



UNIVERSITI PUTRA MALAYSIA

***PREVALENCE OF SARCOPENIA AND ITS FACTORS ASSOCIATED
AMONG COMMUNITY-DWELLING ELDERLY IN PPR FLATS KUALA
LUMPUR.***

WAN HYSSNA BINTI WAN OMAR

**lp
FPSK3 2020 39**

APPROVAL

This project entitled “Prevalence of sarcopenia and its factors associated among community-dwelling elderly in PPR flats Kuala Lumpur was prepared by Wan Hyssna binti Wan Omar and submitted to the Faculty of Medicine and Health Sciences as a 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.



Received and examine by:

Assoc. Prof. Dr. Siti Nur'Asyura Adznam

Department of Nutrition and Dietetics

Faculty of Medicine and Health Sciences

Universiti Putra Malaysia

Date: _____

DECLARATION

I am hereby declared that this thesis report is based on my original work except for quotations and citations which have been acknowledge to the corresponded authors.

Wan Hyssna binti Wan Omar

Matric number: 190505

Bachelor of Science (Nutrition and Community Health)

Department of Nutrition and Dietetics

Faculty of Medicine and Health Sciences

Universiti Putra Malaysia

Date: _____

ACKNOWLEDGEMENT

First and foremost, I would like to express my greatest appreciation and gratitude to my research supervisors, Assoc. Prof. Dr. Siti Nur 'Asyura Adznam. Without her assistance and dedicated involvement in every step throughout the process, this project would have never been successfully accomplished. Her encouragement and spirit also was the momentum to drive me in completing this project even though a lot of difficulties and problems ahead.

Next, I would like to dedicate my appreciation to the leader of committee club association in each *Projek Perumahan Rakyat* (PPR) in Kuala Lumpur for the cooperation in helping me during the data collection. Without their cooperation and approval, this project also would have never been successfully achieved. Other than that, not to forget the involvement of the respondents was really appreciated.

I would also like to thank my project's partner, Nur Najatul Munirah Muhamad Bokery, postgraduate students, Camilla Wahida Norazman and Nurul Izzati Mohd Suffian, Dietetics 3rd year students, Siti Nur Amirah Mohd Adnan and Mohamad Aiman Kamarol Azizi, all my coursemates, 4th Year of Nutrition and Community Health and my fellow friends for their help and supports indirectly or directly in completion of this project. Lastly, I would like to extend my deepest appreciation to my family members, for moral support and encouragement given from beginning of the process.

Thank you.

TABLE OF CONTENTS

CONTENTS	PAGE
APPROVAL	ii
DECLARATION	iii
ACKNOWLEDGEMENTS	iv
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF APPENDICES	x
ABSTRACT	xi
ABSTRAK	xii
CHAPTER 1 INTRODUCTION	
1.1 Background	1
1.2 Problem statements	4
1.3 Significance of the study	5
1.4 Research Objectives	
1.4.1 General objectives	6
1.4.2 Specific objectives	6
1.5 Research hypothesis	6
1.6 Conceptual framework	6
CHAPTER 2 LITERATURE REVIEW	
2.1 Sarcopenia and its prevalence among elderly population	10
2.2 Factors associated with sarcopenia among elderly population	
2.2.1 Socio-demographic	12
2.2.2 Body composition	14
2.2.3 Physical activity	15
2.2.4 Nutritional status	17
2.2.5 Functional status	18

CHAPTER 3 METHODOLOGY

3.1	Study design	20
3.2	Study location	20
3.3	Study sample	21
3.4	Sample size	21
3.5	Sampling design	22
3.6	Study instruments	24
3.6.1	Socio-demographic	24
3.6.2	Body composition	24
3.6.3	Physical activity	26
3.6.4	Nutritional status	27
3.6.4.1	Malnutrition	
3.6.4.2	Dietary intake	
3.6.5	Functional status	28
3.6.6	Sarcopenia status	28
3.7	Study approval	30
3.8	Pre-test	31
3.9	Data collection	31
3.10	Statistical analysis	33

CHAPTER 4 RESULTS

4.1	Socio-demographic	34
4.2	Body composition	
4.2.1	Body weight status	34
4.2.2	Body fat percentage	36
4.2.3	Mid-upper arm circumference and calf circumference	36
4.3	Physical activity	38
4.4	Nutritional status	
4.4.1	Malnutrition	38
4.4.2	Dietary intake	39
4.5	Functional status	41
4.6	Sarcopenia	42
4.6.1	Association between socio-demographic and sarcopenia status	44
4.6.2	Association between body composition and sarcopenia status	46
4.6.3	Association between physical activity and sarcopenia status	47
4.6.4	Association between nutritional and sarcopenia status	
4.6.4.1	Malnutrition and sarcopenia status	47
4.6.4.2	Dietary intake and sarcopenia status	48
4.6.5	Association between functional and sarcopenia status	50

CHAPTER 5 DISCUSSION

5.1	Socio-demographic	51
5.2	Body composition	
5.2.1	Body weight status	52
5.2.2	Body fat percentage	53
5.2.3	Mid-upper arm circumference and calf circumference	53
5.3	Physical activity	54
5.4	Nutritional status	
5.4.1	Malnutrition	55
5.4.2	Dietary intake	55
5.5	Functional status	57
5.6	Sarcopenia	
5.6.1	Association between socio-demographic and sarcopenia status	58
5.6.2	Association between body composition and sarcopenia status	61
5.6.3	Association between physical activity and sarcopenia status	62
5.6.4	Association between nutritional and sarcopenia status	
5.6.4.1	Malnutrition and sarcopenia status	63
5.6.4.2	Dietary intake and sarcopenia status	63
5.6.5	Association between functional and sarcopenia status	64
CHAPTER 6		
6.1	Conclusion	65
6.2	Limitation of study	66
6.2	Recommendations	66
REFERENCES		68
APPENDICES		75

LIST OF TABLES

Table 3.1: Inclusion and exclusion criteria for subject of the study	21
Table 3.2: Correlation coefficient calculation based on previous study to calculate the sample size.	22
Table 3.3: Classification of BMI (WHO, 2004)	25
Table 3.4: Classification of body fat percentage for adults (Lee & Nieman, 2003)	25
Table 3.5: Mid-upper arm circumference (Sakinah et al., 2010)	26
Table 3. 6: Calf circumference (Sakinah et al. 2004)	26
Table 3.7: Scoring for Mini Nutritional Assessment-Short Form (MNA-SF)	27
Table 3. 8: Scoring for IADL (Lawton & Btody, 1969)	28
Table 3.9: Classification of muscle mass (<i>kgm</i> ²) based on AWGS (2014)	30
Table 4.10: Results of chi-square test of independence of association between socio-demographic and sarcopenia status.	45
Table 4.11: Results of chi-square test of independence of association between body composition and sarcopenia status.	46
Table 4.12: Results of chi-square test of independence of association between physical activity and sarcopenia status.	47
Table 4.13: Results of chi-square test of independence of association between malnutrition and sarcopenia status.	48
Table 4.14: Results of chi-square test of independence of association between dietary intake and sarcopenia status.	49
Table 4.15: Results of chi-square test of independence of association between functional and sarcopenia status.	50

LIST OF FIGURES

Figure 1.1: Conceptual framework of this study	9
Figure 3.2: Diagnostic algorithm of Asian Working Group for Sarcopenia (AWGS) 2014	30
Figure 3.3 Flow chart of data collection	32
Figure 4.1 Diagnostic algorithm of Asian Working Group for Sarcopenia (AWGS) 2014	43



LIST OF APPENDICES

APPENDICES	CONTENTS	PAGE
Appendix I	Research consent to DBKL	75
Appendix II	Approval letter from DBKL	76
Appendix III	Approval letter from JKEUPM	77
Appendix IV	Research consent to PPR Batu Muda	78
Appendix V	Research paper work PPR Batu Muda	80
Appendix VI	Research consent to PPR Seri Semarak 2	86
Appendix VII	Research paper work PPR Seri Semarak 2	88
Appendix VIII	Research consent to PPR Kg. Muhibbah	94
Appendix IX	Research paper work PPR Kg. Muhibbah	96
Appendix X	Subject information sheet & informed consent	103
Appendix XI	Research questionnaire form	107

ABSTRACT

**PREVALENCE OF SARCOPENIA AND ITS FACTORS ASSOCIATED AMONG
COMMUNITY-DWELLING ELDERLY IN PPR FLATS KUALA LUMPUR.**

Sarcopenia is a syndrome characterized by progressive and generalized loss of skeletal muscle mass and strength which results in physical disability, poor quality of life and mortality. Sarcopenia is a common geriatric syndrome which related with ageing process. Previous studies have reported a high prevalence of sarcopenia and its associated factors among elderly population but limited in determined sarcopenia based on Asian Working Group on Sarcopenia (AWGS) 2014 criterion. Therefore, this cross-sectional study aimed to determine the prevalence of sarcopenia and its factors associated among community-dwelling elderly in *Projek Perumahan Rakyat* (PPR) flats Kuala Lumpur (KL). A total of 82 respondents from 3 PPR in KL with a mean age of 67.84 ± 5.18 years old were randomly selected to participate in this study. Criteria of AWGS 2014 was used to identify the presence of sarcopenia. Self-administered questionnaire and face-to-face interview were used to obtain socio-demographic background, physical activity (Physical Activity Scale for the Elderly-Malay version) (PASE-M), malnutrition status (Mini-Nutritional Assessment-Short Form) (MNA-SF), dietary intake (Diet History Questionnaire) (DHQ) and functional status (Instrumental Activity Daily Living-Malay version) (IADL-MV). Body composition by measure anthropometric including body mass index, body fat percentage, mid-upper arm circumference, calf circumference, muscle mass, hand grip strength and gait speed were obtained. Results showed that more than half community-dwelling elderly (53.7%) had sarcopenia in PPR KL. Ethnicity ($\chi^2=4.097$, $p=0.043$) and BMI ($\chi^2=30.582$, $p=0.000$) were significantly associated with sarcopenia. However, there was no association found between physical activity ($\chi^2=1.358$, $p=0.244$), malnutrition status ($\chi^2=3.776$, $p=0.052$), dietary intake ($p>0.05$) and functional status ($\chi^2=3.198$, $p=0.074$) with sarcopenia. As conclusion, sarcopenia is higher among community-dwelling elderly in PPR KL. Future studies are recommended larger sample size in order to generalize for the whole elderly population in KL by using AWGS 2014 criterion.

ABSTRAK

PREVALENS SARKOPENIA DAN FAKTOR-FAKTOR BERKAITAN DALAM KALANGAN WARGA EMAS DI PPR KUALA LUMPUR

Sarkopenia adalah satu sindrom yang dicirikan oleh kehilangan yang progresif rangka jisim otot dan kekuatannya dan seterusnya mengakibatkan ketidakupayaan fizikal, kualiti hidup yang lemah dan kematian. Sarkopenia adalah sindrom geriatrik yang biasa dikaitkan dengan proses penuaan. Kajian terdahulu melaporkan warga emas berkecenderungan mendapat sarkopenia dan faktor-faktor yang berkaitan dengannya. Namun demikian, penggunaan Asian Working Group on Sarcopenia (AWGS) 2014 dalam mengenal pasti status sarcopenia pada kajian terdahulu adalah terhad. Justeru, kajian ini dijalankan untuk mengenal pasti prevalens sarkopenia dan faktor-faktor yang berkaitan dengannya dalam kalangan warga emas di Projek Perumahan Rakyat (PPR) Kuala Lumpur (KL). Sebanyak 82 responden dari 3 PPR di KL dengan purata umur 67.84 ± 5.18 tahun telah dipilih secara rawak untuk menyertai kajian ini. Kriteria AWGS 2014 digunakan untuk mengenalpasti kehadiran sarcopenia dalam kajian ini. Soal selidik yang ditadbir sendiri dan temubual bersemuka telah digunakan untuk mendapatkan latar belakang sosio-demografi, aktiviti fizikal (Physical Activity Scale for the Elderly-Malay version) (PASE-M), malpemakan (Mini-Nutritional Assessment-Short Form) (MNA-SF), pengambilan makanan (Sejarah Pemakanan Berstruktur) dan status kefungsian (Instrumental Activity Daily Living-Malay version) (IADL-MV). Komposisi badan yang melibatkan pengukuran antropometrik termasuk indeks jisim badan, peratusan lemak badan, lilitan pertengahan lengan, lilitan betis, jisim otot, kekuatan genggam tangan dan kelajuan berjalan telah diperolehi. Hasil kajian menunjukkan bahawa lebih daripada separuh warga emas yang tinggal di komuniti (53.7%) mempunyai sarkopenia di PPR KL. Etnik ($\chi^2=4.097$, $p=0.043$) dan BMI ($\chi^2=30.582$, $p=0.000$) dikaitkan secara signifikan dengan status sarkopenia. Walau bagaimanapun, tidak terdapat hubungan kait antara aktiviti fizikal ($\chi^2=1.358$, $p=0.244$), malnutrisi ($\chi^2=3.776$, $p=0.052$), pengambilan makanan ($p>0.05$) dan status kefungsian ($\chi^2=3.198$, $p=0.074$) dengan status sarkopenia. Kesimpulannya, sarkopenia lebih tinggi dalam kalangan warga emas yang tinggal di komuniti PPR KL. Kajian masa depan disarankan untuk meluaskan saiz sampel yang lebih besar untuk menggeneralisasikan keseluruhan populasi warga emas di KL dengan menggunakan kriteria AWGS 2014.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Ageing in a biological term is when the variety of molecular and cellular damage over time which can leads to decrease in physical and mental ability, increase risk of chronic disease, and lead to death (WHO, 2018). Based on World Health Organization (WHO) (2018), ageing correlated with other life transitions such as retirement, relocation to more appropriate accommodation and the loss of friends and partners. WHO also reported that the pace of ageing population is increasing dramatically which more on developed countries then followed by developing countries. In Malaysia, person that aged 60 years and above are classified as older person where the proportion of it higher, at 9.9% or 3.3 million of the 32.4 million estimated total population and it is expected to double its elderly population within 23 years (National Health and Morbidity Survey, 2018). Moreover, it is expected that Malaysia transform to an aging population up until 11.3% of total population by the year 2020 (Badrasawi, Shahar, & Kaur Ajit Singh, 2017).

Ageing will results in changes in body composition where it can contribute to the decline in health and physical function (Du, Goates, Arensberg, Pereira, & Gaillard, 2018). Sarcopenia is one of the changes in body composition among ageing population. Sarcopenia can be defined as loss of muscle mass and strength or physical function (Batsis & Villareal, 2018). The definition of sarcopenia by European Working Group on Sarcopenia in Older People (EWGSOP) as ‘a syndrome characterized by progressive and generalized loss of skeletal muscle mass and strength which results in physical disability, poor quality of life and mortality’ (A. J. Cruz-Jentoft et al., 2014). Furthermore, definition of sarcopenia followed by International Working Group on

Sarcopenia (IWGS), the American Foundation for the National Institutes of Health and the Asian Working Group on Sarcopenia (AWGS) which have a similar efforts as EWGSOP (Frontera, 2019).

In some research using the EWGSOP definition, the prevalence of sarcopenia ranged from 0.9% to 33.6% varying from place of residence, gender, body composition, functional ability level and other co-morbidities (Villada, Franco, & De Paz Fernández, 2015). The prevalence of sarcopenia estimated between 25-45% of elderly in the United States (U.S.) and in substantial proportion across the world of elderly population even among healthy population (Du et al., 2018). Another study from UK, the prevalence of sarcopenia in community-dwelling was 4.6% and 7.9% for older men and women respectively (Patel et al., 2013).

Asian Working Group for Sarcopenia (AWGS) being organized by China, Hong Kong, Japan, South Korea, Malaysia, Taiwan and Thailand in further research development of sarcopenia in Asia (Chen et al., 2014). In Asia, the impact of sarcopenia may be stronger than other continents due to the rapid population aging and the population size (Chen et al., 2014). However, there was one study stated that individuals in non-Asian countries were more prone to be sarcopenic than Asian countries among both genders in elderly (11% vs 10% in men, 13% vs 9% in women) (Shafiee et al., 2017).

It is reported that 1 to 29% of elderly living in the community have a sarcopenia which this number increased to 14 to 33% for the long-term care older residents (Khongsri, Tongsuntud, Limampai, & Kuptniratsaikul, 2016). In Taiwan study, it is showed that the prevalence of sarcopenia was 7.1% and severe sarcopenia was 5.6% (Wu et al., 2014). In Korean elderly, the prevalence of sarcopenia was 16.0% and 23.3% was reported sarcopenic obesity (Lim et al., 2018).

In Malaysia, Norshafarina et al. (2013) stated that the prevalence of sarcopenia was 59.8% where 89.0% in men and 40.3% in women. This study also stated that 16.1% in men and 12.4% in women were severe sarcopenia (Norshafarina et al., 2013). In other study, the prevalence of sarcopenia in Malaysia was 7.7% where 7.2% in men and 8.0% in women according to AWGS (MI et al., 2015). Another study in Malaysia, they compared two methods which are Janssen et al. (2002) and EWGSOP (2010) in identified sarcopenia among elderly (Rosli, Shahar, Badrasawi, Singh, & Mohamed Sakian, 2017). Janssen et al. (2002) used skeletal muscle index (SMI) as the criterion for sarcopenia screening, while the EWGSOP (2010) used gait speed, hand grip strength and SMI as their criterion and it is claimed that 50.5% and 32.2% of participants were sarcopenia respectively (Rosli, Shahar, Badrasawi, Singh, & Mohamed Sakian, 2017). Shafiee et al. (2017) claimed that sarcopenia may results in disability, poor quality of life and increased the risk of mortality.

This ageing syndrome will cause decreasing in activities of daily living (ADLs) and dependency on other people (Du et al., 2018). There is a study reported that sarcopenia also associated with other diseases such as insulin resistance, dyslipidemia, cardiovascular and metabolic diseases (Chen et al., 2016). Hence, sarcopenia that being untreated will cause high personal, social and economic burden (Sieber, 2019).

Thus, this study will focus on factors that associated with sarcopenia using AWGS criterion among community dwelling elderly in PPR Kuala Lumpur. The range age of elderly is ranging about 60 years and above and free-living.

1.2 PROBLEM STATEMENT

Sarcopenia is a major clinical problem that is common in public health among elderly population. This is because of the ageing process that faced among elderly population. Sarcopenia may harm among elderly because it is a predictor of falls, disability, loss of independence and may also lead to death (Yu, Khaw, Jadcak, & Visvanathan, 2016). Sieber (2019) stated that this geriatric syndrome will diminished the elderly to do their activities of daily living and will have a higher hospital costs when hospitalized.

Some studies stated that sarcopenia have a lacking standardized intervention in term of their management and treatments. The prevalence of sarcopenia may different due to different use of measurement tools, cut-off points and definitions which lead to difficulties in interpret the results (Shafiee et al., 2017). In Spanish community-dwelling elderly, it is reported that 10% in men and 33% in women who are mean age between 74.6 and 75.3% respectively diagnose sarcopenia based on EWGSOP criteria (Patel et al., 2013). The Asian Working Group for Sarcopenia (AWGS) estimated that the prevalence among older population ranges between 4.1% and 11.5% (Chen et al., 2016). In Hong Kong, sarcopenia more associated with who had a poorer cognitive function and lower protein or vitamin intake among community-dwelling elderly in men; the prevalence was 9.4% (Chen et al., 2016).

In Malaysia, study by Rosli et al. (2017) and Norshafarina et al. (2013) used Janssen et al. (2002) method in determined sarcopenia among elderly and it is found that 50.5% and 59.8% were sarcopenia respectively. Another study, 58% of older Type 2 Diabetes Mellitus (T2DM) in primary care setting had pre-sarcopenia and sarcopenia using AWGS parameters (Fung et al., 2019). In Malaysia there is limited study using AWGS cut-off values in determining sarcopenia among community-dwelling elderly even though Malaysia is one of Asian country.

RESEARCH QUESTIONS

1. What is the prevalence of sarcopenia based on AWGS criterion among community dwelling elderly in Kuala Lumpur?
2. What are the factors associated with sarcopenia based on AWGS criterion among community dwelling elderly in Kuala Lumpur?

1.3 SIGNIFICANCE OF THE STUDY

No published study in Malaysia has been done in determining sarcopenia by using Asian Working Group for Sarcopenia (AWGS) criterion among community-dwelling elderly. This proposed study would give benefits on several aspects. First, this study could help in identify and provide latest and updated information (criteria) about the prevalence of sarcopenia by using Asian cut-off points among the community-dwelling elderly. Besides, this study providing variety factors of sarcopenia based on AWGS criterion that may influence elderly's health in community-dwelling. This study also will help the nutritionist and health promotion to be more aware for the sarcopenia problem in Malaysia. Moreover, will help them to plan more effective strategies and intervention to help in reducing sarcopenia problems in Malaysia. Furthermore, the findings of this study could serve as baseline data for other researchers in determining sarcopenia among elderly by using AWGS.

1.4 RESEARCH OBJECTIVES

1.4.1 GENERAL OBJECTIVES

To determine the prevalence of sarcopenia and its associated factors among community dwelling elderly in PPR flats Kuala Lumpur.

1.4.2 SPECIFIC OBJECTIVES

1. To determine the socio-demographic (age, gender, ethnicity, marital status, occupation and household incomes), body composition (BMI, middle-upper arm circumference, calf circumference and percentage of body fats), physical activity, nutritional (malnutrition and dietary intake) and functional status among the respondents.
2. To assess sarcopenia status using AWGS criterion among the respondents.
3. To determine the association between socio-demographic, body composition, physical activity, nutritional and functional status with sarcopenia status among the respondents.

1.5 RESEARCH HYPOTHESIS

There are significant association between socio-demographic, body composition, physical activity, nutritional and functional status with sarcopenia among community dwelling elderly in PPR flats Kuala Lumpur.

1.6 CONCEPTUAL FRAMEWORK

Figure 1.1 shows the conceptual framework of this study. Previous study have been shown some of the factors that associated with sarcopenia by using different method which is Jassen et al. (2002) among the community-dwelling. The impact of sarcopenia in Asia may be stronger than others due to rapid aging and size of population. Therefore, AWGS reported that low muscle mass, low muscle strength and/or low physical performance should be defined as sarcopenia (Chen et al., 2014). It is found that Malaysia's population is one of the Asian countries that rapidly aging which estimated 3.25 million by 2020 (Ml et al., 2015).

