.

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Appendices

Appendix I

ETHICAL APPROVAL

APPENDIX II

RESPONDENTS INFORMATION SHEET

SENARAI PA/PPR DI DBKL

ZON 1	KAWASAN	BILANGAN BLOK
Pengurus Zon : Encik Mohd Syawal bin Yatim **Alamat Zon :** Kompleks Belia Bandaraya Jalan Cheras, Kuala Lumpur **No Telefon** : 03-9200 2261	1. Seri Sabah 3A	4
	2. Seri Sabah 3B	5
	3. Seri Pulau Pinang	16
	4. Taman Ikan Emas	10
	5. Seri Johor 4A/B	10/6
	6. Seri Johor 4C	11
	7. Seri Melaka	14
	8. Seri Kota	6
	9. Seri Labuan	8
	10. PPR Taman Mulia	2
	11. PPR Desa Tun Razak	4
	12. PPR Pudu Ulu	3
	13. PPR Laksamana	4
	14. PPR Perkasa	3
	15. PPR Seri Malaysia	2
	16. PPR Raya Permai	4
	17. PPR Desa Petaling	2

ZON 2	KAWASAN	BILANGAN BLOK
Pengurus Zon : Encik Shahrin bin Sulaiman **Alamat Zon :** Blok 2 PPR Seri Alam Jalan Sungai Besi 57100 Kuala Lumpur **No Telefon** : 03-92238137	1. Seri Sarawak	3
	2. Loke Yew	5
	3. Jalan Hang Tuah	2
	4. PPR Kg Limau	2
	5. Seri Pahang	5
	6. Seri Selangor	6
	7. PPR Pantai Ria	2
	8. Bukit Kerinchi 1A	1
	9. Putra Ria	3
	10. PPR Seri Pantai	2
	11. PPR Salak Selatan	2
	12. PPR Kerinchi	6
	13. PPR Kg Muhibbah	9
	14. PPR Seri Anggerik	1
	15. PPR Seri Cempaka	2
	16. PPR Seri Alam	12
	17. PPR Bukit Jalil	11

APPENDIX III

QUESTIONAIRES

FAKULTI PERUBATAN DAN SAINS KESIHATAN
JABATAN PEMAKANAN DAN DIETETIK

BORANG SOAL SELIDIK KAJIAN

TAJUK KAJIAN:

PREVALANS DAN FAKTOR-FAKTOR BERKAITAN DENGAN SINDROM KEUZURAN DALAM KALANGAN WARGA TUA MALAYSIA DI FLAT PPR KUALA LUMPUR

PENYELIDIK:

DUAA AHMED MOHAMED AL-JUNID

PENYELIA PROJEK:

DR. SITI NUR 'ASYURA BINTI ADZNAM

TARIKH: ☐☐ ☐☐ ☐☐☐☐

KOD RESPONDEN: ☐☐☐☐☐

Borang soal selidik ini mengandungi **SEPULUH** bahagian iaitu bahagian A (latar belakang responden), bahagian B (penyakit kronik), bahagian C (penilaian tahap kemurungan), bahagian D ( ), bahagian E ( ) bahagian F (ujian status fungsian), bahagian G (penilaian tahap kognitif), bahagian H (risiko malnutrisi), bahagian I (penilaian frailty), bahagian J (penilaian aktiviti fizikal).

KOD RESPONDEN:

BAHAGIAN A: LATAR BELAKANG RESPONDEN

ARAHAN: Sila tandakan (/) pada jawapan yang berkenaan

		Catatan
1.	**JANTINA:** 1. ☐ Lelaki 2. ☐ Perempuan	
2.	**UMUR:** **TARIKH LAHIR:**	
3.	**BANGSA:** 1.☐ Melayu 2. ☐ Cina 3. ☐ India 4. ☐ Lain-Lain : _____	
4.	**STATUS PERKAHWINAN:** 1. ☐ Bujang 2. ☐ Berkahwin 3. ☐ Bercerai 4. ☐ Janda/Balu/Duda Sudah berapa lama menjadi balu/janda/duda: _____tahun	
5.	**TAHAP PENDIDIKAN:** 1. ☐ Tidak bersekolah 2. ☐ Sekolah agama/pondok 3. ☐ Sekolah rendah 4. Sekolah menengah rendah 5. ☐ Sekolah menengah atas 6. ☐ Sijil/ diploma/ijazah	
6.	**TINGGAL DIRUMAH BERSAMA:** 1. ☐ Sendirian 2. ☐ Dengan suami/ isteri 3. ☐ Dengan suami/isteri dan anak 4. ☐ Dengan anak dan cucu 5. ☐ Lain-lain (sila nyatakan: _____)	
7.	**STATUS PEKERJAAN:** 1. ☐ Tidak bekerja/suri rumah 2. ☐ Pesara (nyatakan pekerjaan dahulu _____) 3. ☐ Pesara tetapi masih bekerja (nyatakan pekerjaan sekarang _____) 4. ☐ Bekerja (nyatakan _____)	
8.	**SUMBER KEWANGAN UNTUK SARA HIDUP** (Boleh tanda lebih dari 1) 1. ☐ Gaji 2. ☐ Pencen 3. ☐ Simpanan 4. ☐ Suami/isteri/pasangan 5. ☐ Kebajikan 6. ☐ Anak-anak 7. ☐ Lain-lain. Nyatakan_____	
9.	**JUMLAH PENDAPATAN ISI RUMAH** RM:_____	
10.	**Sepanjang tempoh setahun yang lalu, adakah pakcik/makcik pernah dimasukkan ke dalam wad (hospitalisasi)?** 1. ☐ Tidak 2. ☐ Ya (sila nyatakan: Berapa kali ……..) Apakah sebab-sebab Pakcik/makcik dimasukkan ke hospital?	

BAHAGIAN B: LAPORAN KENDIRI PENYAKIT KRONIK

ARAHAN: Sila tandakan (/) pada jawapan yang berkenaan

Penyakit Kronik	**1.Ya**	**2.Tidak**	**Mengikuti rawatan susulan di klinik kesihatan/hospital**	**Di bawah preskripsi ubat**
Penyakit kardiovaskular(termasuk penyakit jantung dan strok)				
Penyakit kronik pernafasan (termasuk COPD dan asma)				
Kencing manis				
Kanser				
Tekanan Darah Tinggi				
Penyakit buah pinggang				
Penyakit usus				
Gout/arthritis				
Lain-lain. **Nyatakan:** _____ ***Others (please specify)***				

KOD RESPONDEN:

BAHAGIAN C: KEMURUNGAN

Malay Geriatic Depression Scale-15 (Teh & Hasanah, 2004)

ARAHAN: Sila tandakan (/) pada jawapan yang berkenaan

Pilih jawapan terbaik sekiranya anda mengalami simtom dibawah sejak minggu lalu

Soalan	**1. Ya**	**2.Tidak**
1. Adakah anda berpuas hati dengan kehidupan anda?		
2. Adakah kegiatan harian anda semakin berkurangan?		
3. Adakah anda berasa kehidupan anda tidak bermakna?		
4. Adakah anda selalu berasa jemu atau bosan?		
5. Adakah anda selalu dalam keadaan ceria?		
6. Adakah anda berasa bimbang sesuatu yang tidak baik akan berlaku pada diri anda?		
7. Adakah anda berasa gembira selalu?		
8. Adakah anda selalu berasa tidak berupaya?		
9. Adakah anda lebih suka duduk d rumah sahaja daripada keluar dan mencuba sesuatu yang baru?		
10. Adakah anda rasa bermasalah dari segi ingatan berbanding dengan orang lain?		
11. Adakah anda berasa bertuah dengan kehidupan sekarang?		
12. Adakah anda ka dang-kadang merasa diri anda sudah tidak berguna?		
13. Adakah anda rasa penuh bertenaga?		
14. Adakah anda merasa tiada harapan dengan keadaan sekarang?		
15. Adakah anda rasa keadaan orang lain lebih baik daripada anda?		
Total Score :		

Skala Skor M-GDS:
Score 0-5 = Normal
Score > 5 berisiko mengalami kemurungan

BAHAGIAN D: PENILAIAN AKTIVITI KEHIDUPAN SEHARIAN

Modified barthel index–Malay Version (BI-MV), (Mahoney & Barthel, 1965 ; Ministry of Health,2009)