Sociodemographic factors such as age, gender and ethnic group were found related with the sarcopenia and sarcopenic obesity (Du et al., 2018). Yu et al. (2014) also confirmed that the

increased with age will increased the risk of sarcopenia. Besides, sarcopenia more common in men than women living in the community (Villada et al., 2015).

Body composition status such as calf circumference was found to correlate with sarcopenia among the older population (Sun et al., 2017). Other than that, Gabat, Faltado, Sedurante, & Tee (2018) reported that participants in sarcopenia have higher body mass index (BMI) than non-sarcopenic participants. In Malaysia study, sarcopenic subjects were had a lower skeletal muscle index (SMI) in both men and women which due to decreasing in muscle mass and muscle strength during ageing process (Norshafarina et al., 2013).

Physical activities showed a different results regarding the intensity of activities in reduced sarcopenia among elderly where the prevalence of low-activity group was 17.9% for men compared to moderate-activity and high-activity was 12.4% and 5.7% respectively in Korea (Ryu et al., 2013).

Nutritional status of this study will focus on the dietary intake and malnutrition status of the respondents. Diet and physical activity are among the most frequent risk factors of sarcopenia and widely aimed in treatment trials to reduce the incidence and/or severity of sarcopenia (Beasley, Shikany, & Thomson, 2013). Lim et al. (2018) stated that energy and protein intake were correlated with sarcopenia and sarcopenic obesity due to proteins are the building blocks for muscle metabolism. In order to maintain muscle health, dietary vitamin E is necessary to protect the muscle from oxidative damage during aging (Khor, Abdul Karim, Wan Ngah, Mohd Yusof, & Makpol, 2014). Furthermore, malnutrition also related with sarcopenia because it is associated with a reduction in protein intake among older population (Sieber, 2019).

Functional status such as instrumental activities of daily living (IADL) will be focus on this study. Sarcopenia might strongly related with functional disability (Bahat et al., 2010). In one study, their analysis found that sarcopenia could have a negative impact on the independence of ADLs in older adults (Perez-Sousa et al., 2019).



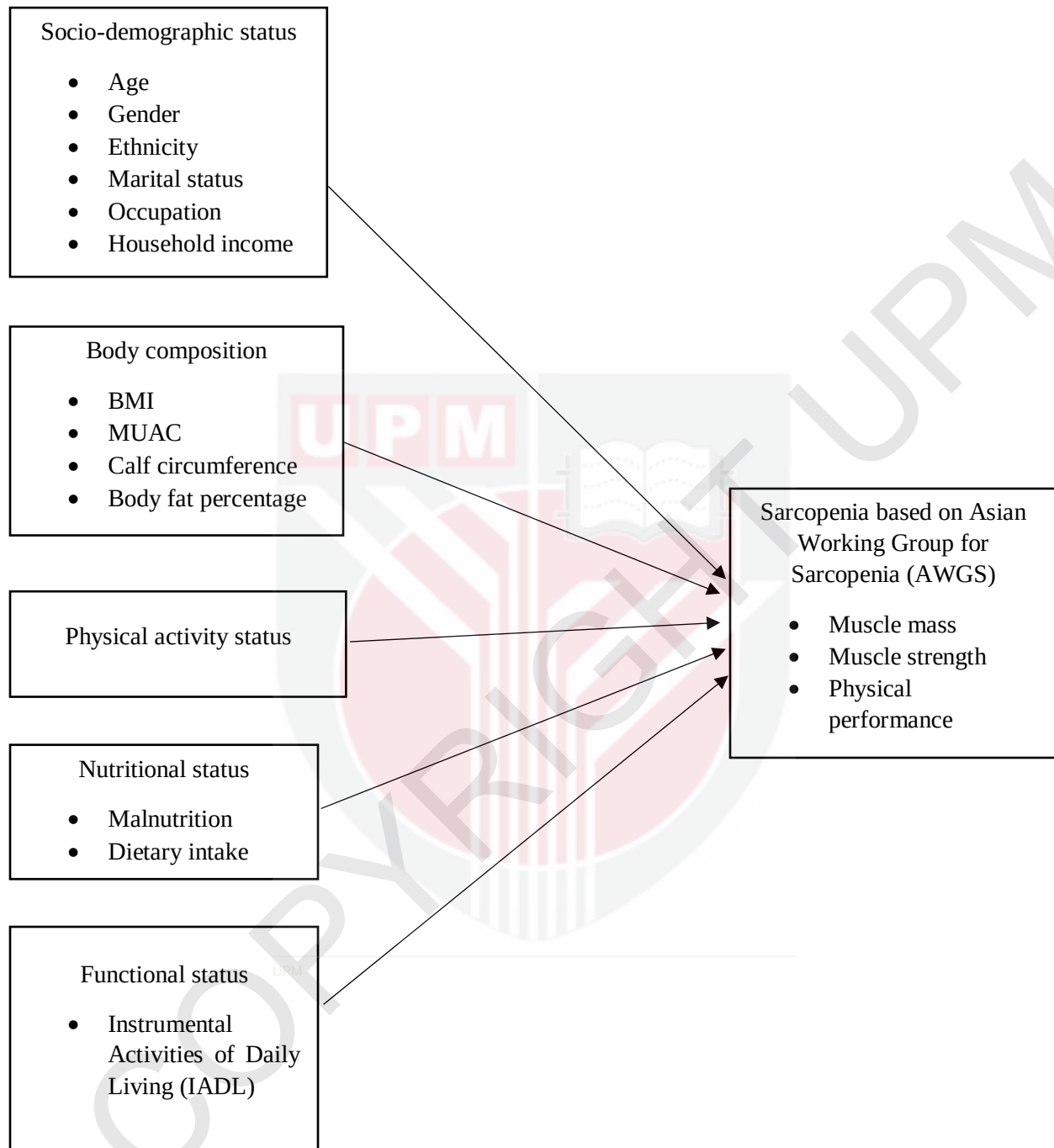


Figure 1.1: Conceptual framework of this study

CHAPTER 2

LITERATURE REVIEW

2.1 Sarcopenia and its prevalence among elderly population

Sarcopenia is a condition characterized by loss of skeletal muscle mass and function which it is primarily a disease among the elderly (Santilli, Bernetti, Mangone, & Paoloni, 2014). In 2010, European Working Group on Sarcopenia in Older People (EWGSOP) stated that sarcopenia is a syndrome that characterized by progressive and generalized loss of skeletal muscle mass, function and strength which correlated with physical disability, poor quality of life and death (Alfonso J. Cruz-Jentoft et al., 2010). Cruz-Jentoft et al. (2010) also defined that sarcopenia is based on criterion 1 plus criterion 2 or 3 which are low muscle mass, low muscle strength or low physical performance respectively.

EWGSOP was develop in defined sarcopenia in clinical practice and research studies. There were not have much difference between EWGSOP and AWGS in determined sarcopenia. The difference was AWGS added Asian perspectives which the cut-off values more suitable among elderly in Asian country (Chen et al., 2014). In EWGSOP (2010), gait speed was first in determined sarcopenia then followed by hand grip strength and muscle mass which differed from AWGS (2014). In AWGS (2014), the researcher measured gait speed and/or handgrip then followed by muscle mass in determined sarcopenia.

It is reported that about 5 to 10% of people that aged more than 65 years old are sarcopenic (Morley, Anker, & von Haehling, 2014). Mohd Nawi, Khaw, Lim, & Yu (2019) stated that adults estimated to lose about 3% to 5% of muscle mass every decade which after age 50, it is increases from 1% to 2% every year. One study reported that the decline in muscle mass from 30% to 50% between the ages of 40 and 80 years old and increasing as much as 3% in functional capacity after

the age of 60 (Patel et al., 2013). For instance, elderly who are aged between 65 and 75 years old may loss independence on daily works about 14% among sarcopenia elderly and about 45% of elderly need support from others in their daily life when reached 85 years (Wicks, Salamon, Calderon, Carcache de Blanco, & Mahady, 2018).

Based on EWGSOP, geriatric syndrome, sarcopenia, identified by staging which are presarcopenia, sarcopenia, and severe sarcopenia. The presarcopenia stage is defined by low muscle mass without impact on muscle strength or physical performance. The sarcopenia stage is identified by low muscle mass with a low muscle strength or physical performance. The last stage which are severe sarcopenia is characterized by low muscle mass, strength and physical performance are met (Santilli et al., 2014). In Japanese men and women study, the prevalence of pre-sarcopenia (class I) was 34.5% in men and 35.6% in women while for the sarcopenia (class II) was 7.3% and 7.0% in men and women respectively (Kawakami et al., 2015).

Participants with sarcopenia showed a lower body mass index (BMI), hand grip strength (HS), gait speed (GS), calf circumference (CC), prescribed more medications and had a low physical activity among study in community-dwelling elderly in Chinese (Gao et al., 2015). Furthermore, in Hong Kong study, it is reported that the prevalence of pre-sarcopenia among the geriatric patients was 20.8% in males and 12.4% in females which based on the EWGSOP criteria (Ho et al., 2016). In addition, another study that involved 4000 community-dwelling elderly aged ≥ 65 years, claimed that 9% of the participants diagnosed with sarcopenia (EWGSOP criteria) (Yu et al., 2014).

In Taiwan study which involved 549 participants, it is stated that 7.1% categorized having sarcopenia and 5.6% of them having severe sarcopenia (Wu et al., 2014). Besides, 258 participants among men and women from a northern Spanish city, 2.4% was found diagnosed with sarcopenia

based on EWGSOP definition (Villada et al., 2015). In Korea study, it is found that out of 2264 elderly, 12.1% of men and 11.9% of women were categorized as having sarcopenia (Ryu et al., 2013).

Norshafarina et al. (2013) reported that overall prevalence of sarcopenia was 59.8% where 89.0% in men and 40.3% in women among mean age of subjects 66.4 ± 5.7 years old; it also showed that 7.2% and 27.9% in men and women respectively categorized as moderate sarcopenia in Malaysia. In Kedah, it is identified that 50.5% and 32.3% in elderly categorized as sarcopenic based on skeletal muscle index (SMI) and EWGSOP methods respectively (Rosli et al., 2017).

Other than that, in recently studies, sarcopenic obesity also has been highlighted in mechanism of muscle reduction, increase of body fat and redistribution of body fat due to aging process (Lim et al., 2018). This study also claimed that inadequate nutrition, reduced physical activity and chronic illness associated with sarcopenia. One study stated that over half (55.3%) participants diagnosed with sarcopenia between 66.66 years vs 61.63 years ($p < 0.001$) and most of it likely to be male (65.6% vs 38.6%, $p < 0.001$) among the cancer patients (Nipp et al., 2018). In addition, it is claimed that elderly who diagnosed with sarcopenia had significantly higher liver cancer mortality than non-sarcopenic elderly in Japan (Chen et al., 2016).

2.2 Factors associated with sarcopenia among elderly population

2.2.1 Socio-demographic according to sarcopenia

Sarcopenia was associated with age in both genders (Tay et al., 2015). Besides, the prevalence of sarcopenia and sarcopenic obesity also associated with the increasing of age that differed by sex and race/ethnic group (Du et al., 2018). In Kashiwa city, Chiba, Japan, 14.2% in men and 22.1% of women were reported having a sarcopenia among community-

dwelling adults aged 65 years (Ishii et al., 2014). Nipp et al. (2018) claimed that there was a statistically relationship between sarcopenia, age and sex among the cancer patients. Besides, Gao et al. (2015) stated that sarcopenia more commonly occurred in women than men (12.0% vs. 6.7%, $p=0.031$). In contrast, sarcopenia more frequent in men than women, with 4.9% and 1.2% respectively among community-dwelling in a northern Spanish city (Villada et al., 2015).

The prevalence of sarcopenia increased within age which it is found that 4.25% in the 18 to 39 age group, 8.85% in the 40 to 64 age group and 15.51% in the 65 years and older age group (Du et al., 2018). It is stated that 200 subjects of elderly with mean age 67.9 ± 7.9 were reported to fulfilled with sarcopenia criteria which female predominance (68.5%) and majority of Chinese ethnicity (92%) (Tay et al., 2015). In addition, 883 participants of New Mexico Elder Study stated that the prevalence of sarcopenia based on EWGSOP increased from 13% to 24% in elderly under 79 years age to >50% in elderly over 80 years age which different in ethnicity (Patel et al., 2013). Other than that, elderly who are aged 75 years and above were 3.3 times more likely to have sarcopenia than elderly aged 60 to 74 years ($p<0.01$) in Malaysia based on EWGSOP criteria (ROSLI et al., 2017). Moreover, it is defined that men with pre-sarcopenia and sarcopenia were significantly older than non-sarcopenic subjects ($p<0.05$) in Japan (Kawakami et al., 2015).

Furthermore, prevalence of sarcopenia in rural population was higher than urban population where it is 13.1% vs. 7.0% ($p=0.012$) in Chinese community-dwelling elderly (Gao et al., 2015). This study was the first study that compared sarcopenia between rural and urban population among elderly. In Malaysia study, urban respondents in low socioeconomic status (SES) were reported had a low protein intake (adjusted OR: 0.94; 95%

CI: 1.01-10.6) among elderly (70.1 ± 6.1 years old) which may result in sarcopenia due to persistent deprivation of protein (Shahar, Vanoh, Mat Ludin, Singh, & Hamid, 2019).

Other than that, Du et al. (2018) defined that prevalence of sarcopenia differed between race/ethnicity and sex where for non-Hispanic (NH) white was 15.48% in men and 15.12% in women, for NH black was 8.58% in men and 1.57% in women, for Hispanic was 26.79% in men and 27.18% in women and for other ethnic was 16.48% in men and 23.19% in women ($p < 0.05$).

2.2.2 Body composition according to sarcopenia

Anthropometric measurements are one of the assessment that had being used widely in measuring sarcopenia due to it is safe, simple, economical and clinically useful (Sanada et al., 2018). It is stated by one study that these three variables which are age, grip strength and calf circumference were high accuracy in detecting sarcopenia in Japanese older adults (Kawakami et al., 2015). Krause, McIntosh, and Vallis (2012) reported that fat-free mass and waist circumference associated with sarcopenic in elderly population. There is one study that involved 526 respondents in Japan reported that calf circumference was positively correlated with the diagnosis of sarcopenia (Sun et al., 2017). Besides, it is found that women in Korea with sarcopenia have a higher weight, BMI and waist circumference compared with those without sarcopenia (Ryu et al., 2013).

Kawakami et al. (2015) stated that there were no differences between height or body fat percentage and sarcopenia either men or women in elderly population. However, Krause et al. (2012) claimed that free-fat mass index only correlated with maximum

handgrip strength ($r=0.636$, $p<0.05$) and waist circumference ($r=0.771$, $p<0.01$) among sarcopenic individuals.

In Philippine study, it is showed that there is significantly associated between body mass index (BMI) and lower prevalence of sarcopenia which 50%, 30%, 0% and 20% for normal, overweight, obese ($p<0.01$) and underweight respectively (Gabat et al., 2018). Besides, higher BMI associated with lower incidence of sarcopenia and reversibility of sarcopenia among Chinese elderly (Yu et al., 2014). This study also claimed that BMI was positively associate with the components of sarcopenia which are appendicular skeletal muscle (ASM) (aged-adjusted $r=0.578$, $p<0.001$) and grip strength (age-adjusted $r=0.033$, $p<0.05$).

In addition, elderly among the rural area reported had a lower calf circumference (adjusted odd ratio: 0.91; 95% CI: 0.85-0.98) which can contributed to decline in muscle mass or lean tissue that may lead to sarcopenia (Shahar et al., 2019).

2.2.3 Physical activity status according to sarcopenia

Physical activity (PA) consists of low-, moderate-, and high-intensity of activities. Based on WHO, moderate-intensity PA causes noticeable accelerates heart rate while high-intensity PA causes rapid breathing and substantial increase in heart rate. It is approximately estimated 3-6 METs for moderate-intensity and >6 METs for high-intensity PA. Some study proposed that physical inactivity can contributes in development of sarcopenia and being physical active can increase muscle mass and muscle strength among elderly population (Steff et al., 2017). Moreover, there is study stated that exercise is one of the intervention in treatment of sarcopenia which support with the most evidence (Moore

et al., 2019). Based on IWGS (2011), there is no particularly specific frequency, type and intensity of physical activities in reducing or preventing from having sarcopenia (Ribeiro & Kehayias, 2014).

The prevalence of low-activity group was 17.9% for men who had sarcopenia compared to moderate-activity and high-activity group where the prevalence was 12.4% and 5.7% respectively in Korea (Ryu et al., 2013). In Japan free-living elderly, it is reported that daily step count and daily duration of exercise (>3 METs) were lower among the sarcopenic subjects compared to non-sarcopenic; it also stated that as the aged increasing, the less physical activity will be done among the elderly (Park, Park, Shephard, & Aoyagi, 2010).

Furthermore, sarcopenic subjects in physical activity (aerobic, strength, balance and flexibility exercise) had a higher mean in Short Physical Performance Battery (SPPB) scores (8.7 ± 0.5 points) compared to sarcopenic subjects in successful aging (8.3 ± 0.5 points) at twelve months of intervention (Liu, et al., 2013). One study reported that physical activity reduced the suffering from sarcopenia in men [OR=0.46, 95% CI (0.37-0.58), $p < 0.00001$] and in women [OR=0.65, 95% CI (0.52-0.81), $p < 0.0001$] (Steffl et al., 2017). Aggio et al. (2016) stated that subjects with sarcopenia and severe sarcopenia were less participated in muscle strengthening/endurance exercises which were 10.1% and 7.6% respectively compared to non-sarcopenia subjects which was 12.9%.

Other than that, being physically inactive where increasing every 1-h in daily sitting time can increase risk of sarcopenia (33%) [Odd ratios 1.33 (95% confidence interval (CI) 1.05, 1.68)] (Gianoudis, Bailey, & Daly, 2014). It is reported than subjects with sarcopenia and severe sarcopenia more spent time being a sedentary which were 614.1 min/day and

650.6 min/day respectively compared to non-sarcopenia subjects which was 610.9 min/day ($p<0.001$) (Aggio et al., 2016).

2.2.4 Nutritional status according to sarcopenia

Nutrition is one of the important roles in elderly for health, well-being and being in successful aging (Volkert & Schrader, 2013). Sarcopenia may developed due to poor nutrition, sedentary lifestyle, insulin resistance and increasing age in both sex (Wicks et al., 2018). Dietary protein was inversely associated with loss of lean mass and one of the modifiable risk factor for sarcopenia in elderly (Houston et al., 2008). Based on Institute of Medicine (IOM), current protein recommendations are set range between 10%-35% of energy (Beasley et al., 2013). Meanwhile, based on Recommended Nutrient Intake (RNI) 2017, older population recommended to consume protein between 10-20% of total energy intake (TEI).

Besides, there is significant difference of nutrient intake in term of energy ($p=0.005$) and protein intake ($p=0.046$) between sarcopenia and sarcopenic obesity in Korean elderly (Lim et al., 2018). One study investigated that stroke patients with sarcopenia had significantly improved the performance of activities of daily living (ADLs) and muscle mass and strength after eight weeks of administration of a leucine-enriched amino acid supplement (Yoshimura et al., 2019). However, there is study claimed that increasing amount of protein intake (consumption of high-quality protein food, ricotta cheese) might not useful in elderly men and women with sarcopenia (Alemán-Mateo, Macías, Esparza-Romero, Astiazaran-García, & Blancas, 2012).

Moreover, there is one study with a small evidence claimed that a healthier diet (adequate vitamin D intake) might be give beneficial in order to reduce sarcopenia among elderly (Moore et al., 2019). In contrast, study in Chinese community-dwelling reported that protein and vitamin D intake were not significantly associated with sarcopenia (Yu et al., 2014). Other than that, there is an association between vitamin E level and sarcopenia where one study stated that consumption of vitamin E supplementation may delay or prevent muscle wasting among the elderly (Wicks et al., 2018).

In addition, female sarcopenic subjects were reported to have a significantly higher risk of malnutrition ($p=0.007$) (Tay et al., 2015). Malnutrition among elderly population usually related with the inadequate amount of proteins intake which may lead to protein-energy malnutrition (PEM) (Sieber, 2019).

2.2.5 Functional status according to sarcopenia

Frailty and functional disability play a major part in determining sarcopenia during ageing process (Estrada, Kleppinger, Judge, Walsh, & Kuchel, 2007). Strength evaluation, walking assistance, ability to rise from chair, ability to climb stairs and history of falls were assess in identified sarcopenia among elderly population (Morandi et al., 2015). Functional status were assessed using activities of daily loving (ADL) and instrumental activities of daily living (IADL) where it is found that there were no significantly different between sarcopenic and non-sarcopenic residents (8.9 ± 2.0 vs. 8.7 ± 1.9 , $p>0.05$ for ADL and 8.7 ± 4.7 vs. 8.8 ± 4.3 , $p>0.05$ for IADL respectively) (Bahat et al., 2010).

Morandi et al. (2015) reported that overall prevalence of sarcopenia was 60% which 62% from males and 60% from females. This study also stated that overall the subjects had

worse functional status and walking flexibility subitem by using the Barthel Index (BI) assessment. Maeda and Akagi (2015) defined that out of 42.3% of subjects that diagnosed with dysphagia, 1.7% of the subjects were diagnosed as sarcopenia This study also claimed that lower tongue pressure which cause dysphagia was linked between malnutrition and low ADL that can cause secondary sarcopenia (Maeda & Akagi, 2015).



CHAPTER 3

METHODOLOGY

3.1 STUDY DESIGN

This was a cross sectional study aimed to determine the associations between socio-demographic, body composition, physical activity, nutritional status (malnutrition and dietary intake) and functional with sarcopenia status among community dwelling elderly in PPR Kuala Lumpur.

3.2 STUDY LOCATION

This study was carried out in selected *Projek Perumahan Rakyat* (PPR) in Kuala Lumpur. PPR is a government program to provide decent houses for low-income earners. National Housing Department/Ministry of Housing and Local Government is the one agency who lead the PPR projects in Malaysia. PPR houses built under both PPRM and PPRS based on the specifications of low-cost housing. PPR project for rental (PPRS) was introduced since February 2002 and being focus on low income group and squatter at RM124.00 per month. PPR project for ownership (PPRM) also being developed by government for low income groups to own a house which the prices at RM35000.00 per unit in Peninsular Malaysia and RM45000.00 in Sabah and Sarawak. In Kuala Lumpur, PPR flats was built since 1998 by National Housing Department (*Jabatan Perumahan Negara* or JPN). The total population in Kuala Lumpur to be estimated around 1.78 million by Department of Statistics.

3.3 STUDY SAMPLE

The targeted respondents were community-dwelling elderly aged 60 years and above who lived at PPR flats in Kuala Lumpur and able to walk without any assistance. The criteria of the selected respondents were according to the inclusion and exclusion as stated below:

Table 3.1: Inclusion and exclusion criteria for subject of the study

INCLUSION CRITERIA	EXCLUSION CRITERIA
• Malaysian • Aged 60 and above • Men or women	• Hearing impairment • Severe cognitive impairment (e.g. Alzheimer, schizophrenia) • Physical disability (e.g. bed-ridden, cancer, stroke)

3.4 SAMPLE SIZE

The sample size for this study was estimated by calculation based on the correlation coefficient formula as shown below:

$$n = \frac{(Z_{(1-\frac{\alpha}{2})} + Z_{(1-\beta)})^2}{r^2/(1-r^2)} + 5$$

Where;

n = Calculated sample size

$Z_{(1-\frac{\alpha}{2})}$ = Z score for significance level at 5% = 1.96

$Z_{(1-\beta)}$ = Z score for power set at 80% = 0.84

r = the expected correlation coefficient

Table 3.2: Correlation coefficient calculation based on previous study to calculate the sample size.

	Variable	Correlation, r	Calculation
1	Gait speed and sarcopenia (Falsarella et al., 2014)	0.2522	$n = \frac{(1.96 + 0.84)^2}{0.0636/(1 - 0.0636)} + 5$ $\therefore n = 120$
2	Handgrip strength and sarcopenia (ASM/weight) (Estrada et al., 2007)	0.23	$n = \frac{(1.96 + 0.84)^2}{0.0529/(1 - 0.0529)} + 5$ $\therefore n = 145$
3	Upper muscle mass and sarcopenia (Fung et al., 2019)	0.320	$n = \frac{(1.96 + 0.84)^2}{0.1024/(1 - 0.1024)} + 5$ $\therefore n = 74$

*ASM = Appendicular Skeletal Muscle Mass

The highest number of sample size was selected as the sample size of this study which 145 respondents based on Table 3.2. About 10% were added up to adjust for non-response. Therefore, this study had recruited a total of 160 subjects based on criteria as explained in the following section.

3.4 SAMPLING DESIGN

The first sampling involved the selection of 5 PPR from 31 PPR flats in Kuala Lumpur (Figure 3.1). Five selected PPR flats were randomly selected using simple random sampling which were PPR Batu Muda, PPR Seri Alam Fasa 2, PPR Kg. Muhibbah, PPR Wahyu and PPR Hiliran Ampang. By applying cluster sampling method, all blocks from the randomly selected PPR were included in the study. Respondents were selected by random sampling through the list name obtained from each PPR.

Respondents were screened during health promotion program through inclusion and exclusion criteria before participating in the study. If the respondents failed to meet the criteria,

selection were made again through the same method using random sampling method. Invitation letter and consent form were disseminated to respondents who are eligible and they were explained on the benefit and risk they obtain from this study.

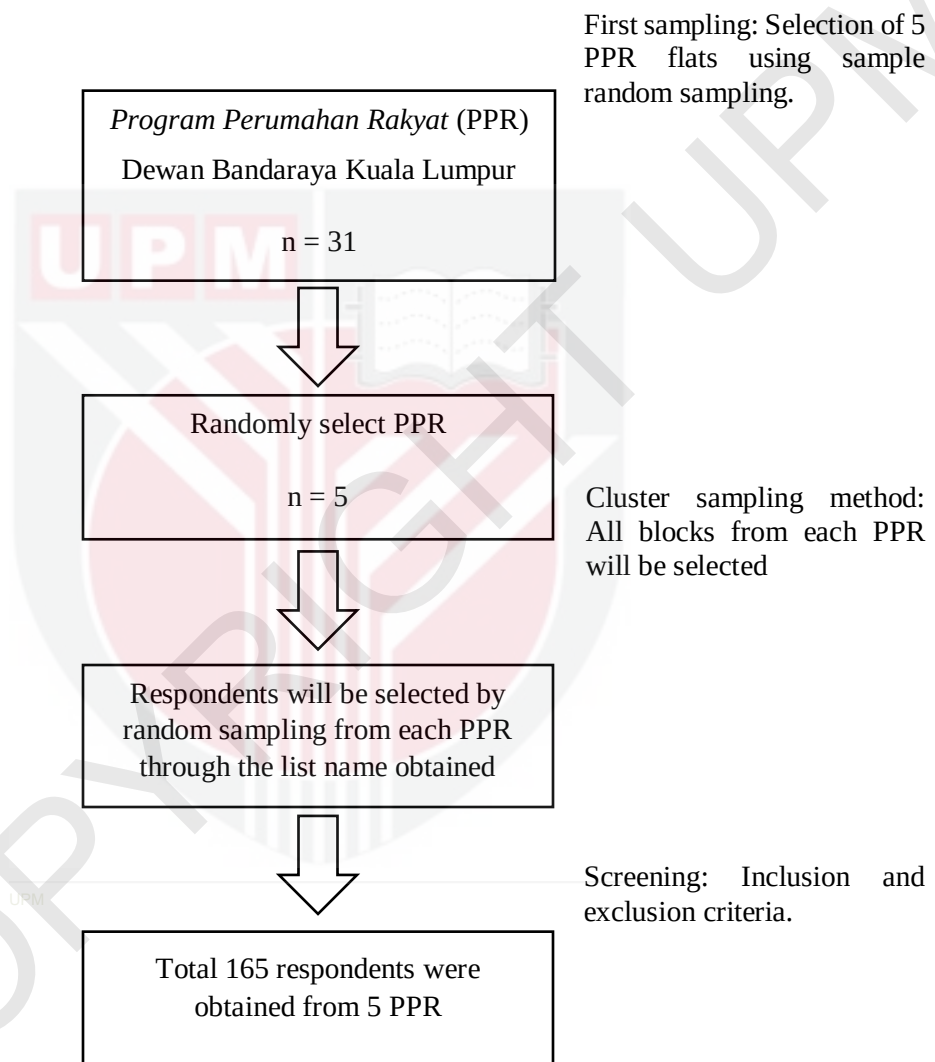


Figure 3.1 Sampling Design for PPR

3.5 STUDY INSTRUMENTS

The questionnaires were prepared in Malay. The validated questionnaires that used in the study were based on socio-demographic, body composition, physical activity, nutritional, functional and sarcopenia status (Appendix X)

3.5.1 Socio-demographic

This questionnaire contained respondent's socio-demographic characteristic which are age, gender, ethnicity, marital status, occupation and household income which were self-reported by the respondents.

3.5.2 Body composition

The height of the respondents were measured using SECA Portable Stadiometer 213 (SECA, Hamburg, Germany) to the nearest 0.1 cm. Demi-span (DS) measurement were used to estimate height (cm) for elderly who need assistance and cannot stand upright due to spinal deformities (kyphosis). DS were measured using flexible tape (Lufkin Executive Thinline Tape W606PM, Cooper Hand Tools, Raleigh, North Carolina, USA). Researcher will measure as the distance from the middle of the sternal notch to the tip of the middle finger of respondents in the coronal plane. The DS formula by Ngoh, Sakinah & Harsa (2012) were used as shown below:

$$\textbf{Men: } 67.51 + (1.29 \times \text{DS}) - (0.12 \times \text{age}) + 4.13$$

$$\textbf{Women: } 67.51 + (1.29 \times \text{DS}) - (0.12 \times \text{age})$$

Body mass index (BMI) and body fat percentage were measured using Omron bioelectrical impedance analysis (BIA) HBF-375 (Omron Healthcare, Alexandra Road, Singapore) to monitor the body composition of the respondents. Before the respondents stepping on the BIA, they were

asked to remove their shoes, socks, watch, bracelet or any heavy items on their body. After that, the researcher will set the respondents' personal data which are their date of birth, gender and height. After that, the respondents will grip electrodes and extend arm straight at 90° angle to body. The data of the respondents shown at the BIA were taken by researcher. The classification of BMI and body fat percentage are shown in the Table 3.3 and Table 3.4 respectively below.

Table 3.3: Classification of BMI (WHO, 2004)

Classification	BMI (kg/m²)
Underweight	<18.5
Normal range	18.5 to 24.9
Overweight	25.0 to 29.9
Obese class I	30.0 to 34.9
Obese class II	≥35.0

Table 3.4: Classification of body fat percentage (Lee & Nieman, 2003)

Classification	Men (%)	Women (%)
Unhealthy range (too low)	<5.0	<8.0
Acceptable range (lower end)	6.0 – 15.0	9.0 – 23.0
Acceptable range (upper end)	16.0 – 24.0	24.0 – 31.0
Unhealthy range (too high)	≥ 25.0	≥ 32.0

Mid-upper arm circumference (MUAC) and calf circumference (CC) were measured by using Lufkin Executive Thinline Tape W606PM (Cooper Hand Tools, Raleigh, North Carolina, USA) to the nearest 0.1 cm which is indicator to lean body mass among the respondents. In addition, both circumference measurement were used as an indicator for muscle wasting. MUAC measurements were taken by measuring the midpoint of the upper arm, between the acromion and olecranon. For CC measurement, the measuring tape should be looped horizontally around the calf and will move until the biggest calf circumference is found. Table 3.5 below shows the cut-off

point for the mid-upper arm circumference (Sakinah et al., 2010). Table 3.6 shows the calf circumference

Table 3.5: Mid-upper arm circumference (Sakinah et al., 2010)

Classification	Men (cm)	Women (cm)
Muscle wasting/malnourished	<23.0	<22.0
Normal	≥23.0	≥22.0

Table 3. 6: Calf circumference (Sakinah et al. 2004)

Classification	Men (cm)	Women (cm)
Muscle wasting	< 30	< 27.5
Normal	≥ 30	≥ 27.5

3.5.3 Physical Activity Status

Physical activity of the respondents were measured by Physical Activity Scale for the Elderly-Malay version (PASE-M) (Ismail et al., 2015). This questionnaire was translated from the original PASE which are reliable and valid instrument for assessing physical activity levels among elderly (Singh, Rahman, Rajaratnam, Yi, & Shahar, 2018). This questionnaire consists 10 questions which are 6 questions on “leisure time activity”, 3 questions on “household activities” and 1 question on “work-related activity” during the previous 7-days period. The leisure time activity related to walk outside the home; light, moderate, strenuous sport and activities aimed at muscle strength/endurance. The total PASE score will represents total physical activity among the respondents. Researcher will weighs and summed over all the activities by multiplying the amount of time spent in each activity of the items. The lowest tertile of the PASE score will considered as low physical activity among the elderly.

3.5.4 Nutritional status

3.5.4.1 Malnutrition status

Nutritional status of respondents were assessed their malnutrition status and dietary intake. Malnutrition status of the respondents were assessed by using Mini Nutritional Assessment-Short Form (MNA-SF) (Nestle Nutrition Institute, 2009). MNA-SF consists of six items that need to be screening. Item F which is about BMI of the respondents will be replaced with the calf circumference if the BMI is not available. Table 3.7 shows the scoring of MNA-SF to help in identify elderly who are malnourished or at risk of malnutrition.

Table 3.7: Scoring for Mini Nutritional Assessment-Short Form (MNA-SF)

	Scoring (points)
Normal	12 – 14
At risk of malnutrition	8 – 11
Malnourished	0 - 7

3.5.4.2 Dietary intake

Besides, dietary intake of the respondents were taken by using diet history questionnaire (DHQ). DHQ is one of the tools to obtain information on food intake and usual dietary intake. The respondents were recalled all foods and beverages that usually consumed every day. Respondents also were asked when, where and with whom each meal was eaten. The researcher asked detailed regarding the type, portion size and the description of the cooking method. The researcher provide tools from household measurements such as standard measuring cups, glass, bowls, and spoons in order to help the respondents to recall the size and quantities of foods and beverages they consumed.

The Malaysian Food Composition Table (Tee et al., 1997) were used as reference to analyze the nutrient intake. Total energy and nutrient intake such as carbohydrate, protein and fat

of the respondents will be analyzed by using NutritionistPro software (First Data Bank Inc., 2011). The recommended range for energy, macronutrients and micronutrients intake among elderly were referred to the Recommended Nutrient Intake (RNI) for Malaysia (NCCFN, 2017).

3.5.5 Functional status

Functional status of the respondents were measured by using Instrumental Activities Daily of Living (IADL) (Lawton & Btody, 1969). IADL questionnaire assessed the ability of respondents to perform eight daily activities which are more on complex skills like ability to use telephone, shopping, prepare meals, perform housekeeping chores, laundry, use public transport, taking medication and handling finances. Table 3.8 shows the score for the IADL to indicate it is normal or have functional disability among the elderly.

Table 3. 8: Scoring for IADL (Lawton & Btody, 1969)

	Scoring
Low Function, dependent	0 -7
High function, independent	8

3.5.6 Sarcopenia

Sarcopenia of the respondents were assessed by measured their muscle strength, muscle mass and physical performance of the respondents based on the algorithm of Asian Working Group for Sarcopenia (AWGS) 2014 (Figure 3.2). Muscle strength, physical performance and muscle mass were measured by assessed their hand grip test, gait speed test and skeletal muscle mass respectively. Hand grip strength of respondents were measured using a hydraulic hand grip dynamometer (JAMAR, J. A. Preston Corporation, Jackson, MI, USA). Respondents need to sit up straight and their hand need at 90° flexion at the elbow when holding the hydraulic hand grip

dynamometer. They also need to hold the hand grip as strong as possible for both left and right hands for three times. The scoring of the hand grip strength was based on the cut-off value from the AWGS which are <26kg for men and <18kg for women indicates risk of sarcopenia. Next, gait speed was measured by walking 4m from standing start at their usual walking speed which to measure the physical performance among the respondents. The gait speed test is one of the assessment in the evaluation of severity of sarcopenia and also frailty. The scoring was based on the gait speed longer than 5 seconds to walk 4 meters (<0.8 m/s) indicates that an increased risk of frailty and sarcopenia among the respondents. Omron Bioelectrical Impedance Analysis (BIA) HBF-375 (Omron Healthcare, Alexandra Road, Singapore) was used in measuring the skeletal muscle ratio (%). The skeletal muscle mass (kg) and will be calculated as shown below:

$$\text{Skeletal muscle mass (kg)} = \frac{\text{Skeletal muscle ratio (\%)}}{100} \times \text{Body weight (kg)}$$

After calculate the skeletal muscle mass, the muscle mass (kg/m²) will be obtained. Table 3.9 below showed the classification of muscle mass based on AWGS (2014). All of these measurements were based on the AWGS (2014) cut-off values which represents the Asian cut-off points.

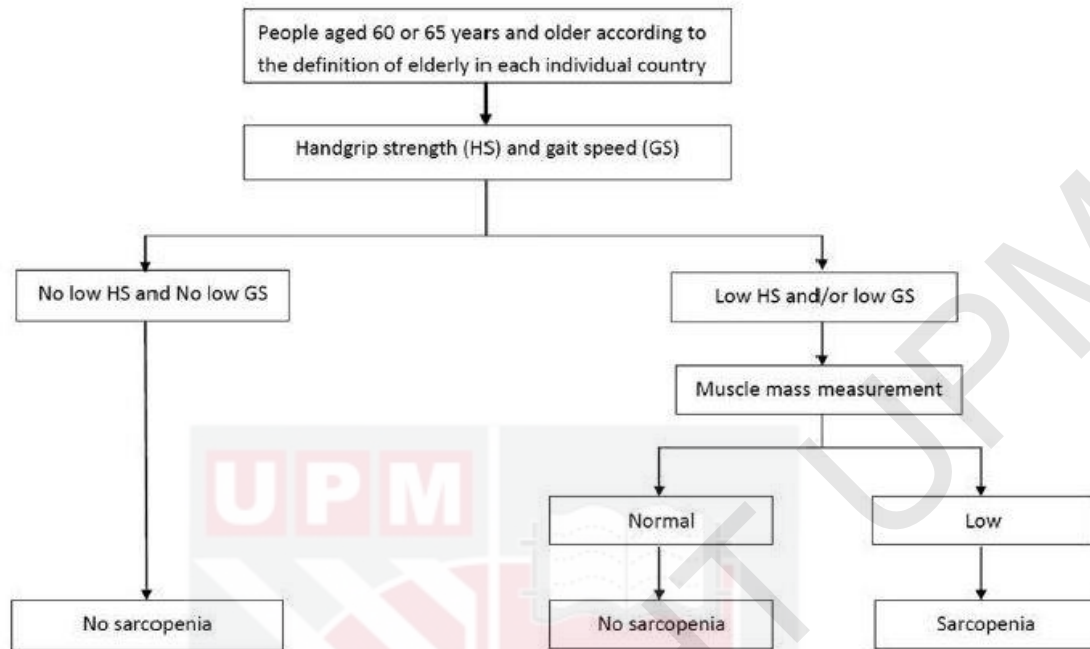


Figure 3.2: Diagnostic algorithm of Asian Working Group for Sarcopenia (AWGS) 2014

Table 3.9: Classification of muscle mass (kg/m^2) based on AWGS (2014)

Classification	Men (kg/m^2)	Women (kg/m^2)
Low	<7.0	<5.7
Normal	≥ 7.0	≥ 5.7

3.6 STUDY APPROVAL

Ethical approval was approved from the Ethics Committee for Research Involving Human Subjects Universiti Putra Malaysia (JKEUPM) prior to data collection (Appendix III). The approval for this study was obtained from the chairman of *Projek Perumahan Rakyat* (PPR) Kuala Lumpur and *Dewan Bandaraya Kuala Lumpur* (DBKL) (Appendix I). The consent form was obtained from respondents that agreed to participate in the study when the approval was approved (Appendix XI).

3.7 PRE-TEST

A pre-test were conducted among 5 respondents to test the instruments used in this study. The respondents for pre-testing will have similar inclusion and exclusion in the study sample. The purpose of this pre-testing was to evaluate the validity and understanding of respondents on the questions that being asked in the questionnaire. Besides, any problems encountered by the respondents in answering the pre-testing questionnaire will be identified and slightly modified and adjusted to the fit understanding of the respondents.

3.8 DATA COLLECTION

Data collection was conducted from February 2020 to 18 March 2020. Before conduct the data collection, meeting was held on February 2020 with the committee club association in each PPR in Kuala Lumpur. Data was able to collect before Restriction Movement of Order (RMO) which imposed by Malaysian government due to pandemic COVID-19. Data collection was held in open areas in the PPR flats. Information sheet which explains the purpose of this study was given to the respondents. Consent form was distributed to respondents who agreed to participate in the study prior to the administration of the questionnaire. It was a free-flowed program where respondents need to go to empty station in order completing the questionnaires given. All of the questionnaires including self-administered questionnaire were interviewed face-to-face by trained interviewer. Respondents need to complete all of the questionnaire which consists of socio-demographic questions, physical activity (PASE), malnutrition (MNA), dietary intake (DHQ) and functional status (IADL). Respondents also need to measure their height, weight, mid-upper arm circumference, calf circumference, body fat percentage, skeletal muscle, gait speed and hand grip strength which will measured by the researcher. Figure 3.3 below showed the flow chart of data collection for this study.

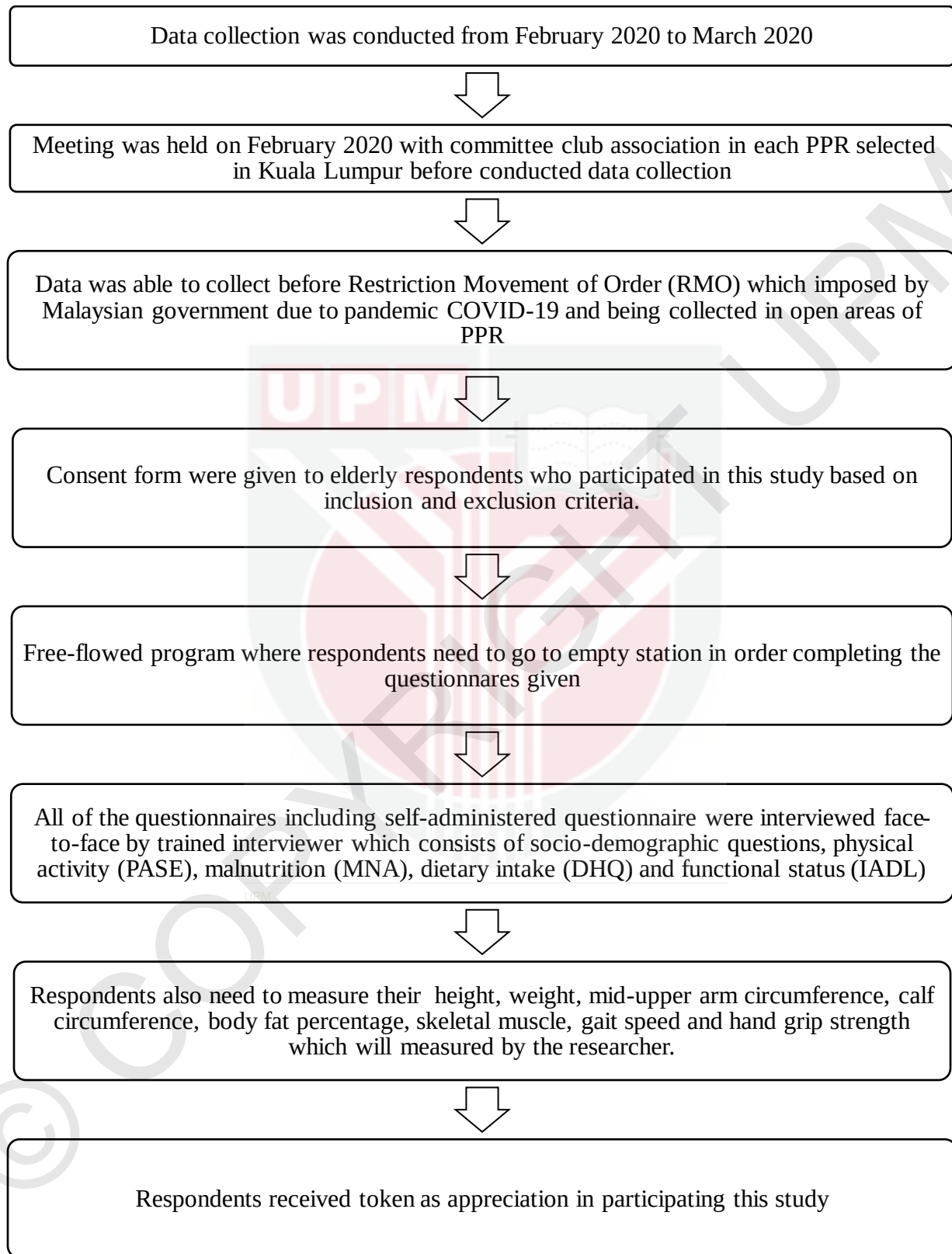


Figure 3.3 Flow chart of data collection

3.9 STATISTICAL ANALYSIS

Statistical analysis was performed by using IBM SPSS Statistics 25 (IBM Corp., Armonk, NY). All variables in the study will be expressed in descriptive statistic in which categorical variables were presented in the form of frequencies and percentages, whereas the continuous variables were presented in the form of means and standard deviation for normally distribution. The normality test was performed for continuous data in which skewness (± 2) and Kolmogorov-Smirnov were observe to test the normality data.