ARAHAN: Sila tandakan (/) pada jawapan yang berkenaan

Soalan	Berdikari Sepenuhnya	Berdikari Dengan Peralatan	Perlukan Bantuan	Tidak Boleh Melakukan Aktiviti	Skor
1. Minum Menggunakan Cawan	4	2	0	0	
2. Makan	6	3	0	0	
3. Pakai Baju	5	5	3	0	
4. Pakai Seluar	5	5	2	0	
5. Memasang Brace (Anggota Palsu)	0	0	2	0	
6. Cara Kebersihan Diri	5	5	0	0	
7. Mandi / Bersihkan Diri	4	4	0	0	
8. Mengawal Pembuangan Air Kecil	10	10	5	0	

KOD RESPONDEN:

9. Mengawal Pembuangan Air Besar	**10**	**10**	**5**	**0**	
10. Membersih Kemaluan / Pakaian Di Tandas	**4**	**4**	**2**	**0**	
MOBILITI					
11. Bangun & Duduk Kerusi	**15**	**15**	**7**	**0**	
12. Bangun & Duduk Tandas	**6**	**5**	**3**	**0**	
13. Masuk & Keluar Bilik Mandi	**1**	**1**	**0**	**0**	
14. Naik & Turun Tangga (6-10 anak tangga)	**10**	**10**	**5**	**0**	
15. Jika Tidak Boleh Berjalan Penyelenggaraan Kerusi Roda	**15**	**5**	**0**	**N/A**	
Jumlah Skor :					
Skala skor BI: **Skor 0-24 = total dependent** **Skor 25-49 = severe dependent** **Skor 50-74 = moderate dependent** **Skor 75-89 = mild dependent** **Skor 90-99 = minimal dependent**					

KOD RESPONDEN:

BAHAGIAN E: RISIKO TERJATUH

21-ITEM FALL RISK INDEX (FRI-21), (The Working Group for Fall Prevention in the Japanese Ministry of Health, Welfare and Labor)

		1. YA	0. TIDAK
1.	Saya tersandung kaki kadang-kala.		
2.	Saya tidak mampu menaiki dan menuruni tangga tanpa memegang susur tangan tangga.		
3.	Kelajuan berjalan saya bertambah perlahan.		
4.	Saya tidak mampu melintas jalan ketika lampu sedang menyala hijau.		
5.	Saya tidak mampu berjalan 1km dalam satu masa.		
6.	Saya tidak mampu berdiri dengan satu kaki selama 5 saat.		
7.	Saya menggunakan tongkat.		
8.	Saya tidak mampu memerah tuala dengan kuat.		
9.	Saya mengalami pening kepala atau berdenyut.		
10.	Belakang badan saya telah mengalami sedikit bongkok		
11.	Saya mengalami sakit lutut.		
12.	Saya mengalami masalah penglihatan.		
13.	Saya mengalami masalah pendengaran.		
14.	Saya mengalami masalah pelupa.		
15.	Saya mengalami perasaan takut terjatuh.		
16.	Saya mengambil 5 atau lebih berlainan jenis ubat setiap hari.		
17.	Saya merasakan penglihatan saya kabur ketika berjalan di dalam rumah.		
18.	Terdapat halangan (risiko berjalan) di ruang tamu atau pintu masuk rumah.		
19.	Terdapat perbezaan paras permukaan lantai di dalam rumah.		
20.	Saya perlu menggunakan tangga.		
21.	Saya melalui permukaan lereng yang curam berdekatan rumah setiap hari.		
Skor : 0-9 = Risiko rendah untuk terjatuh 9-10 = Risiko sederhana untuk terjatuh 10-21 = Risiko tinggi untuk terjatuh			
	Jumlah Skor:	/21	

KOD RESPONDEN:

BAHAGIAN F: UJIAN STATUS FUNGSIAN

Instrumental Activity Daily Living –Malay Version (IADL-MV), (Lawton & Brody, 1969)