Categorical variables in this study were age, gender, ethnicity, marital status, occupational status, household income, body mass index, body fat percentages, mid-upper arm circumference, calf circumference, physical activity level, malnutrition status, energy intake, macronutrients (protein and total fat) intake, micronutrients (vitamin A, D, E, K, sodium, calcium, iron and zinc) intake, functional status and sarcopenia (hand grip strength, gait speed and muscle mass) status. Continuous variables in this study were age, household income, years of widow, BMI, BF%, MUAC, CC, physical activity, malnutrition, dietary intake, functional status, handgrip strength, gait speed and muscle mass. Chi-square test of independence was used to determine association between independent and dependent variables where level of significance will be set at $p < 0.05$.

CHAPTER 4

RESULTS

4.1 Socio-demographic

Socio-demographic status of the respondents in this study are shown in Table 4.1. Out of 160 elderly that were required for this study, only 82 elderly in PPR flats Kuala Lumpur (29.3% men and 70.7% women) completed the study. The final response rate for this study was 51.3%. The mean age of the respondents were 67.84 ± 5.18 , ranging from 60 years old and above in which most of the respondents were 60 to 74 years old (86.6%). Majority of them were Malay (63.4%) followed by Indian (25.6%) and Chinese (11.0%). More than half of the respondents were divorced/widow/widower (53.7%) which the mean year of being widow/widower was 7.17 ± 11.13 years, followed by married (43.9%), divorced (3.7%) and single elderly (2.4%). More than half of the respondents were already retired (53.7%). The mean for household income among the elderly respondents was $\text{RM } 1169.63 \pm 1838.84$ in which most of them were from B40 ($\leq \text{RM}4850$) group (97.6%) and only 2.4% from M40 and T20 group. It showed that B40 group which income $\leq \text{RM}4850$ was divided into 4 groups based on their household incomes. The groups were B1, B2, B3 and B4 where the household incomes were stated in Table 4.2. Based on Table 4.2, almost all of the respondents were from B1 group ($\leq \text{RM}2500$) (96.3%) among the B40 group income.

4.2 Body composition

4.2.1. Body weight status

Anthropometric measurement of the respondents are showed in Table 4.3. The mean BMI of the respondents was $26.80 \pm 4.97 \text{ kg/m}^2$. It is reported that about 41.5% of the community-dwelling elderly in PPR flats KL were overweight, while 32.9% were normal, 23.2% were obesity and only 2.4% were underweight. The results showed that none of the men among elderly had an

underweight BMI. Higher prevalence of BMI for overweight and obesity were reported among women elderly in which 41.4% and 31.0% respectively compared to men among elderly.

4.2.2. Body fat percentage

Body fat percentage of the respondents are also showed in Table 4.3. The mean body fat percentage was $38.83 \pm 24.70\%$ (men: $37.90 \pm 45.82\%$ and women: $39.21 \pm 4.36\%$). Table below showed none of them had an unhealthy (too low) and acceptable (lower end) percentage for both men and women. It is reported that only few (9.8%) of the respondents had an acceptable (upper end) percentage of body fat. However, almost all respondents had an unhealthy (too high) percentage of fat in the body which overall was 90.2% in which 91.4% in women and 87.5% in men elderly.

4.2.3. Mid-upper arm circumference (MUAC) and calf circumference (CC)

Mid-upper arm circumference (MUAC) of the respondents are shown in Table 4.3. The mean MUAC was $30.32 \pm 4.86\text{cm}$ (men: $29.58 \pm 3.18\text{cm}$ and women: $30.63 \pm 5.40\text{cm}$) among the community-dwelling elderly respondents. Results showed that almost all of the respondents show a positive results which 97.6% of them had a normal MUAC in which 98.3% in women and 95.8% in men elderly.

As shown in Table 4.3, the mean calf circumference (CC) was $35.50 \pm 3.90\text{ cm}$ (men: $35.85 \pm 3.26\text{cm}$ and women: $35.36 \pm 4.15\text{cm}$) among the elderly respondents. The results also showed a positive results same as MUAC which 98.8% of the respondents had a normal CC. It shows that none of men elderly had muscle wasting and only a few of women elderly (1.7%) in PPR flats KL had a muscle wasting.

Table 4.1: Socio-demographic status in this study (n=82)

Characteristics	Mean $\pm$ SD	n (%)
Age (years)	67.84 $\pm$ 5.18	
60-74 years		71 (86.6)
75 years and above		11 (13.4)
Gender		
Men		24 (29.3)
Women		58 (70.7)
Ethnicity		
Malay		52 (63.4)
Chinese		9 (11.0)
Indian		21 (25.6)
Marital Status		
Single		2 (2.4)
Married		36 (43.9)
Divorced/ Widow/ Widower		44 (53.7)
Years of being widow	7.17 $\pm$ 11.13	
Occupational Status		
Not working / Housewife		28 (34.1)
Retired		44 (53.7)
Retired but still working		1 (1.2)
Working		9 (11.0)
Household Income	1169.63 $\pm$ 1838.84	
B40 ($\leq$RM4850)		80 (97.6)
M40 (RM4851-10970)		1 (1.2)
T20 ($\geq$RM10971)		1 (1.2)

Table 4.2: Household income for B40 group ($\leq$ RM4850) (n=80)

Household Income	n (%)
B1 ($\leq$RM2500)	77 (96.3)
B2 (RM2501-3170)	1 (1.3)
B3 (RM3171-3970)	1 (1.3)
B4 (RM3971-4850)	1 (1.3)

Table 4.3: Body composition status in this study (n=82)

Variable	Mean $\pm$ SD/n (%)		
	Men (n=24)	Women (n=58)	Total (n=82)
Body Mass index (kg/m²)	24.76 $\pm$ 3.48	27.64 $\pm$ 5.26	26.80 $\pm$ 4.97
Underweight	0	2 (3.4)	2 (2.4)
Normal	13 (54.2)	14 (24.1)	27 (32.9)
Overweight	10 (41.7)	24 (41.4)	34 (41.5)
Obesity	1 (4.2)	18 (31.0)	19 (23.2)
Body fat percentage (%)	37.90 $\pm$ 45.82	39.21 $\pm$ 4.36	38.83 $\pm$ 24.70
Unhealthy (too low)	0	0	0
Acceptable (lower end)	0	0	0
Acceptable (upper end)	3 (12.5)	5 (8.6)	8 (9.8)
Unhealthy (too high)	21 (87.5)	53 (91.4)	74 (90.2)
Mid-upper arm circumference (cm)	29.58 $\pm$ 3.18	30.63 $\pm$ 5.40	30.32 $\pm$ 4.86
Muscle wasting	1 (4.2)	1 (1.7)	2 (2.4)
Normal	23 (95.8)	57 (98.3)	80 (97.6)
Calf circumference (cm)	35.85 $\pm$ 3.26	35.36 $\pm$ 4.15	35.50 $\pm$ 3.90
Muscle wasting	0	1 (1.7)	1 (1.2)
Normal	24 (100.0)	57 (98.3)	81 (98.8)

BMI classification: Underweight <18.5 kg/m², Normal 18.5-24.9 kg/m², Overweight 25.0-29.9 kg/m², Obesity $\geq$ 30.0 kg/m² (WHO, 2004)

Body fat percentage classification for men: too low ($\leq$ 5.0%), lower end (6.0-15.0%), upper end (16.0-24.0%), too high ($\geq$ 25.0%) (Lee & Nieman, 2003)

Body fat percentage classification for women: too low ($\leq$ 8.0%), lower end (9.0-23.0%), upper end (24.0-31.0%), too high ($\geq$ 32.0%) (Lee & Nieman, 2003)

Mid-upper arm circumference classification for men: muscle wasting (<23.0 cm), normal ($\geq$ 23.0 cm) (Sakinah et al., 2010)

Mid-upper arm circumference classification for women: muscle wasting (<22.0 cm), normal ($\geq$ 22.0 cm) (Sakinah et al., 2010)

Calf circumference classification for men: muscle wasting (<30.0 cm), normal ($\geq$ 30.0 cm) (Sakinah et al., 2014)

Calf circumference classification for women: muscle wasting (<27.5 cm), normal ($\geq$ 27.5 cm) (Sakinah et al., 2014)

4.3 Physical activity

As shown in Table 4.4, the mean physical activity using Physical Activity Scale for the Elderly (PASE) was 104.82 ± 46.87 . One in five of the elderly respondents (19.5%) in this study were classified had a low physical activity in their lifestyle. It is reported almost all the respondents (80.5%) had an acceptable physical activity which higher prevalence among women elderly (81.0%) compared to men elderly (79.2%).

Table 4.4: Physical activity status in this study (n=82)

Variable	Mean $\pm$ SD/n (%)		
	Men (n=24)	Women (n=58)	Total (n=82)
Physical Activity Scale for the Elderly (PASE)	110.47 ± 53.89	102.48 ± 43.94	104.82 ± 46.87
Low physical activity	5 (20.8)	11 (19.0)	16 (19.5)
Acceptable physical activity	19 (79.2)	47 (81.0)	66 (80.5)

4.4 Nutritional status

4.4.1. Malnutrition status

Malnutrition status of the community-dwelling elderly respondents in PPR flats KL are shown in Table 4.5. The mean malnutrition status was 12.26 ± 1.73 . Majority of the respondents (75.6%) had a normal malnutrition status where 79.2% in men and 74.1% in women. Only 24.4% of the elderly respondents had at risk of malnutrition and none of them were reported to have a malnourished.

Table 4.5: Malnutrition status in this study (n=82)

Variable	Mean $\pm$ SD/n (%)		
	Men (n=24)	Women (n=58)	Total (n=82)
Malnutrition Status (MNA)	12.42 ± 1.69	12.19 ± 1.75	12.26 ± 1.73
Normal	19 (79.2)	43 (74.1)	62 (75.6)
At risk of malnutrition	5 (20.8)	15 (25.9)	20 (24.4)
Malnourished	0	0	0

Mini Nutritional Assessment-Short Form (MNA-SF): Normal (12-14 points), At risk of malnutrition (8-11 points), Malnourished (0-7 points) (Nestle Nutrition Institute, 2009)

4.4.2. Dietary intakes

Table 4.6 shows the distribution of under-reporting among 82 respondents in the present study. Goldberg cut-off for energy intake: basal metabolic rate (EI: BMR) equation (Black, 2000) was opted in obtaining the cut-off based on this study. The respondents with either individual EI: $BMR < 1.09$ or $EI: BMR > 2.35$ were considered to be under-reported and over-reported respectively. The prevalence of under-reporting in this study was 45.1%, acceptable reporting 50.0% and over-reporting 4.9%.

Table 4.6: Under-reporting and over-reporting of energy intake among respondents (n=82)

EI:BMR	n (%)
Under-reporting	37 (45.1)
Acceptable reporting	41 (50.0)
Over-reporting	4 (4.9)

Table 4.7 shows the distribution of the respondents by dietary intakes according to the gender. The mean energy intake of the respondents was 1544 ± 683 kcal, with higher intake among men elderly (1652 ± 673 kcal) as compared to women (1544 ± 673 kcal). Five in seven of the elderly respondents (70.7%) in this study did not meet the RNI for energy intakes in which 79.2% for men and 67.2% for women.

Besides, the mean macronutrient intake of respondents were 54.09 ± 22.16 g, 224.76 ± 107.49 g and 44.19 ± 21.59 g for protein, carbohydrates and fat respectively. The results in this study showed that men elderly consumed higher protein (56.48 ± 21.91 g) and carbohydrate (261.90 ± 119.94 g) compared to women elderly (protein: 53.11 ± 22.38 g, carbohydrate: 209.39 ± 98.97 g). However, consumption of total fat was higher in women elderly (45.16 ± 23.10 g) compared to men (41.85 ± 17.62 g).

Table 4.7: Distribution of respondent by dietary intakes (n=82)

Nutrients	Mean $\pm$ SD / n (%)		
	Men (n=24)	Women (n=58)	Total (n=82)
Energy (kcal)	1652 $\pm$ 673	1544 $\pm$ 673	1544 $\pm$ 683
<RNI	19 (79.2)	39 (67.2)	58 (70.7)
$\geq$ RNI	5 (20.8)	19 (32.8)	24 (29.3)
Protein (g)	56.48 $\pm$ 21.91	53.11 $\pm$ 22.38	54.09 $\pm$ 22.16
<RNI	11 (45.8)	24 (41.4)	35 (42.7)
$\geq$ RNI	13 (54.2)	34 (58.6)	47 (57.3)
Carbohydrate (g)	261.90 $\pm$ 119.94	209.39 $\pm$ 98.97	224.76 $\pm$ 107.49
Total fat (g)	41.85 $\pm$ 17.62	45.16 $\pm$ 23.10	44.19 $\pm$ 21.59
<RNI	19 (79.2)	37 (63.8)	56 (68.3)
$\geq$ RNI	5 (20.8)	21 (36.2)	26 (31.7)
Dietary Fiber, total (g)	4.19 $\pm$ 2.04	4.92 $\pm$ 4.68	4.71 $\pm$ 4.09
Sugar, total (g)	25.02 $\pm$ 17.57	28.34 $\pm$ 27.06	27.37 $\pm$ 24.60
Vitamin A (RE)	817.33 $\pm$ 466.76	704.69 $\pm$ 394.53	737.66 $\pm$ 417.20
<RNI	8 (33.3)	28 (48.3)	36 (43.9)
$\geq$ RNI	16 (66.7)	30 (51.7)	46 (56.1)
Vitamin D (μg)	0.07 $\pm$ 0.18	0.82 $\pm$ 1.63	0.60 $\pm$ 1.41
<RNI	24 (100.0)	58 (100.0)	82 (100.0)
$\geq$ RNI	0	0	0
Vitamin E (mg)	4.09 $\pm$ 2.55	3.83 $\pm$ 1.64	3.91 $\pm$ 1.94
<RNI	23 (95.8)	56 (96.6)	79 (96.3)
$\geq$ RNI	1 (4.2)	2 (3.4)	3 (3.7)
Vitamin K	58.82 $\pm$ 131.14	26.52 $\pm$ 70.74	35.97 $\pm$ 92.86
<RNI	20 (83.3)	52 (89.7)	72 (87.8)
$\geq$ RNI	4 (16.7)	6 (10.3)	10 (12.2)
Sodium (mg)	1587.83 $\pm$ 968.48	1073.41 $\pm$ 542.83	1223.97 $\pm$ 727.42
<RNI	14 (58.3)	47 (81.0)	61 (74.4)
$\geq$ RNI	10 (41.7)	11 (19.0)	21 (25.6)
Calcium (mg)	321.08 $\pm$ 132.30	384.96 $\pm$ 197.65	366.26 $\pm$ 182.52
<RNI	24 (100.0)	58 (100.0)	82 (100.0)
$\geq$ RNI	0	0	0

Iron (mg)	11.63 ± 5.38	10.90 ± 5.13	11.12 ± 5.18
<RNI 10%	18 (75.0)	32 (55.2)	50 (61.0)
≥RNI 10 %	6 (25.0)	26 (44.8)	32 (39.0)
<RNI 15%	8 (33.3)	18 (31.0)	26 (31.7)
≥RNI 15%	16 (66.7)	40 (69.0)	56 (68.3)
Zinc (mg)	2.91 ± 1.61	2.53 ± 1.36	2.64 ± 1.44
<RNI	23 (95.8)	54 (93.1)	77 (93.9)
≥RNI	1 (4.2)	4 (6.9)	5 (6.1)

Recommended Nutrient Intakes (RNI) for Malaysia 2017

Furthermore, this study showed that more than half of the respondents (57.3%) met the RNI for protein (men: 45.8% and women: 41.4%). Higher prevalence among women (58.6%) reported did not meet the RNI compared to men (54.2%) respondents. Even though the consumption of fat was higher in both gender, they did not meet the RNI where 79.2% in men and 63.8% in women.

Most of the elderly respondents did not meet the RNI for micronutrients intake such as Vitamin E (96.3%), Vitamin K (87.8%), sodium (74.4%), 10% of iron (61.0%) and zinc (93.9%). Moreover, all of the respondents did not meet the RNI for Vitamin D and calcium. More than half respondents only met RNI for Vitamin A (56.1%) and 15% of iron (68.3%).

4.5 Functional status

Functional status of the elderly respondents in this study are shown in Table 4.8. The mean functional status was 7.10 ± 1.26 . Almost half of the respondents (48.8%) reported had a low function functional status (dependent) in their daily life. This results showed that higher prevalence in dependent among men (50.0%) compared to women (48.3%). Furthermore, more than half of elderly respondents (51.2%) had a high function functional status (independent) in their daily life.

Table 4.8: Functional status in this study (n=82)

Variable	Mean $\pm$ SD/n (%)		
	Men (n=24)	Women (n=58)	Total (n=82)
Instrumental Activities Daily of Living (IADL)	6.96 $\pm$ 1.52	7.16 $\pm$ 1.15	7.10 $\pm$ 1.26
Low function, dependent	12 (50.0)	28 (48.3)	40 (48.8)
High function, independent	12 (50.0)	30 (51.7)	42 (51.2)

Instrumental Activities Daily of Living (IADL): Low function, dependent (0-7 points), High function, independent (8 points) (Lawton & Btody, 1969)

4.6 Sarcopenia

Based on Figure 4.1, there are three characteristics in determining sarcopenia among the respondents. As shown in Table 4.9, the first characteristics was the hand grip strength of the respondents. The mean hand grip strength was 20.17 ± 19.46 kg, where men in elderly had a greater strength (32.93 ± 31.88 kg) compared to women (14.88 ± 5.59 kg). The results showed that more than half of the respondents (64.6%) had a low hand grip strength, in which higher prevalence in women (72.4%) compared to men elderly. About three in ten of the respondents (35.4%) had a normal hand grip strength.

Second characteristics was the gait speed test of the elderly respondents. The mean gait speed test was 0.82 ± 0.22 m/s. About 45.1% of the respondents reported had a normal gait speed test. In this study, women had a greater percentage (53.4%) compared to men (25.0%) in term of normal gait speed.

For the third characteristics was the muscle mass of the respondents. The mean muscle mass was $5.98 \pm 1.07 \text{ kg/m}^2$ among the respondents. Higher muscle mass was reported among men elderly ($6.63 \pm 1.14 \text{ kg/m}^2$) compared to women ($5.70 \pm 0.91 \text{ kg/m}^2$). However, five in ten of the respondents (56.1%) in this study had a low muscle mass where men (66.7%) higher in low muscle mass compared to women (51.7%) elderly.

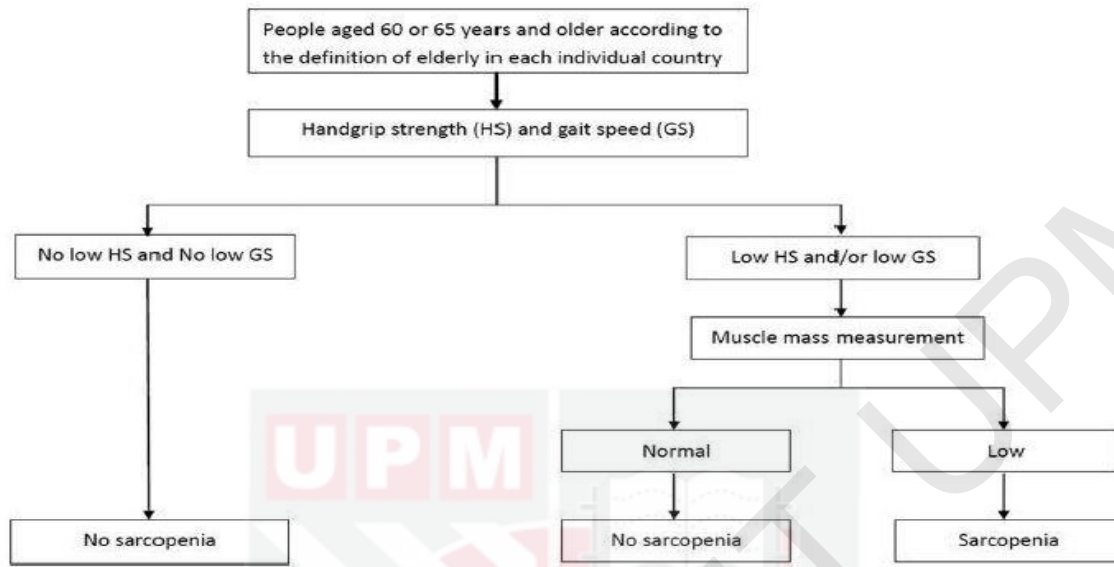


Figure 4.1 Diagnostic algorithm of Asian Working Group for Sarcopenia (AWGS) 2014

Table 4.9: Distribution of respondents by frequency of sarcopenia status using AWGS (n=82)

Variable	Mean $\pm$ SD/n (%)		
	Men (n=24)	Women (n=58)	Total (n=82)
Hand grip strength (kg)	32.93 $\pm$ 31.88	14.88 $\pm$ 5.59	20.17 $\pm$ 19.46
Low	11 (45.8)	42 (72.4)	53 (64.6)
Normal	13 (54.2)	16 (27.6)	29 (35.4)
Gait speed test (m/s)	0.92 $\pm$ 0.25	0.78 $\pm$ 0.20	0.82 $\pm$ 0.22
Slow	18 (75.0)	27 (46.6)	45 (54.9)
Normal	6 (25.0)	31 (53.4)	37 (45.1)
Muscle mass (kg/m²)	6.63 $\pm$ 1.14	5.70 $\pm$ 0.91	5.98 $\pm$ 1.07
Low	16 (66.7)	30 (51.7)	46 (56.1)
Normal	8 (33.3)	28 (48.3)	36 (43.9)
Sarcopenia status			
Sarcopenia	15 (62.5)	29 (50.0)	44 (53.7)
Non-sarcopenia	9 (37.5)	29 (50.0)	38 (46.3)

Asian Working Group for Sarcopenia (AWGS) 2014

Hand grip strength for men (<26kg), hand grip strength for women (<18kg)

Gait speed test (<0.8m/s)

Muscle mass for men: Low ($\leq 7.00 \text{ kg/m}^2$), Normal ($\geq 7.1 \text{ kg/m}^2$)

Muscle mass for women: Low ($\leq 5.7 \text{ kg/m}^2$), Normal ($\geq 5.8 \text{ kg/m}^2$)

According to algorithm of AWGS (Figure 4.1), more than half of the respondents in this study (53.7%) classified had a sarcopenia, in which 62.5% for men elderly and 50.0% for women elderly. Three in seven of the respondents (46.3%) classified as non-sarcopenia in this study. In this study, higher prevalence of non-sarcopenia reported among women (50.0%) compared to men (37.5%) in elderly.

4.6.1 Association between socio-demographic and sarcopenia status

The chi-square test results of socio-demographic (age, gender, ethnicity, marital status, occupational status and household income) with sarcopenia status are shown in Table 4.10. For age and sarcopenia, it showed that elderly who aged 60 to 74 years old (81.8%) had higher prevalence in sarcopenia than elderly who aged 75 years and above (18.2%). There was no significant association between age and sarcopenia status in this study ($\chi^2=1.078$, $p=0.299$).

For gender and sarcopenia status, sarcopenia was reported higher in women (65.9%) than men (34.1%) elderly. However, there was no significant association between gender and sarcopenia status in this study ($\chi^2=0.623$, $p=0.430$).

Next, for ethnicity and sarcopenia status showed that Malay elderly (53.7%) reported prone to be sarcopenic than non-Malay elderly (47.7%) which consist of Indian and Chinese. There was a significant association between ethnicity and sarcopenia status among elderly in PPR flats Kuala Lumpur ($\chi^2=4.097$, $p=0.043$).

Marital status for single, divorced or widow elderly (56.8%) reported had slightly higher among sarcopenia than elderly who were married (43.2%). However, there was no significant association between marital status and sarcopenia status among the community-elderly who lived in PPR KL ($\chi^2=0.000$, $p=1.000$).

The prevalence of sarcopenia was high among non-working elderly (88.6%) than working elderly (11.4%). Moreover, higher prevalence of sarcopenia was also found higher in lower household income (95.5%) than high household income (4.5%). There was no significant association between occupational status and household income with sarcopenia status ($p>0.05$).

Table 4.10: Results of chi-square test of independence of association between socio-demographic and sarcopenia status.

Characteristics	n (%)		χ^2	p-value
	Sarcopenia (n=44)	Non-sarcopenia (n=38)		
Age			1.078	0.299
60 – 74 years	36 (81.8)	35 (92.1)		
75 years and above	8 (18.2)	3 (7.9)		
Gender			0.623	0.430
Men	15 (34.1)	9 (23.7)		
Women	29 (65.9)	29 (76.3)		
Ethnicity			4.097	0.043
Malay	23 (52.3)	29 (76.3)		
Non-Malay	21 (47.7)	9 (23.7)		
Marital status			0.000	1.000
Married	19 (43.2)	17 (44.7)		
Single / Divorced / Widow	25 (56.8)	21 (55.3)		
Occupational status			Fisher's Exact Test	1.000
Not working	39 (88.6)	33 (86.8)		
Working	5 (11.4)	5 (13.2)		
Household income			Fisher's Exact Test	0.497
B40 (<RM4850)	42 (95.5)	38 (100.0)		
Not B40 ($\geq$ RM4851)	2 (4.5)	0		

4.6.2 Association between body composition and sarcopenia status

Table 4.11 below showed the results of chi-square test of association between body composition and sarcopenia status. Based on the results, it showed that more than half (63.6%) of the respondents were reported had a lower BMI. There was a significant association between BMI and sarcopenia status ($\chi^2=30.582$, $p=0.000$).

Elderly who had an unhealthy (too high) BF% (84.1%) was prone to develop sarcopenia than elderly with acceptable BF% (15.9%). However, this study showed that there was no significant association between body fat percentage (BF%) and sarcopenia status.

Table 4.11: Results of chi-square test of independence of association between body composition and sarcopenia status.

Variable	n (%)		χ^2	p-value
	Sarcopenia (n=44)	Non-sarcopenia (n=38)		
Body Mass index (kg/m²)			30.582	0.000
Underweight/ Normal	28 (63.6)	1 (2.6)		
Overweight/ obesity	16 (36.4)	37 (97.4)		
Body fat percentage (%)			Fisher's Exact Test	0.063
Acceptable	7 (15.9)	1 (2.6)		
Unhealthy (too high)	37 (84.1)	37 (97.4)		
Mid-upper arm circumference (cm)			Fisher's Exact Test	0.497
Muscle wasting	2 (4.5)	0		
Normal	42 (95.5)	38 (100.0)		
Calf circumference (cm)			Fisher's Exact Test	1.000
Muscle wasting	1 (2.3)	0		
Normal	43 (97.7)	38 (100.0)		

This study also showed that there was no significant association between mid-upper arm circumference (MUAC) and calf circumference with sarcopenia status. Despite not being significantly associated ($p>0.05$), it was observed that majority of sarcopenic respondents reported had a normal MUAC (95.5%) and calf circumference (97.7%).

4.6.3 Association between physical activity and sarcopenia status

Chi-square test results between physical activity and sarcopenia status are shown in Table 4.12. Sarcopenic elderly in PPR KL reported had an acceptable physical activity level (86.4%) than low physical activity level (13.6%). Nevertheless, there was no significant association between physical activity and sarcopenia status ($\chi^2=1.358$, $p=0.244$).

Table 4.12: Results of chi-square test of independence of association between physical activity and sarcopenia status.

Variable	n (%)		χ^2	p-value
	Sarcopenia (n=44)	Non-sarcopenia (n=38)		
Physical Activity Scale for the Elderly (PASE)			1.358	0.244
Low physical activity	6 (13.6)	10 (26.3)		
Acceptable physical activity	38 (86.4)	28 (73.7)		

4.6.4 Association between nutritional status and sarcopenia status

4.6.4.1 Malnutrition and sarcopenia status

Table 4.13 below showed the results chi-square test between malnutrition and sarcopenia status. This study showed that sarcopenia respondents were reported had a normal malnutrition status (65.9%). However, there was no significant association between malnutrition and sarcopenia status ($\chi^2=3.776$, $p=0.052$).

Table 4.13: Results of chi-square test of independence of association between malnutrition and sarcopenia status.

Variable	n (%)		χ^2	p-value
	Sarcopenia (n=44)	Non-sarcopenia (n=38)		
Malnutrition status (MNA)			3.776	0.052
Normal	29 (65.9)	33 (86.8)		
At risk of malnutrition	15 (34.1)	5 (13.2)		

4.6.4.2 Dietary intake and sarcopenia status

Chi-square test results of association between dietary intake and sarcopenia status were shown in Table 4.14. None of the dietary intake regardless energy, macronutrients and micronutrients were significantly associated with sarcopenia status in this study ($p>0.05$).

More than half of the sarcopenic respondents in this study were reported did not meet the RNI for energy (61.4%) and total fat intake (65.9%). However, more than half of the sarcopenic respondents (56.8%) did meet the RNI for protein intake but there was no significant association between protein and sarcopenia status ($\chi^2=0.000$, $p=1.000$).

In term of micronutrients, most of sarcopenia elderly in this study did not meet RNI for vitamin A (52.3%), vitamin E (95.5%), vitamin K (86.4%), sodium (68.2%), iron 10% (61.4%) and zinc (90.9%). Moreover, all of the sarcopenic respondents did not meet RNI for vitamin D and calcium.

Table 4.14: Results of chi-square test of independence of association between dietary intake and sarcopenia status.

Characteristics	<i>n</i> (%)		χ^2	<i>p</i> -value
	Sarcopenia (<i>n</i> =44)	Non-sarcopenia (<i>n</i> =38)		
Energy (kcal)				
<RNI	27 (61.4)	31 (81.6)	3.108	0.078
≥RNI	17 (38.6)	7 (18.4)		
Protein (g)				
<RNI	19 (43.2)	16 (42.1)	0.000	1.000
≥RNI	25 (56.8)	22 (57.9)		
Total fat (g)				
<RNI	29 (65.9)	27 (71.1)	0.068	0.794
≥RNI	15 (34.1)	11 (28.9)		
Vitamin A (RE)				
<RNI	23 (52.3)	13 (34.2)	2.017	0.156
≥RNI	21 (47.7)	25 (65.8)		
Vitamin D (µg)				
<RNI	44 (100.0)	38 (100.0)	-	-
≥RNI	0	0		
Vitamin E (mg)				
<RNI	42 (95.5)	37 (97.4)	Fisher's Exact Test	1.000
≥RNI	2 (4.5)	1 (2.6)		
Vitamin K				
<RNI	38 (86.4)	34 (89.5)	Fisher's Exact Test	0.745
≥RNI	6 (13.6)	4 (10.5)		
Sodium (mg)				
<RNI	30 (68.2)	31 (81.6)	1.282	0.258
≥RNI	14 (31.8)	7 (18.4)		
Calcium (mg)				
<RNI	44 (100.0)	38 (100.0)	-	-
≥RNI	0	0		
Iron (mg)				
<RNI 10%	27 (61.4)	23 (60.5)	0.000	1.000
≥RNI 10%	17 (38.6)	15 (39.5)		
<RNI 15%	16 (36.4)	10 (26.3)	0.543	0.461
≥RNI 15%	28 (63.6)	28 (73.7)		

Zinc (mg)				
<RNI	40 (90.9)	37 (97.4)	Fisher's Exact Test	0.366
≥RNI	4 (9.1)	1 (2.6)		

4.6.5 Association between functional status and sarcopenia status

Table 4.15 below showed the results of chi-square test between functional and sarcopenia status in this study. According to results, higher prevalence of dependent (low function) elderly were reported among sarcopenic elderly (59.1%). However, there was no significant association between functional status and sarcopenia status in this study ($\chi^2=3.198$, $p=0.074$).

Table 4.15: Results of chi-square test of independence of association between functional and sarcopenia status.

Variable	n (%)		χ^2	p-value
	Sarcopenia (n=44)	Non-sarcopenia (n=38)		
Instrumental Activities Daily of Living (IADL)			3.198	0.074
Low function, dependent	26 (59.1)	14 (36.8)		
High function, independent	18 (40.9)	24 (63.2)		

CHAPTER 5

DISCUSSION

5.1 Socio-demographic status

Out of 5 PPR, only 3 PPR were able to visit for completing data collection which are PPR Batu Muda, PPR Seri Semarak 2 and PPR Kg. Muhibbah. Out of 160 respondents, 82 respondents were able to collect and eligible participated in this study. The low response rate for this study was due to pandemic COVID-19 and Restriction of Movement Order (RMO) which was imposed by Malaysian government from 18 March 2020 to 9 June 2020 which they restricted mass gatherings especially for face-to-face gatherings among the elderly population. According to Centers for Disease Control and Prevention (CDC), it stated that elderly were at higher risk for COVID-19 as increases age were more prone risk for severe illness. The prevalence of gender in the present study was consistent with National Health and Morbidity Survey (NHMS) 2018 in which women (52.9%) were higher among elderly compared with men elderly (47.1%). Based on WHO statement, men were reported had a short life expectancy than women.

In term of ethnicity, the results in this study where Malay elderly was 63.4% were in line with NMHS 2018 findings in which majority of the elderly was Malay (65.1%). However, in Singapore study, the majority race was Chinese (68.7%) then followed by Malay (16.5%) (Fung et al., 2019). In term of marital status, the present study was consistent with previous study in Europe in which higher prevalence of elderly who lived without partner (54.9%) than elderly who lived with their partner (45.1%) (Soósová, 2016). It contradict with findings from NHMS 2018 where more than half of the elderly (66.0%) were married then followed with single, divorced or widow elderly (34.0%). These controversial results may due to different design of study and characteristics of the participants (Perez-Sousa et al., 2019).

The occupational status among elderly in the present study was consistent with previous study by Kwak and Kim (2017) among 1431 elderly in South Korean, where 66.0% of elderly were unemployed and only 34.0% elderly were employed. However, this study did not stated whether the unemployment elderly due to no job secured or due to retirement. Due to unemployed, majority of the elderly in the present study had a low household income in which almost all of the respondents had income less than RM2500. It reported that majority of the elderly did not work in government before which they did not had a pension salary. Furthermore, most of the elderly in the present study just live with their partner and live separately with their child. Thus, the household income among the elderly in PPR KL were low.

5.2 Body composition

5.2.1 Body weight status

In the present study, it showed that more than half of the elderly had an overweight and obesity which was consistent with NHMS 2018, where 54.6% of elderly were overweight and obesity in Malaysia. It also supported by one of local study where 36.9% and 14.6% were reported overweight and obesity respectively (Rosli et al., 2017). Another local study conducted among men elderly, where 63.0% of respondents had normal BMI followed by overweight (19.3%) and obese (3.0%) which in line with the present study (Ngoh, Chen, & Harith, 2011). The changes of body composition occurred when ageing yet BMI did not differentiate the distribution of fat mass and muscle mass among elderly (McKee, A. & Morley, J. E., 2018). Grzegorzewska, Wo, and Kowalkowska (2016) stated that declined in lean mass and changes in fat distribution are very common during ageing process which may affect the BMI measurement.

5.2.2 Body fat percentage

As the body fat percentage increased, the lean mass will decreased as the increasing of age (Mhatre V. Ho & Ji-Ann Lee, 2012). It was in line with the present study in which higher prevalence of unhealthy (too high) body fat percentage among the community-dwelling elderly in PPR KL. Furthermore, increasing age also will results in accumulation of muscle fat, visceral fat and also liver fat (Ponti et al., 2020). Limited study using BIA in order to observed the body fat distribution among the elderly. Some of the study depends on the BMI measurements in and some study used waist circumference (WC) in order to classify the fat distribution among the elderly. According to NHMS (2018), waist circumference measurements was used to classify the abdominal obesity among the elderly.

5.2.3 Mid-upper arm circumference (MUAC) and calf circumference (CC)

As MUAC and CC were measured to observe the risk of muscle wasting or malnutrition among the elderly (Sakinah & Tan, 2012). A Taiwan study conducted among 329 elderly subjects reported that higher MUAC appeared had a higher BMI and CC which consistent with the present study (Weng et al., 2018). Another study conducted in India showed that elderly tend to have higher MUAC among the 711 elderly participants in order to indicate their nutritional status (Goswami et al., 2018). The mean of MUAC for this study was 26.9 ± 3.8 cm which slightly less than the present study 30.32 ± 4.86 cm. For calf circumference, the mean was 34.70 ± 3.15 cm among the elderly in Brazil which consistent with the present study 35.50 ± 3.90 cm (Pagotto, Santos, Malaquias, Bachion, & Silveira, 2018). This also similar with other previous study in China where the mean for CC was 33.10 ± 3.0 cm (Gao et al., 2015). However, both of the MUAC and CC measurements in previous study were used different cut-off points than present study in classified the muscle wasting among the elderly. The cut-off values were different in different country. The

present study showed that higher prevalence for normal MUAC and CC among the elderly. This might indicate that elderly who lived in PPR KL does not have risk of muscle wasting or malnutrition.

5.3 Physical activity

The mean in the present study (104.82 ± 46.87) showed that the score was slightly higher than the previous study conducted in Hong Kong, where the mean was 91.30 ± 43.0 among 4000 elderly respondents (Yu et al., 2014). In local study, the mean for PASE-M was 94.96 ± 62.82 score which slightly lower than the current study (Ismail et al., 2015).

The results of prevalence in the current study was contradict with finding from study in Palestine among 176 community-dwelling elderly, where about 42% of the participants had low physical activity by using physical activity socio-cultural adapted questionnaire (PA-SCAC) (Halaweh, Willen, Grimby-Ekman, & Svantesson, 2015). IPAQ score was used in study conducted by Nasimi, Dabbaghmanesh, and Sohrabi (2019), where higher prevalence of low physical activity (61.7%) than moderate physical activity (33.5%) among elderly in Iran.

However, it was consistent with NHMS (2018) findings where 70.2% was physically active and 23.2% was classified had sedentary behavior by using Global Physical Activity Questionnaire (GPAQ). The results might have different in determining the physical activity level among elderly due to different measurements tools were used. In the present study, it showed that community-dwelling elderly in PPR KL had an active community. This might due to variety of activities being conducted among the senior citizen by their club association in the committee such as PAWE and their own community club association which will make the elderly more physically active than previous study.

5.4 Nutritional status

5.4.1 Malnutrition status

According to the results (Table 4.5), it similar with previous study where 72.1% was well-nourished, 26.7% was risk of malnutrition and only 1.2% was malnutrition among 501 elderly respondents (Nasimi et al., 2019). Study in China also supported where 77.7% was well-nourished, 22.3% was at risk of malnutrition and only 2% was malnourished among Chinese elderly (Han et al., 2017). It consistent with NMHS (2018) findings, where 69.2% had normal nutritional status and 30.8% had malnutrition among the older adults. Social support and had an active community environment might results in well-nourished among elderly in the present study. Furthermore, based on the observation in current study, only few of the respondents reported had loss appetite and loss weight. Besides, majority of the respondent had a normal CC measurements which one of indicator in determined malnutrition (NHMS, 2018). This also might be the factors that community-dwelling elderly in PPR KL had a better nutritional status.

5.4.2 Dietary intake

Regarding to results (Table 4.6), almost half of the respondents reported had under-reporting. Although the prevalence of under-reports were slightly high, they were not excluded since the objective of the study was to assess nutrient intake of all community-dwelling elderly in PPR KL. Being excluded might have a big impact on the results as the current study had already small sample size.

The recommended energy intake for all respondents was opted based on physical activity level (PAL) of 1.6 as it recommended among general population. The recommended energy intake for older adults aged 60 years and above was 2030 kcal in men and 1770 kcal in women (RNI, 2017). The mean energy intake in current study was lower for both gender elderly compared with

the recommended intake by RNI 2017. This contributed to inadequate energy intake for both gender according to RNI 2017. The mean energy intake among community-dwelling elderly Japanese was higher than the current study, where 2346.6 ± 408.1 kcal/day in men and 1913.2 ± 318.3 kcal/day in women (Otsuka et al., 2016). However, this study did not stated the recommended energy intake for older adults. Another study conducted among dependent elderly, it reported that the mean energy intake was 1852.9 ± 460.4 kcal/day in men and 1747.1 ± 315.9 kcal/day in women which represent the recommended intake by Recommended Dietary Allowance (RDA) (Fernández-Barrés et al., 2016). One local study, it showed that the mean energy intake in men was 1484 ± 338 kcal and 1329 ± 307 kcal in women which lower than recommended by Malaysian RDA (2020 kcal for men and 1600 kcal for women) (Suriah et al., 1996). Regardless difference recommendation for energy intake, the previous studies showed that elderly were related with low intake of energy which consistent with the present study.

In term of macronutrients, study conducted by Otsuka et al. (2016) in Japan stated that the mean for protein, total fat and carbohydrate were 88.2 ± 17.1 g, 60.9 ± 17.3 g and 325.8 ± 66.2 among men respectively which higher compared with mean in the present study. However, this study not explained further the amount of macronutrients intake with recommended intake among elderly. The protein intake in the current study was similar with study by Fernández-Barrés et al. (2016) where the mean was 59.4 ± 14.5 g which within the RDA recommendations.

In term of micronutrients, the present study showed that elderly lack in micronutrients intake especially calcium and vitamin D. During the observation in taking dietary intake, most of the respondents were reported lack intake of dairy products which the sources of calcium. The results were similar with previous study where elderly did not meet their intakes in vitamin D, calcium, vitamin E and folates which less than the RDA recommendation (Fernández-Barrés et al.,

2016). The intake of vitamin D and vitamin D might be underestimated due to limit of food content for that particular micronutrients (Fernández-Barrés et al., 2016).

5.5 Functional status

IADL was used to observe the functional status among community-dwelling elderly in this study. The current results consistent with NHMS 2018 findings where 1 in 2 elderly need other help in performing the instrumental activities in daily living. The prevalence of IADL in the current study was contradict with one of local study where more than half of the respondents had low function (58.1%) than high function (41.9%) (Faizal Murat et al., 2019). Physical disability common among the elderly population which they had difficulties in performing daily activities living. This will increase the prevalence of dependent elderly population.

5.6 Sarcopenia

The criteria in identified sarcopenia among elderly by using AWGS was similar with EWGSOP. The difference between these criteria was the cut-off points where AWGS more into Asian population perspective (Chen et al., 2014). Based on the results (Table 4.9), it showed that community elderly in PPR KL had a low muscle strength (hand grip strength), low physical performance (gait speed) and low muscle mass (muscle mass). Participants with sarcopenia showed a lower body mass index (BMI), hand grip strength (HS), gait speed (GS), calf circumference (CC), prescribed more medications and had a low physical activity among study in community-dwelling elderly in Chinese (Gao et al., 2015).