ARAHAN: Sila tandakan (/) pada jawapan yang berkenaan

Soalan		Skor
16.Adakah anda boleh menggunakan telefon?		
a) ☐ Tidak menggunakan telefon langsung	0	
b) ☐ Menjawab telefon tetapi tidak mendail	1	
c) ☐ Mendail beberapa nombor yang dikenali	1	
d) ☐ Menggunakan telefon atas inisiatif sendiri; cari dan dail	1	
17.Adakah anda boleh keluar membeli barang keperluan harian (sekiranya anda ada kemudahan pengangkutan)?		
a) ☐ Tidak mampu langsung untuk membeli-belah	0	
b) ☐ Perlukan teman untuk membeli-belah	0	
c) ☐ Membeli sendiri bagi pembelian kecil	0	
d) ☐ Membeli-belah sendiri	1	
18.Adakah anda boleh menyediakan makanan sendiri?		
a) ☐ Makanan perlu disediakan dan dihidangkan	0	
b) ☐ Memanaskan dan menghidangkan makanan atau menyediakan makanan tetapi tidak mengikut diet mencukupi	0	
c) ☐ Menyediakan makanan mencukupi jika bahan diberi	0	
d) ☐ Merancang, menyedia, dan menghidang makanan yang mencukupi sendiri	1	
19.Adakah anda boleh melakukan kerja-kerja rumah?		
a) ☐ Tidak mengambil bahagian dalam kerja-kerja mengurus rumah	0	
b) ☐ Perlukan bantuan dalam kerja-kerja mengurus rumah	1	
c) ☐ Melakukan tugas harian ringan, tetapi tidak mengikut tahap kebersihan yang dapat diterima	1	
d) ☐ Melakukan tugas harian ringan seperti membasuh pinggan, mengemas tempat tidur	1	
e) ☐ Mengurus rumah sendiri dengan dibantu sesekali (kerja berat)	1	
20.Adakah anda boleh membasuh pakaian sendiri?		
a) ☐ Semua pakaian kotor dibasuh oleh orang lain	0	
b) ☐ Membasuh sendiri pakaian yang kecil, membilas stoking, dll	1	
c) ☐ Membasuh sendiri baju	1	
21.Bolehkah anda pergi ke suatu tempat yang jauh (lebih 100 m) contohnya jarak 5 buah rumah teres?		
a) ☐ Tidak bergerak sama sekali	0	
b) ☐ Bergerak menggunakan teksi atau kereta dengan dibantu orang lain	0	
c) ☐ Bergerak menggunakan pengangkutan awam jika dibantu orang lain	1	
d) ☐ Bergerak sendiri menggunakan teksi, tetapi bukan pengangkutan awam lain	1	

KOD RESPONDEN:

e) ☐ Bergerak sendiri menggunakan pengangkutan awam atau memandu kereta sendiri	1	
22. Adakah anda boleh mengambil ubat sendiri?		
a) ☐ Tidak mampu untuk memakan ubat sendiri	0	
b) ☐ Bertanggungjawab jika ubat disediakan terlebih dahulu dalam dos berasingan	0	
c) ☐ Boleh mengambil ubat mengikut dos/sukatan yang betul pada masa yang betul	1	
23. Di dalam menguruskan wang, adakah anda		
a) ☐ Tidak berkemampuan untuk menguruskan wang sendiri	0	
b) ☐ Mengurus pembelian harian, tetapi perlukan bantuan parbankan, belian besar	1	
c) ☐ Mampu menguruskan wang sendiri termasuk urusan pembayaran bil	1	
Jumlah Skor :		

Skala skor IADL:

Skor 0-7 = Masalah status fungsian *(functional disability)*

Skor 8 = Normal

KOD RESPONDEN:

BAHAGIAN G: STATUS KOGNITIF

Malay Version Mini-Mental State Examination-S (M-MMSE-S), (Folstein, Folstein, & McHugh, 1975; Ibrahim et al., 2009)

ARAHAN: Sila tandakan ☑ pada ruang skor yang disediakan

1.	**Orientasi masa**	
a.	Hari ini hari apa?	0. ☐ Salah 1. ☐ Betul
b.	Hari ini berapa hari bulan?	0. ☐ Salah 1. ☐ Betul
c.	Bulan ini bulan apa?	0. ☐ Salah 1. ☐ Betul
d.	Tahun berapakah tahun ini?	0. ☐ Salah 1. ☐ Betul
e.	Sekarang lebih kurang pukul berapa?	0. ☐ Salah 1. ☐ Betul
2.	**Orientasi tempat**	
a.	Di negara manakah anda berada sekarang?	0. ☐ Salah 1. ☐ Betul
b.	Di negeri manakah anda berada sekarang?	0. ☐ Salah 1. ☐ Betul
c.	Di bandar manakah anda berada sekarang?	0. ☐ Salah 1. ☐ Betul
d.	Di bangunan manakah anda berada sekarang?	0. ☐ Salah 1. ☐ Betul
e.	Di tingkat berapakah anda berada anda berada sekarang?	0. ☐ Salah 1. ☐ Betul

3. Pendaftaran Ingatan

Arahan: Sila dengar dengan teliti, saya akan sebutkan tiga (3) perkataan dan saya mahu anda menyebutnya kembali selepas saya selesai menyebutnya.