The prevalence of sarcopenia in the present study was higher compared with previous studies which used AWGS in determined sarcopenia among elderly. Study conducted among 887 community-dwelling elderly reported that only 9.8% of respondents were sarcopenia (12.0% in

women and 6.7% in men) which major different than current study (Gao et al., 2015). Similar with study from Japan where it differentiate between gender and found that only 8.2% in men and 5.5% in women had sarcopenia (Kawakami et al., 2015). The prevalence of sarcopenia in Hong Kong was 10.8% in men and 3.7% in female among community-dwelling elderly aged ≥ 65 years old (Ho et al., 2016). However, the prevalence of sarcopenia increased in Singapore where 27.4% had sarcopenia (57.5% in women and 42.5% in men) among community-dwelling elderly (Fung et al., 2019)

In Malaysia, there were limited studies that used AWGS in identified sarcopenia among elderly. Study from Arimi Fitri et al., (2015) showed that only 7.7% of the respondents were sarcopenia (7.2% in men and 8.0% in women) which lowest compared with the current study. Another local study found that 51% of elderly had sarcopenia where 43.8% in men and 48.6% in women (Yap et al., 2020). The increases prevalence of sarcopenia in the previous study was due to combination of EWGSOP and AWGS criteria. Nevertheless, it showed that prevalence of sarcopenia status increased year by year among elderly population which need to be concerned.

5.6.1 Association between socio-demographic and sarcopenia status

Based on the results (Table 4.10), higher prevalence of sarcopenia among elderly who aged 60 to 74 years old might due to majority of this study were elderly with that age. The present results were inconsistent with findings from Rosli et al. (2017), where elderly aged 75 years and above were more prone had sarcopenia. This was due to muscle mass declines 1.5% per year after aged 50 years old which contributed to low muscle mass among elderly (Haeling et al., 2010; MI et al., 2015).

The present study also was contradict with previous study in which they reported that age was significant associated with risk of sarcopenia (Norshafarina et al., 2013; Fung et al., 2019). The older the age, the higher associate with sarcopenia ($p<0.001$) regardless of sarcopenic or sarcopenic obesity (Aggio et al., 2016). Local study conducted by Yap et al. (2020), sarcopenia was significantly associated with age group ($p<0.001$) and after adjusted the odd ratios it significant associate with elderly aged ≥ 80 years (AOR=3.63, $p=0.025$). This showed that age group was one of the risk factors that associated with sarcopenia among the elderly.

Despite of being significantly associated, the prevalence of sarcopenia in term of gender in the present study showed higher among women than men. Similar with study conducted among Chinese community-dwelling using AWGS cut-off points where women (12.0%) were found had sarcopenia than men (6.7%) (Gao et al., 2015). It contradict with previous study which in Hong Kong study by Ho et al. (2016), where men (73.6%) were higher prevalence than women (67.7%) by using AWGS cut-off values. Another study by Khongsri, Tongsuntud, Limampai, and Kuptniratsaikul (2016) in Thailand also reported that sarcopenia was higher in men (33.9%) than women (29.3%). Previous studies claimed that men was significantly associated with sarcopenia which inconsistent with the present study (Norshafarina et al., 2013; Villada et al., 2015; Dorosty, Arero, Chamar, & Tavakoli, 2016). Sarcopenia higher among men may due to poorer bioavailability of testosterone as it related with lower strength and function of muscle (Rosli et al., 2017). This controversial result may arise due to different design of study, population and characteristics among the participants (Perez-Sousa et al., 2019).

In term of ethnicity, study in Singapore showed consistent with the present study where ethnicity was associated with risk of sarcopenia ($p<0.007$) (Fung et al., 2019). The study showed that higher sarcopenia among Chinese ethnicity due to majority of the respondents were Chinese

while for the present study showed that higher prevalence of sarcopenia was among Malay ethnic due to majority of respondents were Malay. Other study in United States (U.S) reported that Hispanic elderly had highest in sarcopenic (26.79% in men; 27.18% in women) while non-Hispanic Black had lowest (8.58% in men; 1.57% in women) ($p<0.05$) (Du et al., 2018). Limited study in local study that focused on association between ethnicity and sarcopenia status.

For marital status, it was inconsistent with study by Gao et al. (2015) among 612 community-dwelling Chinese individuals where it reported that widowed elderly were prone had sarcopenia than married elderly ($p<0.001$). Similar with study in West-China where widowed or divorced elderly had higher prevalence in sarcopenic respondents than non-sarcopenic ($\chi^2=56.84$, $p<0.001$) (Liu et al., 2020). Single sarcopenic elderly were lack in practicing exercise or any physical activities due to no social support which increase development of sarcopenia (Norshafarina et al., 2013). Local study also stated that marital status was significantly associated with sarcopenia yet higher prevalence among married sarcopenic than unmarried sarcopenic ($p<0.05$) (Norshafarina et al., 2013). There was no further explanation on this mechanism.

In term of occupational status and household income, the current study was inconsistent with the finding by Dorosty, Arero, Chamar & Tavakoli (2016) where it reported that those with no occupation and low-income were significantly higher in sarcopenia subjects ($p<0.01$). This might due to low protein intake among low SES as protein food more expensive than other food which results in constant deprivation of protein in body that lead in sarcopenia (Shahar et al., 2019). There were lack of observation between occupations, income and sarcopenia status in previous study.

5.6.2 Association between body composition and sarcopenia status

According to the BMI results, it was similar with previous study in Tokyo where it reported that sarcopenia respondents had significantly associated with lower BMI than non-sarcopenia ($p<0.001$) (Kawakami et al., 2015). Study conducted by Morandi et al. (2015) in Italy, where it also claimed that higher prevalence of sarcopenia was associated with lower BMI ($p=0.03$). Another study by Tay et al. (2015) in Singapore among Chinese community-dwelling elderly, where lower BMI was significant associated among sarcopenia subject ($p<0.001$). Lower BMI among sarcopenia status might due to prominent muscle wasting where loss of muscle mass with or without loss of fat mass in which associated with increasing in sarcopenia (Cruz-Jentoft et al., 2010; Sieber, 2019).

The current study was inconsistent with finding by Krause et al. (2012), where free-fat mass index only correlated with maximum handgrip strength ($r=0.636$, $p<0.05$) and waist circumference ($r=0.771$, $p<0.01$) among sarcopenic individuals. Study in Canada also supported the statement where fat-free mass and waist circumference significantly associated with sarcopenic in elderly population (Krause et al., 2012).

In term of calf circumference, it was contradicted with previous study where there was positively correlation between calf circumferences with appendicular skeletal muscle (ASM) and slow gait speed which these were characteristics in determined sarcopenia ($p<0.05$) (Kawakami et al., 2015; Sun et al., 2017). Decreasing of calf circumference which loss of muscle mass may results in leg edema (Kawakami et al., 2015). Moreover, lower calf circumference can contributed to decline in muscle mass or lean tissue that lead to sarcopenia (Shahar et al., 2019). There was lack in study reported that MUAC was associated with sarcopenia status. MUAC was used in determined the nutritional status among elderly not into depth among sarcopenic elderly.

5.6.3 Association between physical activity and sarcopenia status

The results in the present study was consistent with previous study in Hong Kong, where physical activity level was not associated with sarcopenia status among the elderly (Yu et al., 2014). However, it was contradicted with study conducted among 387 respondents in Singapore which claimed that elderly who engaged in light house work ($OR=1.75$, $p=0.043$) or volunteered ($OR=2.00$, $p=0.004$) were more associate with higher risk of sarcopenia compared with elderly who had sedentary lifestyle ($OR=0.998$, $p=0.005$) (Fung et al., 2019). Contradict with findings from study in United Kingdom (U.K) stated that sedentary behavior more higher among sarcopenic respondents ($p<0.001$) (Aggio et al., 2016). Another study conducted in Italy also reported that low physical activity (PASE score) were highly related with low muscle mass and strength ($p<0.001$) (Curcio et al., 2019). Furthermore, exercise is one of the intervention in treating sarcopenia among elderly (Moore et al., 2019).

Despite being not significantly associated in the present data, it showed that prevalence of acceptable physical activity level were more higher among sarcopenic respondents which inconsistent with previous study where high level of physical activity was associated with lower prevalence of sarcopenia (Frontera, 2019). This might due to the PASE questionnaire did not really distinguished the intensity level of physical activity as the scores depends on the lowest tertile that considered as low physical activity (Singh, Rahman, Rajaratnam, Yi, & Shahrar, 2018). The results in the present study might also due to majority of the elderly had an acceptable physical activity.

5.6.4 Association between nutritional status and sarcopenia status

5.6.4.1 Malnutrition status and sarcopenia status

Current study was inconsistent with the previous studies where malnutrition was highly significant associated with sarcopenia status. Study conducted by Tramontano et al. (2017) in South America, where sarcopenic had lower MNA score which indicate at risk of malnutrition or malnourished than non-sarcopenic elderly ($p < 0.0001$). Another study reported that risk of malnutrition significantly associate with sarcopenia elderly where higher prevalence found among female sarcopenia ($p = 0.007$) (Tay et al., 2015). One of the factors malnutrition among elderly was due reduced adequate protein intake, the building blocks for muscle metabolism which results in protein-energy malnutrition (PEM) (Sieber, 2019).

5.6.4.2 Dietary intake and sarcopenia status

In term of energy and macronutrients, study conducted among Korean elderly reported that energy ($p = 0.005$) and protein intake ($p = 0.046$) were highly significant associate with sarcopenia and sarcopenic obesity (Lim et al., 2018). Previous study also claimed that higher risk of sarcopenia was significantly associated with the consumption of protein ($p = 0.041$) (Fung et al., 2019). Study that conducted among hospitalization elderly stated that stroke patients with sarcopenia had significantly improved the muscle mass and strength after eight weeks of administration of a leucine-enriched amino acid supplements (Yoshimura et al., 2019). Other macronutrients were not observed with sarcopenia in the previous study as sarcopenia is loss of muscle mass which more related with protein (Sieber, 2019).

In term of micronutrients, there were only few previous studies that showed the significantly association with sarcopenic elderly. (Wicks et al., 2018) reported that there was an

association between vitamin E level and sarcopenia where consumption of vitamin E supplementation may delay or prevent muscle wasting among elderly. Another study stated that vitamin D also was significantly associated with the increased of muscle mass and also functional parameters in which will improved sarcopenia among elderly (Bautmans et al., 2015).

5.6.5 Association between functional status and sarcopenia status

The result in the present study was contradict with study conducted among 280 patients in rehabilitation ward, where it stated that sarcopenia significant associate with worse functional status by using Barthel Index (BI) score ($p < 0.0001$) (Morandi et al., 2015). The admission to in-hospital affect the functional performance due limited movement among the respondents. Study conducted among community-dwelling in Taiwan also reported that higher prevalence of sarcopenia was highly associated with low functional performance ($p < 0.001$) (Wu et al., 2014). Santos et al., 2014 study claimed that mobility or IADL disability was associated with sarcopenia (relative risk ratio=2.23, 95% CI: 1.03-4.85). All of the previous study above were using EWGSOP (2010) in determined sarcopenia among the elderly which differed in classified sarcopenia among the elderly.

Regardless of being significantly associate, the present data showed that higher prevalence of dependent (low function) among sarcopenic respondents. This was due to low muscle mass which one of characteristics in determining sarcopenia was related with low muscle function among elderly (Bahat et al., 2018).

CHAPTER 6

CONCLUSION AND RECOMMENCATIONS

6.1 Conclusion

The study has been conducted in PPR Batu Muda, PPR Seri Semarak 2 and PPR Kg. Muhibbah which all those PPR flats located at Kuala Lumpur. A total of 82 respondents age 60 years and above were selected randomly based on inclusion and exclusion criteria of the study. 58 of the respondents were women and 24 respondents were men.

Poor nutritional status in which higher prevalence of overweight, unhealthy (too high) BF%, energy, macronutrients and micronutrients inadequacy) was found among community-dwelling elderly in PPR KL. Intervention program need to be implemented among elderly regardless in community or hospital setting to increase their awareness and health status.

A higher prevalence of sarcopenia among community-dwelling elderly was found in this study. This has raised the awareness where other researchers need to develop standardized intervention and treatment in order reducing the risk of sarcopenia among elderly.

As reflected from the results of current study, it shown that there was significant associated between ethnicity ($\chi^2=4.097$, $p=0.043$) and BMI ($\chi^2=30.582$, $p=0.000$) with sarcopenia status. However, there was no association found between physical activity ($\chi^2=1.358$, $p=0.244$), malnutrition status ($\chi^2=3.776$, $p=0.052$), dietary intake ($p>0.05$) and functional status ($\chi^2=3.198$, $p=0.074$) with sarcopenia.

As conclusion, AWGS 2014 criterion shows that sarcopenia is common geriatric syndrome among elderly who aged 60 years and above and lived in PPR Kuala Lumpur.

6.2 Limitation of the study

The present study has several limitations that must be considered. Firstly, due to pandemic COVID-19 and Restriction of Movement Order (RMO) that imposed by Malaysian government interrupt the data collection process. As a result, minimum sample size in this study did not achieved which affect the results obtained. Secondly, no alternative method can be done in completing the data collection as elderly population do not know how to do the online questionnaires. Moreover, elderly who lived in PPR had low income and less facilities in accessing the internet. It might disadvantage for elderly who had blurry eyes due to ageing process.

Thirdly, the findings in the current study cannot be generalize for whole elderly population in Kuala Lumpur. This is because the present study only focused elderly who lived in PPR flats not the entire houses in Kuala Lumpur. Fourthly, this study was a cross-sectional study, in which the temporal relationship between the variables could not be determined.

Finally, the questionnaire too lengthen which might affect the mood of the elderly. It also time consuming which make the respondents do not want to answer the questions that being asked by the interviewer. This might affect the results obtained later.

6.2 Recommendations

The present study showed the small sample size were obtained which affect the results, future studies need to larger the sample size in order to generalize for the whole elderly population in KL. Besides, other researchers might used longitudinal study in gaining better understanding of the association factors with sarcopenia status.

As higher prevalence of sarcopenia among elderly increased the awareness about the seriousness of this geriatric syndrome. In future studies, researchers might include elderly who

aged 50 years and above to observe the development of sarcopenia status among pre-elderly in Kuala Lumpur by using AWGS 2014 criteria.

Other than that, factor such as psychological variables was limited in previous study and did not included in this study which might relating with sarcopenia. In future studies, this factors should be included in their study in order to assess its association with sarcopenia among elderly. Anthropometric measurements such as waist circumference also should be included as it can assess sarcopenia among obesity elderly as elderly increases the fat muscle as increase their age.

REFERENCES

- Ageing and health. (2018). Retrieved from <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>.
- Aggio, D. A., Sartini, C., Papacosta, O., Lennon, L. T., Ash, S., Whincup, P. H., ... Jefferis, B. J. (2016). Cross-sectional associations of objectively measured physical activity and sedentary time with sarcopenia and sarcopenic obesity in older men. *Preventive Medicine*, 91, 264–272. <https://doi.org/10.1016/j.ypmed.2016.08.040>
- Alemán-Mateo, H., Macías, L., Esparza-Romero, J., Astiazaran-García, H., & Blancas, A. L. (2012). Physiological effects beyond the significant gain in muscle mass in sarcopenic elderly men: Evidence from a randomized clinical trial using a protein-rich food. *Clinical Interventions in Aging*, 7, 225–234. <https://doi.org/10.2147/CIA.S32356>
- Badrasawi, M., Shahar, S., & Kaur Ajit Singh, D. (2017). Risk Factors of Frailty Among Multi-Ethnic Malaysian Older Adults. *International Journal of Gerontology*, 11(3), 154–160. <https://doi.org/10.1016/j.ijge.2016.07.006>
- Bahat, G., Saka, B., Tufan, F., Akin, S., Sivrikaya, S., Yucel, N., ... Karan, M. A. (2010). Prevalence of sarcopenia and its association with functional and nutritional status among male residents in a nursing home in Turkey. *Aging Male*, 13(3), 211–214. <https://doi.org/10.3109/13685538.2010.489130>
- Beasley, J. M., Shikany, J. M., & Thomson, C. A. (2013). The role of dietary protein intake in the prevention of sarcopenia of aging. *Nutrition in Clinical Practice*, 28(6), 684–690. <https://doi.org/10.1177/0884533613507607>
- Bernabei, R., Martone, A. M., Vetrano, D. L., Calvani, R., Landi, F., & Marzetti, E. (2014). Frailty, Physical Frailty, Sarcopenia: A New Conceptual Model. *Studies in Health Technology and Informatics*, 203, 78–84. <https://doi.org/10.3233/978-1-61499-425-1-78>
- Chen, L. K., Lee, W. J., Peng, L. N., Liu, L. K., Arai, H., & Akishita, M. (2016). Recent Advances in Sarcopenia Research in Asia: 2016 Update From the Asian Working Group for Sarcopenia. *Journal of the American Medical Directors Association*, 17(8), 767.e1-767.e7. <https://doi.org/10.1016/j.jamda.2016.05.016>
- Chen, L. K., Liu, L. K., Woo, J., Assantachai, P., Auyeung, T. W., Bahyah, K. S., ... Arai, H. (2014). Sarcopenia in Asia: Consensus report of the Asian working group for sarcopenia. *Journal of the American Medical Directors Association*, 15(2), 95–101. <https://doi.org/10.1016/j.jamda.2013.11.025>
- Cruz-Jentoft, A. J., Baeyens, J. P., Bauer, J. M., Boirie, Y., Cederholm, T., Landi, F., ... Zamboni, M. (2010). Sarcopenia: European consensus on definition and diagnosis. *Age and Ageing*, 39(4), 412–423. <https://doi.org/10.1093/ageing/afq034>
- Cruz-Jentoft, A. J., Landi, F., Schneider, S. M., Zuniga, C., Arai, H., Boirie, Y., ... Cederholm, T. (2014). Prevalence of and interventions for sarcopenia in ageing adults: a systematic review. Report of the International Sarcopenia Initiative (EWGSOP and IWGS). *Age and Ageing*, 43(6), 748–759. <https://doi.org/10.1093/ageing/afu115>

- Curcio, F., Liguori, I., Cellulare, M., Sasso, G., Della-Morte, D., Gargiulo, G., ... Abete, P. (2019). Physical Activity Scale for the Elderly (PASE) Score Is Related to Sarcopenia in Noninstitutionalized Older Adults. *Journal of Geriatric Physical Therapy* (2001), 42(3), 130–135. <https://doi.org/10.1519/JPT.0000000000000139>
- Du, K., Goates, S., Arensberg, M. B., Pereira, S., & Gaillard, T. (2018). Prevalence of Sarcopenia and Sarcopenic Obesity Vary with Race / Ethnicity and Advancing Age, 15, 175–183.
- Estrada, M., Kleppinger, A., Judge, J. O., Walsh, S. J., & Kuchel, G. A. (2007). Functional impact of relative versus absolute sarcopenia in healthy older women. *Journal of the American Geriatrics Society*, 55(11), 1712–1719. <https://doi.org/10.1111/j.1532-5415.2007.01436.x>
- Falsarella, G. R., Coimbra, I. B., Barcelos, C. C., Iartelli, I., Montedori, K. T., Santos, M. N. J., ... Coimbra, A. M. V. (2014). Influence of muscle mass and bone mass on the mobility of elderly women: An observational study. *BMC Geriatrics*, 14(1). <https://doi.org/10.1186/1471-2318-14-13>
- Frontera, W. R. (2019). *Chapter 2 - Sarcopenia. Geriatric Rehabilitation*. Elsevier Inc. <https://doi.org/10.1016/B978-0-323-54454-2.00002-9>
- Fung, F. Y., Koh, Y. L. E., Malhotra, R., Ostbye, T., Lee, P. Y., Shariff Ghazali, S., & Tan, N. C. (2019). Prevalence of and factors associated with sarcopenia among multi-ethnic ambulatory older Asians with type 2 diabetes mellitus in a primary care setting. *BMC Geriatrics*, 19(1), 1–10. <https://doi.org/10.1186/s12877-019-1137-8>
- Gabat, J. A. L., Faltado, A. L., Sedurante, M. B., & Tee, M. L. (2018). Association of obesity and sarcopenia among adult Filipinos. *Osteoporosis and Sarcopenia*, 4(3), 109–113. <https://doi.org/10.1016/j.afos.2018.08.001>
- Gao, L., Jiang, J., Yang, M., Hao, Q., Luo, L., & Dong, B. (2015). Prevalence of Sarcopenia and Associated Factors in Chinese Community-Dwelling Elderly: Comparison Between Rural and Urban Areas. *Journal of the American Medical Directors Association*, 16(11), 1003.e1–1003.e6. <https://doi.org/10.1016/j.jamda.2015.07.020>
- Gianoudis, J., Bailey, C. A., & Daly, R. M. (2014). Associations between sedentary behaviour and body composition, muscle function and sarcopenia in community-dwelling older adults. *Osteoporosis International*, 26(2), 571–579. <https://doi.org/10.1007/s00198-014-2895-y>
- Goswami, A. K., Kalaivani, M., Gupta, S. K., Nongkynrih, B., & Pandav, C. S. (2018). Usefulness of Mid-Upper Arm Circumference in Assessment of Nutritional Status of Elderly Persons in Urban India. *International Journal of Medicine and Public Health*, 8(1), 34–37. <https://doi.org/10.5530/ijmedph.2018.1.7>
- Ho, A. W. H., Lee, M. M. L., Chan, E. W. C., Ng, H. M. Y., Lee, C. W., Ng, W. S., & Wong, S. H. (2016). Prevalence of pre-sarcopenia and sarcopenia in Hong Kong chinese geriatric patients with hip fracture and its correlation with different factors. *Hong Kong Medical Journal*, 22(1), 23–29. <https://doi.org/10.12809/hkmj154570>
- Houston, D. K., Nicklas, B. J., Ding, J., Harris, T. B., Tylavsky, F. A., Newman, A. B., ... Kritchevsky, S. B. (2008). Dietary protein intake is associated with lean mass change in older, community-dwelling adults: The Health, Aging, and Body Composition (Health ABC) study.

- American Journal of Clinical Nutrition*, 87(1), 150–155.
<https://doi.org/10.1093/ajcn/87.1.150>
- Ishii, S., Tanaka, T., Shibasaki, K., Ouchi, Y., Kikutani, T., Higashiguchi, T., ... Iijima, K. (2014). Development of a simple screening test for sarcopenia in older adults. *Geriatrics and Gerontology International*, 14(SUPPL.1), 93–101. <https://doi.org/10.1111/ggi.12197>
- Ismail, N., Hairi, F., Choo, W. Y., Hairi, N. N., Peramalah, D., & Bulgiba, A. (2015). The Physical Activity Scale for the Elderly (PASE): Validity and reliability among community-dwelling older adults in Malaysia. *Asia-Pacific Journal of Public Health*, 27, 62S–72S. <https://doi.org/10.1177/1010539515590179>
- Kawakami, R., Murakami, H., Sanada, K., Tanaka, N., Sawada, S. S., Tabata, I., ... Miyachi, M. (2015). Calf circumference as a surrogate marker of muscle mass for diagnosing sarcopenia in Japanese men and women. *Geriatrics and Gerontology International*, 15(8), 969–976. <https://doi.org/10.1111/ggi.12377>
- Khongsri, N., Tongsuntud, S., Limampai, P., & Kuptniratsaikul, V. (2016). The prevalence of sarcopenia and related factors in a community-dwelling elders Thai population. *Osteoporosis and Sarcopenia*, 2(2), 110–115. <https://doi.org/10.1016/j.afos.2016.05.001>
- Khor, S. C., Abdul Karim, N., Wan Ngah, W. Z., Mohd Yusof, Y. A., & Makpol, S. (2014). Vitamin e in sarcopenia: Current evidences on its role in prevention and treatment. *Oxidative Medicine and Cellular Longevity*, 2014. <https://doi.org/10.1155/2014/914853>
- Kim, N. H., Kim, H. S., Eun, C. R., Seo, J. A., Cho, H. J., Kim, S. G., ... Kim, N. H. (2011). Depression is associated with sarcopenia, not central obesity, in elderly Korean men. *Journal of the American Geriatrics Society*, 59(11), 2062–2068. <https://doi.org/10.1111/j.1532-5415.2011.03664.x>
- Krause, K. E., McIntosh, E. I., & Vallis, L. A. (2012). Sarcopenia and predictors of the fat free mass index in community-dwelling and assisted-living older men and women. *Gait and Posture*, 35(2), 180–185. <https://doi.org/10.1016/j.gaitpost.2011.09.003>
- Kwak, Y., & Kim, Y. (2017). Health-related quality of life and mental health of elderly by occupational status. *Iranian Journal of Public Health*, 46(8), 1028–1037.
- Lim, H.-S., Park, Y.-H., Suh, K., Yoo, M. H., Park, H. K., Kim, H. J., ... Byun, D.-W. (2018). Association between Sarcopenia, Sarcopenic Obesity, and Chronic Disease in Korean Elderly. *Journal of Bone Metabolism*, 25(3), 187. <https://doi.org/10.11005/jbm.2018.25.3.187>
- Maeda, K., & Akagi, J. (2015). Decreased Tongue Pressure is Associated with Sarcopenia and Sarcopenic Dysphagia in the Elderly. *Dysphagia*, 30(1), 80–87. <https://doi.org/10.1007/s00455-014-9577-y>
- ML, A. F., Clark, B. C., Shahar, S., Manaf, Z., Kaur, D., Sigh, A., ... Loo, W. H. (2015). Characterisation of Sarcopenia in Malaysian Elders Using the Asian Working Group on Sarcopenia and the European Working Group on Sarcopenia in Older People Consensus Definitions, (June), 3–4.
- Mohd Nawi, S. N., Khaw, K. S., Lim, W. S., & Yu, S. C. (2019). Screening Tools for Sarcopenia in Community-Dwellers: A Scoping Review. *Annals of the Academy of Medicine, Singapore*,

- 48(7), 201–216. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/31495866>
- Moore, S. A., Hrisos, N., Errington, L., Rochester, L., Rodgers, H., Witham, M., & Sayer, A. A. (2019). Exercise as a treatment for sarcopenia: An umbrella review of systematic review evidence. *Physiotherapy*. <https://doi.org/10.1016/j.physio.2019.08.005>
- Morandi, A., Onder, G., Fodri, L., Sanniti, A., Schnelle, J., Simmons, S., ... Bellelli, G. (2015). The Association Between the Probability of Sarcopenia and Functional Outcomes in Older Patients Undergoing In-Hospital Rehabilitation. *Journal of the American Medical Directors Association*, 16(11), 951–956. <https://doi.org/10.1016/j.jamda.2015.05.010>
- Morley, J. E., Anker, S. D., & von Haehling, S. (2014). Prevalence, incidence, and clinical impact of sarcopenia: facts, numbers, and epidemiology—update 2014. *Journal of Cachexia, Sarcopenia and Muscle*, 5(4), 253–259. <https://doi.org/10.1007/s13539-014-0161-y>
- Nipp, R. D., Fuchs, G., El-Jawahri, A., Mario, J., Troschel, F. M., Greer, J. A., ... Fintelmann, F. J. (2018). Sarcopenia Is Associated with Quality of Life and Depression in Patients with Advanced Cancer. *The Oncologist*, 23(1), 97–104. <https://doi.org/10.1634/theoncologist.2017-0255>
- Norshafarina, S. K., Noor Ibrahim, M. S., Suzana, S., Mohamad Hasnan, A., Zahara, M., & Zaitun, Y. (2013). Sarcopenia and its impact on health: Do they have significant associations? *Sains Malaysiana*, 42(9), 1345–1355.
- Otsuka, R., Kato, Y., Nishita, Y., Tange, C., Tomida, M., Nakamoto, M., ... Shimokata, H. (2016). Age-related changes in energy intake and weight in community-dwelling middle-aged and elderly Japanese. *Journal of Nutrition, Health and Aging*, 20(4), 383–390. <https://doi.org/10.1007/s12603-016-0715-0>
- Pagotto, V., Santos, K. F. Dos, Malaquias, S. G., Bachion, M. M., & Silveira, E. A. (2018). Calf circumference: clinical validation for evaluation of muscle mass in the elderly. *Revista Brasileira de Enfermagem*, 71(2), 322–328. <https://doi.org/10.1590/0034-7167-2017-0121>
- Park, H., Park, S., Shephard, R. J., & Aoyagi, Y. (2010). Yearlong physical activity and sarcopenia in older adults: The Nakanojo Study. *European Journal of Applied Physiology*, 109(5), 953–961. <https://doi.org/10.1007/s00421-010-1424-8>
- Patel, H. P., Syddall, H. E., Jameson, K., Robinson, S., Denison, H., Roberts, H. C., ... Sayer, A. A. (2013). Prevalence of sarcopenia in community-dwelling older people in the UK using the European Working Group on Sarcopenia in Older People (EWGSOP) definition: Findings from the Hertfordshire Cohort Study (HCS). *Age and Ageing*, 42(3), 378–384. <https://doi.org/10.1093/ageing/afs197>
- Perez-Sousa, M. A., Venegas-Sanabria, L. C., Chavarro-Carvajal, D. A., Cano-Gutierrez, C. A., Izquierdo, M., Correa-Bautista, J. E., & Ramírez-Vélez, R. (2019). Gait speed as a mediator of the effect of sarcopenia on dependency in activities of daily living. *Journal of Cachexia, Sarcopenia and Muscle*, (May), 1009–1015. <https://doi.org/10.1002/jcsm.12444>
- Ponti, F., Santoro, A., Mercatelli, D., Gasperini, C., Conte, M., Martucci, M., ... Bazzocchi, A. (2020). Aging and Imaging Assessment of Body Composition: From Fat to Facts. *Frontiers in Endocrinology*, 10(January). <https://doi.org/10.3389/fendo.2019.00861>

- Ribeiro, S. M. L., & Kehayias, J. J. (2014). Sarcopenia and the Analysis of Body Composition^{1,2}. *Advances in Nutrition*, 5(3), 260–267. <https://doi.org/10.3945/an.113.005256>
- ROSLI, H., SHAHAR, S., BADRASAWI, M., SINGH, D. K. A., & MOHAMED SAKIAN, N. I. (2017). Identification of Older Adults with Sarcopenia: Comparison of Two Methods. *Jurnal Sains Kesihatan Malaysia*, 15(02), 103–108. <https://doi.org/10.17576/jskm-2017-1502-04>
- Ryu, M., Jo, J., Lee, Y., Chung, Y. S., Kim, K. M., & Baek, W. C. (2013). Association of physical activity with sarcopenia and sarcopenic obesity in community-dwelling older adults: The fourth Korea National Health and Nutrition Examination Survey. *Age and Ageing*, 42(6), 734–740. <https://doi.org/10.1093/ageing/aft063>
- Sakinah, H., & Tan, S. L. (2012). Validity of a local nutritional screening tool in hospitalized Malaysian elderly patients. *Health and Environmental Journal*, 3(3), 59–65. Retrieved from <http://www.hej.kk.usm.my/pdf/HEJVol.3No.3/Article09.pdf>
- Sanada, K., Chen, R., Willcox, B., Ohara, T., Wen, A., Takenaka, C., & Masaki, K. (2018). Association of sarcopenic obesity predicted by anthropometric measurements and 24-y all-cause mortality in elderly men: The Kuakini Honolulu Heart Program. *Nutrition*, 46, 97–102. <https://doi.org/10.1016/j.nut.2017.09.003>
- Santilli, V., Bernetti, A., Mangone, M., & Paoloni, M. (2014). Clinical definition of sarcopenia. *Clinical Cases in Mineral and Bone Metabolism*, 11(3), 177–180. <https://doi.org/10.11138/ccmbm/2014.11.3.177>
- Shafiee, G., Keshtkar, A., Soltani, A., Ahadi, Z., Larijani, B., & Heshmat, R. (2017). Prevalence of sarcopenia in the world: A systematic review and meta- analysis of general population studies. *Journal of Diabetes and Metabolic Disorders*, 16(1), 1–10. <https://doi.org/10.1186/s40200-017-0302-x>
- Shahar, S., Vanoh, D., Mat Ludin, A. F., Singh, D. K. A., & Hamid, T. A. (2019). Factors associated with poor socioeconomic status among Malaysian older adults: An analysis according to urban and rural settings. *BMC Public Health*, 19(Suppl 4), 1–12. <https://doi.org/10.1186/s12889-019-6866-2>
- Sieber, C. C. (2019). Malnutrition and sarcopenia. *Aging Clinical and Experimental Research*, 31(6), 793–798. <https://doi.org/10.1007/s40520-019-01170-1>
- Singh, D. K. A., Rahman, N. N. A. A., Rajaratnam, B. S., Yi, T. C., & Shahar, S. (2018). Validity and reliability of physical activity scale for elderly in Malay language (PASE-M). *Malaysian Journal of Public Health Medicine*, 2018(Specialissue1), 116–123.
- Soósová, Mária Sováiová. “Determinants of Quality of Life in the Elderly.” *Central European Journal of Nursing and Midwifery*, vol. 7, no. 3, Central European Journal of Nursing and Midwifery, 2016, pp. 484–93, doi:10.15452/CEJNM.2016.07.0019.
- Steffl, M., Bohannon, R. W., Sontakova, L., Tufano, J. J., Shiells, K., & Holmerova, I. (2017). Relationship between sarcopenia and physical activity in older people: A systematic review and meta-analysis. *Clinical Interventions in Aging*, 12, 835–845. <https://doi.org/10.2147/CIA.S132940>
- Stoevers, K., Heber, A., Eichberg, S., & Brixius, K. (2017). Sarcopenia and Predictors of Skeletal

- Muscle Mass in Elderly Men With and Without Obesity. *Gerontology and Geriatric Medicine*, 3, 233372141771363. <https://doi.org/10.1177/2333721417713637>
- Sun, Y. S., Kao, T. W., Chang, Y. W., Fang, W. H., Wang, C. C., Wu, L. W., ... Chen, W. L. (2017). Calf Circumference as a Novel Tool for Risk of Disability of the Elderly Population. *Scientific Reports*, 7(1), 1–7. <https://doi.org/10.1038/s41598-017-16347-9>
- Suriah, A. R., Zainorni, M. J., Shafawi, S., Mimie Suraya, S., Zarina, N., Wan Zainuddin, W. A., & Zalifah, M. K. (1996). Nutrient intake among elderly in southern Peninsular Malaysia. *Malaysian Journal of Nutrition*, 2(1), 11–19.
- Tay, L., Ding, Y. Y., Leung, B. P., Ismail, N. H., Yeo, A., Yew, S., ... Chong, M. S. (2015). Sex-specific differences in risk factors for sarcopenia amongst community-dwelling older adults. *Age*, 37(6), 1–12. <https://doi.org/10.1007/s11357-015-9860-3>
- Teh, E. E., & Hasanah Che Ismail. (2005). Validation of Malay Version of Geriatric Depression Scale among Elderly Inpatients. *University Sains Malaysia*.
- Tramontano, A., Veronese, N., Sergi, G., Manzato, E., Rodriguez-Hurtado, D., Maggi, S., ... Giantin, V. (2017). Prevalence of sarcopenia and associated factors in the healthy older adults of the Peruvian Andes. *Archives of Gerontology and Geriatrics*, 68, 49–54. <https://doi.org/10.1016/j.archger.2016.09.002>
- Van Kan, G. A., Cesari, M., Gillette-Guyonnet, S., Dupuy, C., Nourhashemi, F., Schott, A. M., ... Rolland, Y. (2013). Sarcopenia and cognitive impairment in elderly women: Results from the EPIDOS cohort. *Age and Ageing*, 42(2), 196–202. <https://doi.org/10.1093/ageing/afs173>
- Villada, F. A. P., Franco, S. A. A., & De Paz Fernández, J. A. (2015). Sarcopenia en personas mayores de 60 años residentes en la comunidad de una ciudad del norte de España: Relación entre sus criterios diagnósticos y asociación con el rendimiento funcional. *Nutrición Hospitalaria*, 31(5), 2154–2160. <https://doi.org/10.3305/nh.2015.31.5.8002>
- Volkert, D., & Schrader, E. (2013). Dietary assessment methods for older persons: What is the best approach? *Current Opinion in Clinical Nutrition and Metabolic Care*, 16(5), 534–540. <https://doi.org/10.1097/MCO.0b013e328363c8d1>
- Weng, C. H., Tien, C. P., Li, C. I., L'Heureux, A., Liu, C. S., Lin, C. H., ... Lin, W. Y. (2018). Mid-upper arm circumference, calf circumference and mortality in Chinese long-term care facility residents: A prospective cohort study. *BMJ Open*, 8(5), 10–12. <https://doi.org/10.1136/bmjopen-2017-020485>
- Wicks, S. M., Salamon, I., Calderon, A. I., Carcache de Blanco, E. J., & Mahady, G. B. (2018). Sarcopenia, Diabetes, and Nutritional Intervention. *Nutritional and Therapeutic Interventions for Diabetes and Metabolic Syndrome*, 279–292. <https://doi.org/10.1016/b978-0-12-812019-4.00023-4>
- Wu, C. H., Chen, K. T., Hou, M. T., Chang, Y. F., Chang, C. S., Liu, P. Y., ... Chen, C. Y. (2014). Prevalence and associated factors of sarcopenia and severe sarcopenia in older Taiwanese living in rural community: The Tianliao Old People study 04. *Geriatrics and Gerontology International*, 14(SUPPL.1), 69–75. <https://doi.org/10.1111/ggi.12233>
- Wu, I. C., Lin, C. C., Hsiung, C. A., Wang, C. Y., Wu, C. H., Chan, D. C. D., ... Tsai, Y. F. (2014).

- Epidemiology of sarcopenia among community-dwelling older adults in Taiwan: A pooled analysis for a broader adoption of sarcopenia assessments. *Geriatrics and Gerontology International*, 14(SUPPL.1), 52–60. <https://doi.org/10.1111/ggi.12193>
- Yang, M., Hu, X., Xie, L., Zhang, L., Zhou, J., Lin, J., ... Wu, L. (2018). SARC-F for sarcopenia screening in community-dwelling older adults Are 3 items enough? *Medicine (United States)*, 97(30). <https://doi.org/10.1097/MD.00000000000011726>
- Yap, S. F., Boo, N. Y., Pramod, D. S., Thaw, Z., Liew, S. F., Woo, L. F., ... Hatta, N. M. (2020). Risk factors associated with sarcopenia among independently mobile, institutionalised older people in the Klang valley of Malaysia: A cross-sectional study. *Malaysian Journal of Medical Sciences*, 27(2), 120–128. <https://doi.org/10.21315/mjms2020.27.2.13>
- Yoshimura, Y., Bise, T., Shimazu, S., Tanoue, M., Tomioka, Y., Araki, M., ... Takatsuki, F. (2019). Effects of a leucine-enriched amino acid supplement on muscle mass, muscle strength, and physical function in post-stroke patients with sarcopenia: A randomized controlled trial. *Nutrition*, 58, 1–6. <https://doi.org/10.1016/j.nut.2018.05.028>
- Yu, R., Wong, M., Leung, J., Lee, J., Auyeung, T. W., & Woo, J. (2014). Incidence, reversibility, risk factors and the protective effect of high body mass index against sarcopenia in community-dwelling older Chinese adults. *Geriatrics and Gerontology International*, 14(SUPPL.1), 15–28. <https://doi.org/10.1111/ggi.12220>

APPENDICES

APPENDIX I

Research consent to DBKL


FAKULTI PERUBATAN DAN SAINS KESIHATAN
Faculty of Medicine and Health Sciences

Tarikh : 28 March 2019

En. Hj. Anwar bin Mohd Zain,
Pengerah,
Jabatan Pembangunan Komuniti dan Kesejahteraan Bandar,
Dewan Bandaraya Kuala Lumpur (DBKL),
Tingkat 4-9, Menara DBKL 3, Bandar Wawasan,
Jalan Raja Abdullah,
50300 Kuala Lumpur,

Tuan,

MEMOHON KEBENARAN UNTUK MENDAPATKAN SENARAI FLAT PROJEK PERUMAHAN RAKYAT (PPR) DI KUALA LUMPUR SERTA MENJALANKAN PENYELIDIKAN DALAM KALANGAN PENDUDUK WARGA EMAS DI FLAT PPR KUALA LUMPUR

Dengan segala hormatnya dimaklumkan bahawa seorang pelajar dari program Doktor Falsafah (Pemakanan Komuniti) dari Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan, UPM bercadang untuk menjalankan kajian kesihatan dalam kalangan penduduk warga emas (berusia 60 tahun ke atas) di flat PPR Kuala Lumpur. Berikut ialah nama pelajar dan tajuk kajian yang dicadangkan:

Nama Pelajar : Nurul Izzati binti Mohd Suffian (No Matrik: GS54397)
Tajuk Kajian : Penilaian tahap penerimaan bahan pendidikan dan tahap pelaksanaan modul intervensi frailty dalam kalangan warga tua di flat PPR Kuala Lumpur

2. Tujuan utama kajian ini adalah untuk menilai tahap penerimaan bahan pendidikan dan tahap pelaksanaan modul intervensi frailty dalam kalangan warga tua.

3. Sehubungan itu, saya berhasrat untuk mendapatkan maklumat berikut:

i) Senarai flat PPR di Kuala Lumpur (berserta alamat kawasan)
ii) Nama dan nombor telefon pegawai pengurusan setiap PPR tersebut untuk dihubungi

4. Saya amat berbesar hati sekiranya pihak tuan dapat memberikan keizinan untuk mendapatkan maklumat tersebut. Saya juga ingin memohon kebenaran dan kerjasama pihak tuan agar pelajar tersebut dapat menjalankan kajian beliau. Sekiranya terdapat pertanyaan atau perlu maklumat lanjut, sila hubungi saya di talian 03-89472481 atau Nurul Izzati binti Mohd Suffian di talian 017-3821050. Segala kerjasama daripada pihak tuan didahului dengan ucapan terima kasih.

'BERILMU BERBAKTI'

Yang benar,


DR. SITI NUR 'ASYURA BT ADZNAM
Penyelia projek
Jabatan Pemakanan dan Dietetik
Fakulti Perubatan dan Sains Kesihatan
Universiti Putra Malaysia

s.k -Penyelidik, Nurul Izzati binti Mohd Suffian (GS54397)

☒ Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor Darul Ehsan, Malaysia.
☎ 603-8947 2300 ☎ 603-8947 2585 ☎ <http://www.upm.edu.my>

Scanned by CamScanner

APPENDIX II

Approval letter from DBKL



ديوان بندر كوالالمپور
DEWAN BANDARAYA KUALA LUMPUR
JABATAN PEMBANGUNAN KOMUNITI DAN KESEJAHTERAAN BANDAR
TINGKAT 4 - 9, 12 & 18
MENARA DBKL 3, BANDAR WAWASAN
JALAN RAJA ABDULLAH
50350 KUALA LUMPUR



Rujukan Tuan :
Rujukan Kami : (23) DBKL/JPKKB/PTD/1/7-11.1
Tarikh : 1 0 JUN 2019

Dr. Siti Nur 'Asyura bt Adznam
Penyelia Projek
Jabatan Pemakanan dan Dietetik
Fakulti Perubatan dan Sains Kesihatan
Universiti Putra Malaysia
43400 UPM Serdang
Selangor Darul Ehsan

Puan,

KEBENARAN MEMBUAT KAJIAN DAN MENDAPATKAN MAKLUMAT

Dengan hormatnya saya diarah merujuk perkara tersebut di atas dan surat puan bertarikh 28 Mac 2019 adalah berkaitan.

2. Dimaklumkan bahawa Jabatan Pembangunan Komuniti dan Kesejahteraan Bandar, Dewan Bandaraya Kuala Lumpur tiada halangan untuk membenarkan Cik Nurul Izzati binti Mohd Suffian (No. Matrik : GS54397) pelajar puan membuat kajian dan mendapatkan maklumat berkaitan bagi memenuhi keperluan tesis yang bertajuk "*Penilaian tahap penerimaan bahan pendidikan dan tahap pelaksanaan modul intervensi frailty dalam kalangan warga tua di flat PPR Kuala Lumpur*". Bersama-sama ini juga disertakan senarai Perumahan Awam dan PPR di sekitar Kuala Lumpur seperti yang diminta untuk makluman dan tindakan pihak puan selanjutnya.

Sekian dimaklumkan, terima kasih.

"BERKHIDMAT UNTUK NEGARA"
"BERSEEDIA MENYUMBANG, BANDAR RAYA CEMERLANG"

Saya yang menjalankan amanah,


(THANESH A/L BALAKRISHNA)
Jabatan Pembangunan Komuniti Dan Kesejahteraan Bandar
b.p. Datuk Bandar Kuala Lumpur

..2/-



APPENDIX III

Approval letter from JKEUPM

Ref. no: UPM/TNCPI/RMC/JKEUPM/1.4.18.2 (JKEUPM)

Date: 12 February 2020

Dear Prof./Dr./Mr./Ms.,

APPLICATION FOR JKEUPM ETHICAL CLEARANCE: APPROVED

With reference to the above, I am pleased to inform you that your application for ethical clearance for the research project entitled 'Nutrition education and exercise intervention in preventing frailty among pre-frail Malaysian elderly in PPR flats Kuala Lumpur' has been approved.