EPAL KUCING MEJA

Arahan: Sekarang sebutkan perkataan-perkataan itu

☐ EPAL ☐ KUCING ☐ MEJA

Arahan: Sila ingat perkataan-perkataan ini, kerana saya akan tanya anda lagi dalam beberapa minit nanti.

4. Tumpuan perhatian dan pengiraan:

KOD RESPONDEN:

Pilihan 2

Arahan: Cuba mengeja secara terbalik perkataan DUNIA

☐ A
☐ I
☐ N
☐ U
☐ D

5. Mengingat:

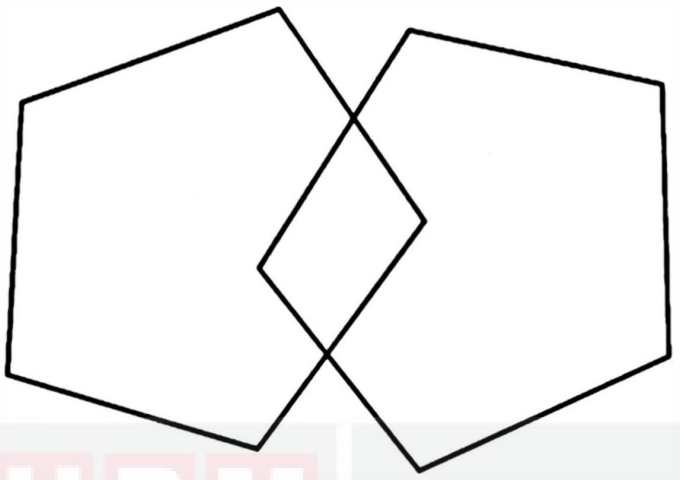
Arahan: Apakah yang saya minta anda ingatkan tadi?

☐ EPAL ☐ KUCING ☐ MEJA

6. Bahasa

a.	Apakah objek yang saya pegang ini (pen)?	0. ☐ Salah 1. ☐ Betul
b.	Apakah objek yang saya pakai ini (jam tangan)?	0. ☐ Salah 1. ☐ Betul
c.	Ulangi perkataan ini (Tidak mungkin dan cukup mustahil)	0. ☐ Salah 1. ☐ Betul
d.	**Sila ikut arahan:** Ambil kertas ini dengan tangan kanan, kemudian lipatkan kepada dua dan kemudiannya letakkan di atas meja.	0. ☐ Tidak dapat membuat seperti arahan sepenuhnya 1. ☐ Ambil kertas dengan tangan kanan 2. ☐ Ambil kertas dengan tangan kanan dan melipat kertas 3. ☐ Dapat membuat seperti arahan sepenuhnya (Ambil kertas dengan tangan kanan, lipst kepada dua dan letakkan di atas meja)
e.	**Baca dan lakukan arahan ini:** ***TUTUP MATA ANDA***	0. ☐ Salah 1. ☐ Betul
f.	**Baca dan lakukan arahan ini:** ***TULISKAN SEPOTONG AYAT:*** _____ _____	0. ☐ Salah 1. ☐ Betul

KOD RESPONDEN:

7	**Sila lukis bentuk ini:** 	
	Sila lukis di ruangan ini:	
	Mempunyai sepuluh (10) sudut dan bertindih	**0. ☐ Salah 1. ☐ Betul**
	Jumlah Skor :	**/30**

Skala skor kriteria Malay-MSE-S:
Skor >18 = *Normal*
Skor ≤ 17 = *Masalah kognitif*

KOD RESPONDEN:

BAHAGIAN B : RISIKO MALPEMAKANAN

Mini Nutritional Assessment (MNA)

ARAHAN: Sila tandakan ☐/ pada jawapan yang berkenaan

	Soalan	**Skor**
1.	**Adakah pengambilan makanan anda berkurangan sejak 3 bulan lalu akibat kehilangan selera makan, masalah penghadaman makanan atau mempunyai kesukaran untuk mengunyah atau menelan?** 0 = Kehilangan selera yang teruk 1 = Kehilangan selera yang sederhana 2 = Tidak kehilangan selera	
2.	**Kehilangan berat badan sejak tiga bulan lalu** 0 = Lebih daripada 3 kg berat badan 1 = Kurang pasti 2 = Hilang 1-3 kg berat badan 3 = Tiada kehilangan berat badan	
3.	**Mobiliti** 0 = Terbatas di atas katil atau kerusi 1 = Mampu bangun dari tempat tidur atau kerusi tetapi mengalami kesukaran untuk keluar rumah 2 = Mampu untuk keluar rumah	
4.	**Mengalami tekanan psikologi ATAU penyakit akut dalam 3 bulan lalu** 0 = Ya 2 = Tidak	
5.	**Gangguan Neuropsikologi** 0 = Kemurungan atau demensia yang teruk 1 = Demensia yang ringan 2 = Tidak mengalami masalah psikologi	
6.	*****SILA TINGGALKAN SOALAN INI***** **Indeks Jisim Tubuh kg/m^2** 0 = BMI kurang daripada 19 kg/m^2 1 = BMI 19 – 21 kg/m^2 2 = BMI 21- 23 kg/m^2 3 = BMI melebihi 23 kg/m^2	
	Jumlah Skor : ☐	**/14**

Skala Skor MNA:

12 - 14 = Normal

8 - 11 = Berisiko mempunyai malpemakanan

0 - 7 = Malpemakanan

KOD RESPONDEN:

BAHAGIAN I: STATUS *FRAILTY*

Frailty phenotype, (Fried et al., 2001)

ARAHAN: Sila tandakan / pada ruang jawapan yang disediakan

Soalan	**Kriteria *Frailty***
1. Kehilangan / penyusutan berat badan: a) Sepanjang 6 bulan yang lepas, adakah BMI pakcik/makcik kurang daripada 18.5 kg/m²? 0. ☐ Ya 1. ☐ Tidak b) Sepanjang 6 bulan yang lepas, adakah pakcik/makcik telah mengalami kesusutan berat badan secara tidak dirancang (bukan disebabkan oleh diet atau senaman) lebih daripada 10 paun (4.5kg)? 0. ☐ Ya 1. ☐ Tidak Subjek yang memilih **jawapan "0"** untuk salah satu daripada **soalan (a) atau (b)**, mempunyai kriteria *frailty*. Jika ada, tandakan / pada ruang kriteria *frailty* di sebelah. *(Ng et al., 2015).*	
2. Keletihan: Sepanjang minggu lepas, berapa kerapkah pakcik/makcik merasakan keadaan berikut? a) Rasa kesukaran apabila ingin melakukan sesuatu 0. ☐ Jarang/ tiada (1 hari) 1. ☐ Kadang-kadang (1-2 hari) 2. ☐ Kerapkali (3-4 hari) 3. ☐ Pada setiap masa (5-7 hari) b) Menghadapi masalah untuk meneruskan kehidupan 0. ☐ Jarang/ tiada (1 hari) 1. ☐ Kadang-kadang (1-2 hari) 2. ☐ Kerapkali (3-4 hari) 3. ☐ Pada setiap masa (5-7 hari) Subjek yang memilih **jawapan "2" atau "3"** untuk salah satu daripada **soalan (a) atau (b)**, mempunyai kriteria *frailty (Fairhall et al., 2008; Radloff, 1977)*. Jika ada, tandakan / pada ruang kriteria *frailty* di sebelah.	
Kelemahan otot: Kekuatan genggaman tangan (kg) pada tangan dominan menggunakan ***Jamar Hand Dynamometer*** Penentu untuk kekuatan genggaman (kg): **Lelaki** — **Perempuan** ≤30kg — 0.☐ ≤18kg ≥31kg — 1.☐ ≥18kg	

KOD RESPONDEN:

Subjek lelaki atau perempuan yang mempunyai **jawapan "0"**, mempunyai kriteria *frailty* *(Fairhall et al., 2008; Fried et al., 2001)*. Jika ada, tandakan / pada ruang kriteria *frailty* di sebelah.	
4. Kepantasan berjalan: Tempoh masa (saat) yang diambil ***menggunakan jam randik*** untuk berjalan sepanjang 4 meter (13.12 kaki): _____ saat Subjek yang mempunyai tempoh masa **≥6 saat** untuk berjalan sepanjang 4 meter, mempunyai kriteria *frailty (Fairhall et al., 2008)*. Jika ada, tandakan / pada ruang kriteria *frailty* di sebelah.	
5. Kurang aktiviti fizikal: ***SILA TINGGALKAN SOALAN INI**** *Berdasarkan PASE-M skor*	
Jumlah skor kriteria *frailty*	/5
Skala skor kriteria *frailty*: ≥3 kriteria *frailty* = *Frail* 1 – 2 kriteria *frailty* = *Pre-frail* 0 kriteria *frailty* = Normal	

KOD RESPONDEN:

BAHAGIAN J: TAHAP AKTIVITI FIZIKAL

Physical Activity Scale for the Elderly-Malay version (PASE-M), (Ismail et al., 2015)

ARAHAN: Sila tandakan ☐ pada jawapan yang berkenaan

AKTIVITI MASA LAPANG

1 Dalam tempoh 7 hari yang lepas, berapa kerapkah anda melakukan aktiviti dalam keadaan duduk (cth: membaca, menonton TV atau melakukan kraftangan)?

0. ☐ Tidak pernah **(Terus ke soalan 2)**
1. ☐ Jarang (1-2 hari)
2. ☐ kadang-kadang (3-4 hari)
3. ☐ Selalu (5-7 hari)

Apakah aktiviti-aktiviti ini? Senaraikan:

_____

_____

Secara purata, berapa jam dalam sehari anda terlibat dalam aktiviti keadaan duduk tersebut?

1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥4 jam

Dalam tempoh 7 hari yang lepas, berapa kerapkah anda berjalan di luar rumah atau halaman rumah atas apa jua sebab (cth: untuk bersenang-senang atau sebagai senaman, berjalan ke tempat kerja, membeli-belah, berjalan bersama cucu atau berjalan bersama binatang peliharaan seperti anjing)?

0. ☐ Tidak pernah **(Terus ke soalan 3)**
1. ☐ Jarang (1-2 hari)
2. ☐ kadang-kadang (3-4 hari)
3. ☐ Selalu (5-7 hari)

Apakah aktiviti-aktiviti ini? Senaraikan:

_____

_____

Secara purata, berapa jam dalam sehari anda terlibat dalam aktiviti keadaan tersebut?

1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥4 jam

Dalam tempoh 7 hari yang lepas, berapa kerapkah anda melibatkan diri dalam aktiviti sukan intensiti ringan dan rekreasi (cth: boling, bermain golf menggunakan kereta golf, senaman rengangan, tai chi, memancing, menyanyi, bermain alat-alat muzik atau seumpamanya)?

0. ☐ Tidak pernah **(Terus ke soalan 4)**
1. ☐ Jarang (1-2 hari)
2. ☐ kadang-kadang (3-4 hari)
3. ☐ Selalu (5-7 hari)

Apakah aktiviti-aktiviti ini? Senaraikan:

_____

_____

KOD RESPONDEN: | | | | | |

	Secara purata, berapa jam dalam sehari anda terlibat dalam aktiviti keadaan tersebut? 1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥4 jam
4	Dalam tempoh 7 hari yang lepas, berapa kerapkah anda melibatkan diri dalam aktiviti sukan intensiti sederhana atau rekreasi yang kurang lasak (cth: tenis secara beregu, bermain golf tanpa memandu kereta golf, menari, bermain bola lisut atau seumpamanya)? 0. ☐ Tidak pernah **(Terus ke soalan 5)** 1. ☐ Jarang (1-2 hari) 2. ☐ kadang-kadang (3-4 hari) 3. ☐ Selalu (5-7 hari) Apakah aktiviti-aktiviti ini? Senaraikan: _____ _____ Secara purata, berapa jam dalam sehari anda terlibat dalam aktiviti keadaan tersebut? 1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥4 jam
5	Dalam tempoh 7 hari yang lepas, berapa kerapkah anda melibatkan diri dalam aktiviti sukan lasak atau riadah (cth: berjoging, mendaki bukit, bermain bola sepak, tenis perseorangan, menaiki tangga, tarian aerobik, berenang, berbasikal atau seumpamanya)? 0. ☐ Tidak pernah **(Terus ke soalan 6)** 1. ☐ Jarang (1-2 hari) 2. ☐ kadang-kadang (3-4 hari) 3. ☐ Selalu (5-7 hari) Apakah aktiviti-aktiviti ini? Senaraikan: _____ _____ Secara purata, berapa jam dalam sehari anda terlibat dalam aktiviti keadaan tersebut? 1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥4 jam
6	Dalam tempoh 7 hari yang lepas, berapa kerapkah anda melakukan senaman khusus untuk meningkatkan kekuatan otot dan daya tahan (cth: mengangkat berat, melakukan tekan tubi dan seumpamanya)? 0. ☐ Tidak pernah **(Terus ke soalan 7)** 1. ☐ Jarang (1-2 hari) 2. ☐ kadang-kadang (3-4 hari) 3. ☐ Selalu (5-7 hari) Apakah aktiviti-aktiviti ini? Senaraikan: _____ _____ Secara purata, berapa jam dalam sehari anda terlibat dalam aktiviti keadaan tersebut?

KOD RESPONDEN:

	1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥4 jam	
AKTIVITI KERJA RUMAH		
7	Dalam tempoh **7 hari yang lepas**, adakah anda melakukan sebarang kerja rumah yang ringan (cth: mencuci pinggan mangkuk, menyapu lantai atau membersihkan debu)?	0. ☐ Tidak 1. ☐ Ya
8	Dalam tempoh **7 hari yang lepas**, adakah anda melakukan sebarang kerja rumah yang berat (cth: menyental lantai, mengelap tingkap, memvakum)?	0. ☐ Tidak 1. ☐ Ya
9a	Dalam tempoh **7 hari yang lepas,** adakah anda terlibat dalam aktiviti membaik pulih rumah (cth: mengecat rumah, memasang kertas dinding, kerja-kerja membaiki elektrik dan seumpamanya)?	0. ☐ Tidak 1. ☐ Ya
9b	Dalam tempoh **7 hari yang lepas**, adakah anda terlibat dalam aktiviti penjagaan halaman rumah (cth: memotong rumput, membersihkan dedaun, memotong kayu, menanam bunga dan sebagainya)?	0. ☐ Tidak 1. ☐ Ya
9c	Dalam tempoh **7 hari yang lepas**, adakah anda terlibat dalam aktiviti berkebun di luar rumah?	0. ☐ Tidak 1. ☐ Ya
9d	Dalam tempoh **7 hari yang lepas**, adakah anda terlibat dalam penjagaan orang lain (cth: menjaga pasangan sendiri, kanak-kanak, atau orang dewasa lain)?	0. ☐ Tidak 1. ☐ Ya
AKTIVITI BERKAITAN PEKERJAAN		
10	Dalam tempoh 7 hari yang lepas, adakah anda bekerja secara bergaji atau sukarelawan? 0. ☐ Tidak **(Soalan tamat)** 1. ☐ Ya Berapa jam dalam seminggu anda bekerja secara makan gaji atau sukarelawan? _____ jam Antara kategori berikut yang manakah menerangkan dengan tepat jumlah aktiviti fizikal yang diperlukan di tempat kerja anda dan/ atau kerja sukarela anda? 1. ☐ Kebanyakan waktu adalah duduk dengan melibatkan sedikit pergerakan tangan (pekerja pejabat, pembaiki jam, pekerja kilang yang bekerja sambal duduk, pemandu bas) 2. ☐ Duduk atau berdiri dengan sedikit pergerakan berjalan (juruwang, pekerja am pejabat, pekerja operasi jentera) 3. ☐ Berjalan dengan pengendalian bahan dengan berat kurang 23kg (posmen, pelayan restoran, pekerja binaan, pekerja operasi jentera dan alat berat) 4. ☐ Berjalan dan kerja manual yang berat sering memerlukan pengendalian bahan-bahan berat lebih 23kg (pembalak, tukang batu, pekerja lading, buruh am)	