Please note that the official letter of approval will be issued as soon as possible. However, the ethical clearance is considered effective from the date of this email, and you may now proceed with your research.

Kindly remind the ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.

Researchers should also complete a Study Final Report upon study completion. The form can be obtained from the Ethics Committee for Research Involving Human Subjects (JKEUPM) website (<http://www.tncpi.upm.edu.my/faildokumen>).

If you have any enquiries, please contact Ms. Nurulhasanah Ishak (03-97691605) or Ms. Nor Ellia Abd Ajis (03-97691244).

Note: Please use this reference number for any transaction:- JKEUPM-2019-335

Thank you.

Yours faithfully,

Prof. Dr. Zamberi Sekawi
Chair
Ethics Committee for Research Involving Human Subjects
Universiti Putra Malaysia

APPENDIX IV

Research consent to PPR Batu Muda



UPM
UNIVERSITI PUTRA MALAYSIA

FAKULTI PERUBATAN DAN SAINS KESIHATAN

Faculty of Medicine and Health Sciences

Tarikh 14 Feb 2020

Pengerusi
PPR Batu Muda,
51200 Kuala Lumpur,
W.P. Kuala Lumpur.

(UP: Encik Redzuan bin Hanafi)

Tuan/Puan,

MEMOHON KEBENARAN MENJALANKAN PENYELIDIKAN PROJEK ILMIAH TAHUN AKHIR (PKK4999) DALAM KALANGAN WARGA EMAS DI PPR BATU MUDA

Dengan segala hormatnya perkara di atas di rujuk.

2. Dua orang pelajar tahun akhir Bachelor Sains (Pemakanan dan Kesihatan Komuniti) dari Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan, UPM bercadang untuk menjalankan kajian dalam penduduk PPR Batu Muda yang berusia 60 tahun ke atas sebagai syarat untuk lulus dalam kursus ini. Berikut ialah nama pelajar dan tajuk kajian yang dicadangkan:

Nama pelajar : i) Nur Najatul Munirah binti Muhamad Bokery (No Matrik: 187525)
ii) Wan Hyssna binti Wan Omar (No Matrik: 190505)

Tajuk Kajian : Perubahan status keuzuran selepas setahun kajian susulan & faktor-faktor berkaitan dengan sarkopenia dalam kalangan warga emas di PPR Kuala Lumpur.

3. Program ini diadakan bertujuan untuk:

- i. Mengadakan kajian susulan selepas setahun berkenaan dengan tahap kesihatan dan kualiti hidup terhadap responden tahun lalu.
- ii. Meningkatkan pengetahuan dan kesedaran tentang kepentingan gaya hidup sihat melalui pemakanan dan aktiviti fizikal dalam kalangan penduduk PPR Batu Muda.

4. Untuk makluman tuan/puan, program tersebut akan diadakan pada:

Tempoh Tarikh : 1 Mac 2020

Masa : 8.00 pagi - 12.30 tengahari

APPENDIX V

Research paper work PPR Batu Muda

1.0 PENGENALAN

Keuzuran dan sarkopenia (kehilangan jisim otot) adalah perkara lazim yang akan dihadapi dalam kalangan warga emas. Kajian terdahulu menyatakan bahawa dua faktor ini mempengaruhi dan memberi impak yang negatif terhadap kesihatan dalam kalangan warga emas. Perkara ini juga semakin meningkat dalam kalangan komuniti warga emas tidak kira di bandar mahupun di luar bandar. Pada program kesihatan tahun lalu juga, dapat dilihat status keuzuran dalam kalangan warga emas boleh dikatakan tinggi (Lampiran 2). Oleh yang demikian, kajian ini bertujuan untuk melihat perubahan status keuzuran selepas setahun susulan. Program ini juga melihat faktor-faktor yang berkaitan dengan sarkopenia dari segi sosio-demografi, komposisi badan, sejarah pemakanan, aktiviti fizikal dan status fungsian bagi penduduk warga emas yang berumur 60 tahun ke atas di PPR Kuala Lumpur.

Kajian ini adalah sebahagian daripada keperluan untuk bergraduat bagi pelajar tahun akhir program Bachelior Sains (Pemakanan dan Kesihatan Komuniti) dari Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia (UPM). Kajian ini telah mendapat kelulusan daripada pihak Jawatan Kuasa Etika Penyelidikan UPM.

Sarapan dan hadian akan diberikan kepada setiap peserta sebagai landa penghargaan kami terhadap mereka atas penglibatan mereka secara langsung dalam kaji selidik ini.



KERTAS KERJA

PROJEK KAJIAN ILMIAH TAHUN AKHIR:

PERUBAHAN STATUS KEUZURAN SELEPAS SETAHUN KAJIAN SUSULAN & FAKTOR-FAKTOR BERTKAITAN DENGAN SARKOPENIA DALAM KALANGAN WARGA EMAS DI KUALA LUMPUR

TARIKH

1 MAC 2020

TEMPAT

PPR BATU MUDA, KUALA LUMPUR

ANJURAN

PELAJAR TAHUN AKHIR

BACHELOR SAINS (PEMAKANAN DAN KESIHATAN KOMUNITI)

Wan Hyssna binti Wan Omar (No Matrik: 190505)

Nur Najatul Munirah binti Muhamad Bokery (No Matrik: 187525)

DENGAN KERJASAMA

JABATAN PEMAKANAN DAN DIETETIK, FAKULTI PERUBATAN DAN SAINS KESIHATAN (FPSK), UNIVERSITI PUTRA MALAYSIA

2.0 OBJEKTIF

- i. Mendapatkan kelulusan dan sokongan daripada Encik Redzuan bin Hanafi, Pengerusi Persatuan Penduduk PPR Batu Muda dan staf-staf pengurusan Ahli Jawatan Kuasa (AJK) Persatuan Penduduk PPR Batu Muda untuk mengadakan Program Kesihatan Komuniti anjuran pelajar Projek Ilmiah Tahun Akhir (PKK4999), Ijazah Sarjana Muda (Sains) Pemakanan dan Kesihatan Komuniti, Universiti Putra Malaysia.
- ii. Menganalisa perubahan status keuzuran selepas setahun kajian susulan dan faktor - faktor yang berkaitan dengan sarkopenia dalam kalangan warga emas di PPR Kuala Lumpur terutama PPR Batu Muda.
- iii. Mengadakan kajian susulan terhadap peserta yang terlibat dalam program kesihatan komuniti anjuran Universiti Putra Malaysia pada tahun lalu (rujuk Lampiran 1) dalam usaha untuk menganalisa perubahan status keuzuran selepas setahun kajian susulan.
- iv. Menggalakan lebih ramai peserta baru yang berusia 60 tahun dan ke atas untuk menyertai dan terlibat dalam kaji selidik ini.
- v. Meningkatkan pengetahuan dan kesedaran tentang kepentingan gaya hidup sihat melalui pemakanan dan aktiviti fizikal dalam kalangan penduduk warga emas PPR Batu Muda
- vi. Menantapkan hubungan dua hala antara Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan Universiti Putra Malaysia dan PPR Batu Muda

3.0 HASIL PEMBELAJARAN

- i. Memberi keputusan akhir mengenai status kesihatan warga emas di PPR Batu Muda.
- ii. Mewujudkan dan menanam nilai kepimpinan dalam kalangan pelajar Tahun Akhir Ijazah Sarjana Muda (Sains) Pemakanan dan Kesihatan Komuniti, Universiti Putra Malaysia terutama untuk melaksanakan kursus Projek Ilmiah Tahun Akhir (PKK4999).

- iii. Melatih pelajar Projek Ilmiah Tahun Akhir untuk berkomunikasi dengan penuh yakin, jelas melontarkan pandangan dan bijak dalam bekerjasama dengan pihak luar.
- iv. Peserta dapat mengetahui status kesihatan mereka.
- v. Hadiah akan diberikan kepada setiap peserta yang hadir melibatkan diri dalam kaji selidik ini.

4.0 IMPAK PROGRAM

- i. Para pelajar Projek Ilmiah Tahun Akhir (PKK4999) dapat mempertingkatkan nilai kepimpinan dalam diri terutamanya semasa mengendalikan program dan bekerjasama dengan pihak pengurusan.
- ii. Dapat membentuk pelajar Projek Ilmiah Tahun Akhir (PKK4999) yang holistik bukan sahaja pintar dan segi akademik malah berbakat dalam pelbagai bidang.
- iii. Dapat mengekalkan hubungan dua hala antara Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan Universiti Putra Malaysia dan PPR Batu Muda.

5.0 TARIKH

1 Mac 2020 (Ahad)

6.0 TEMPAT

PPR Batu Muda, Kuala Lumpur

7.0 ANJURAN

Pelajar Tahun Akhir, Baccelor Sains (Pemakanan dan Kesihatan Komuniti) Universiti Putra Malaysia dengan kerjasama Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia.

LAMPIRAN 1
SENARAI PESERTA YANG TERLIBAT DENGAN PROGRAM KESIHATAN DI PPR BATU
MUDA PADA TAHUN LALU

NO	NAMA PESERTA	NO TEL
1	Habsah bt Abdullah	017-3170381
2	Rokiah bt Simin	017-7682942
3	Sariah bt Hashim	017-3042975
4	Raunah bt Salleh	010-5634903
5	Jamaliah bt Mustajab	011-62237223
6	Fatimah bt Salleh	011-51173173
7	Sharifah bt Dahari	017-3508353
8	Shuhadin bin Mat Jail	019-6013354
9	Samsiah bt Mat Hassan	011-3960786
10	Md Zain bin Hassan	012-3768664
11	Bunga bt Din	012-3768664
12	Rahmah bt Yot	017-2353794
13	Samsiah bt Ahamad	012-6056965
14	Hajah Embun bt Jafar	012-6056965
15	Mohd Sidek bin Sukimon	019-6089382
16	Muhammad bin Idris	012-3551922
17	Meriam bt Samsuddin	017-3718495
18	Maimunah bt Shaari	012-9142801
19	Kamsiah bt Hassan	011-14367960
20	Sa'aniah bt Mohd Som	017-3505263

21	Rosnani bt Othman	017-6511027
22	Selvanaige	016-3130850
23	Musa bin Ismail	019-3810737
24	Rohanah bt Hashim	012-2949616
25	Hajah Hafsa	016-3610260
26	Bahrum bin Bidin	012-3365672
27	Kamalam A/P Murugan	
28	Seethaleichumee A/P Kothandapani	
29	Lela bt Kassim	017-6218076

LAMPIRAN 2

KEPUTUSAN KESELURUHAN STATUS KESIHATAN WARGA EMAS PPR KUALA LUMPUR PADA TAHUN LALU

i. Kelaziman sindrom keuzuran mengikut jantina :

Status Sindrom Keuzuran	Jumlah (n = 301)	Lelaki (n = 92)	Perempuan (n = 209)
Normal	34 (11.3%)	15 (16.3%)	19 (9.1%)
Pra - keuzuran	219 (72.8%)	66 (71.7%)	153 (73.2%)
Uzur	48 (15.9%)	11 (12.0%)	37 (17.7%)

(Camilla Wahida et al., 2019)

ii. Pembahagian sindrom keuzuran mengikut ciri-ciri fenotip :

Ciri - ciri fenotip	Jumlah	Lelaki	Perempuan
Penyusutan berat badan	37 (12.3%)	17 (45.9%)	20 (54.1%)
Kelenahan	239 (79.4%)	63 (26.4%)	176 (73.6%)
Kelelahan	61 (20.3%)	10 (16.4%)	51 (83.6%)
Kelambatan	81 (26.9%)	21 (25.9%)	60 (74.1%)
Kekurangan aktiviti fizikal	58 (19.3%)	19 (32.8%)	39 (67.2%)

(Camilla Wahida et al., 2019)

LAMPIRAN 3

AHLI JAWATAN KUASA PELAKSANA PROGRAM KESIHATAN KOMUNITI

JAWATAN	NAMA	NO. TELEFON
PERSON IN CHARGE	Wan Hyssna binti Wan Omar	013-3959237
	Nur Najatul Munirah binti Muhammad Bokery	018-3187874
	Camilla Wahida binti Norazman	018-7713642
	Nurul Izzati	017-3821050
AHLI JAWATANKUASA	Siti Nur Amirah binti Mohd Adnan	019-8395319
	Mohamad Aiman bin Kamarol Azizi	017-5974927

LAMPIRAN 4

TENTATIF PROGRAM

LAMPIRAN 5

LOGISTIK YANG DIPERLUKAN

BARANG - BARANG PPR	KUANTITI	KELUAR	MASUK
Kerusi	50		
Meja	10		
Mikrofon	1		
Speaker	1		
Plug	1		

7.00 AM	Set up tempat
7.30 AM	Kelbaan peserta
8.00 AM	Perasmian majlis oleh Wakil Penduduk
8.15 AM	Taklimat ringkas akan diberikan oleh pihak UPM
8.20 AM	Sarapan untuk wakil penduduk dan peserta
8.30 AM – 12 PM	• Peserta mendaftar di meja pendaftaran (STESSEN 1) dan perlu menunjukkan kad pengenalan kepada PIC • PIC mencatat nombor kad pengenalan dan nombor badan peserta • Bahagian A, B, C, D dan Ujian Jamar Handgrip akan dibacakan oleh PIC kepada responden di STESSEN 1 • Setelah selesai, PIC akan menanda tangan di "Checklist Checklist" • PIC akan mengarahkan peserta untuk pergi ke stesen-stesen yang kosong. • PIC stesen tersebut akan menandatangani "Checklist Checklist" apabila tamat mengambil data • Apabila peserta telah selesai disemua stesen, peserta perlu memberi borang kaji selidik di STESSEN 1 dan cenderahati akan diberikan
12 PM	Ucapan penutupan oleh wakil penduduk
12.15 PM	Makan tengahari

APPENDIX VI

Research consent to PPR Seri Semarak 2



FAKULTI PERUBATAN DAN SAINS KESIHATAN

Faculty of Medicine and Health Sciences

Tarikh : 20 Feb 2020

Pengerusi
Persatuan Penduduk PPR Seri Semarak,
53300 Kuala Lumpur,
W.P. Kuala Lumpur.

(UP: ENCIK HAFIZ)

Tuan/Puan,

MEMOHON KEBENARAN MENJALANKAN PENYELIDIKAN PROJEK ILMIAH TAHUN AKHIR (PKK4999) DALAM KALANGAN WARGA EMAS DI PPR SERI SEMARAK

Dengan segala hormatnya perkara di atas di rujuk.

2. Dua orang pelajar tahun akhir Bachelor Sains (Pemakanan dan Kesihatan Komuniti) dari Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan, UPM bercadang untuk menjalankan kajian dalam penduduk PPR Seri Semarak yang berusia 60 tahun ke atas sebagai syarat untuk lulus dalam kursus ini. Berikut ialah nama pelajar dan tajuk kajian yang dicadangkan:

Nama pelajar : i) Nur Najatul Munirah binti Muhamad Bokery (No Matrik: 187525)
ii) Wan Hyssna binti Wan Omar (No Matrik: 190505)

Tajuk Kajian : Perubahan status keuzuran selepas setahun kajian susulan & faktor-faktor berkaitan dengan sarkopenia dalam kalangan warga emas di PPR Kuala Lumpur.

3. Program ini diadakan bertujuan untuk:

- i. Mengadakan kajian susulan selepas setahun berkenaan dengan tahap kesihatan dan kualiti hidup terhadap responden tahun lalu.
- ii. Meningkatkan pengetahuan dan kesedaran tentang kepentingan gaya hidup sihat melalui pemakanan dan aktiviti fizikal dalam kalangan penduduk PPR Seri Semarak.

APPENDIX VII

Research paper work PPR Seri Semarak 2

1.0 PENGENALAN

Keuzuran dan sarkopenia (kehilangan jisim otot) adalah perkara lazim yang akan dihadapi dalam kalangan warga emas. Kajian terdahulu menyatakan bahawa dua faktor ini mempengaruhi dan memberi impak yang negatif terhadap kesihatan dalam kalangan warga emas. Perkara ini juga semakin meningkat dalam kalangan komuniti warga emas tidak kira di bandar mahupun di luar bandar. Pada program kesihatan tahun lalu juga, dapat dilihat status keuzuran dalam kalangan warga emas boleh dikatakan tinggi (Lampiran 2). Oleh yang demikian, kajian ini bertujuan untuk melihat perubahan status keuzuran selepas setahun kajian susulan. Program ini juga melihat faktor-faktor yang berkaitan dengan sarkopenia dari segi sosio-demografi, komposisi badan, sejarah pemakanan, aktiviti fizikal dan status fungsian bagi penduduk warga emas yang berumur 60 tahun ke atas di PPR Kuala Lumpur.

Kajian ini adalah sebahagian daripada keperluan untuk bergraduat bagi pelajar tahun akhir program Bachelor Sains (Pemakanan dan Kesihatan Komuniti) dari Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia (UPM). Kajian ini telah mendapat kelulusan daripada pihak Jawatan Kuasa Etika Penyelidikan UPM.

Sarapan dan hadiah akan diberikan kepada setiap peserta sebagai tanda penghargaan kami terhadap mereka atas penglibatan mereka secara langsung dalam kaji selidik ini.



KERTAS KERJA

PROJEK KAJIAN ILMIAH TAHUN AKHIR:

PERUBAHAN STATUS KEUZURAN SELEPAS SETAHUN KAJIAN SUSULAN &
FAKTOR-FAKTOR BERKAITAN DENGAN SARKOPENIA DALAM KALANGAN
WARGA EMAS DI KUALA LUMPUR

TARIKH

8 MAC 2020

TEMPAT

PPR SERI SEMARAK, KUALA LUMPUR

ANJURAN

PELAJAR TAHUN AKHIR

BACELOS SAINS (PEMAKANAN DAN KESIHATAN KOMUNITI)

Nur Najatul Munirah binti Muhamad Bokery (No Matrik: 187525)

Wan Hyssna binti Wan Omar (No Matrik: 190505)

DENGAN KERJASAMA

JABATAN PEMAKANAN DAN DIETETIK, FAKULTI PERUBATAN DAN SAINS
KESIHATAN (FPSK), UNIVERSITI PUTRA MALAYSIA

2.0 OBJEKTIF

- Mendapatkan kelulusan dan sokongan daripada Pengerusi Persatuan Penduduk PPR Seri Semarak dan staf-staf pengurusan Ahi Jawatan Kuasa (AJK) Persatuan Penduduk PPR Seri Semarak untuk mengadakan Program Kesihatan Komuniti anjuran pelajar Projek Ilmiah Tahun Akhir (PKK4999), Ijazah Sarjana Muda (Sains) Pemakanan dan Kesihatan Komuniti, Universiti Putra Malaysia.
- Menganalisa perubahan status keuzuran selepas setahun kajian susulan dan faktor - faktor yang berkaitan dengan sarkopenia dalam kalangan warga emas di PPR Kuala Lumpur terutama PPR Seri Semarak.
- Mengadakan kajian susulan terhadap peserta yang terlibat dalam program kesihatan komuniti anjuran Universiti Putra Malaysia pada tahun lalu (rujuk Lampiran 1) dalam usaha untuk menganalisa perubahan status keuzuran selepas setahun kajian susulan.
- Meningkatkan pengetahuan dan kesedaran tentang kepentingan gaya hidup sihat melalui pemakanan dan aktiviti fizikal dalam kalangan penduduk warga emas PPR Seri Semarak.
- Memantapkan hubungan dua hala antara Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan Universiti Putra Malaysia dan PPR Seri Semarak.

3.0 HASIL PEMBELAJARAN

- Memberi keputusan akhir mengenai status kesihatan warga emas di PPR Seri Semarak.
- Mewujudkan dan menanam nilai kepimpinan dalam kalangan pelajar Tahun Akhir Ijazah Sarjana Muda (Sains) Pemakanan dan Kesihatan Komuniti, Universiti Putra Malaysia terutama untuk melaksanakan kursus Projek Ilmiah Tahun Akhir (PKK4999).

3

- Melatih pelajar Projek Ilmiah Tahun Akhir untuk berkomunikasi dengan penuh yakin, jelas melontarkan pandangan dan bijak dalam bekerjasama dengan pihak luar.
- Peserta dapat mengetahui status kesihatan mereka.
- Hadiah akan diberikan kepada setiap peserta yang hadir melibatkan diri dalam kaji selidik ini.

4.0 IMPAK PROGRAM

- Para pelajar Projek Ilmiah Tahun Akhir (PKK4999) dapat mempertingkatkan nilai kepimpinan dalam diri terutamanya semasa mengendalikan program dan bekerjasama dengan pihak pengurusan.
- Dapat membentuk pelajar Projek Ilmiah Tahun Akhir (PKK4999) yang holistik bukan sahaja pintar dari segi akademik malah berbakat dalam pelbagai bidang.
- Dapat mengekalkan hubungan dua hala antara Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan Universiti Putra Malaysia dan PPR Seri Semarak.

5.0 TARIKH DAN TEMPAT

Program ini akan dijalankan pada 8 Mac 2020.

6.0 TEMPAT

PPR Seri Semarak, Kuala Lumpur.

7.0 ANJURAN

Pelajar Tahun Akhir, Baccelor Sains (Pemakanan dan Kesihatan Komuniti) Universiti Putra Malaysia dengan kerjasama Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia.

4

LAMPIRAN 1
SENARAI PESERTA YANG TERLIBAT DENGAN PROGRAM KESIHATAN DI PPR SERI
SEMARAK PADA TAHUN LALU

NAMA	NO TELEFON
AHMAD BIN BACHIK	0362533835
KAL TOM BT SERO	0122305858
ROSMINAH @ ROSNI BT SHUKRI	0123661249
SAMSI AH BINTI SAMSULI	0169180857
SUCELA A/P MARIMUTHU	016-2697864
HADI AH BINTI SAID	0173279284
RUSLAN BIN KOLAN	0166715568
JAWI BT HUSSIN	0173094625
TAJUDDIN ARIFFIN B CHE MAT DIN	0123573586
MARSUAH BT MAHYUNI	
ABU BAKAR BIN BABA	0133991207
CHOONG NYOK MENG	0169079388
RUTIAH @ SALABIAH BT TUAN @ IAJB	01111906168
HAZIZAH @ AZIZAH BT MOHAMED	0124912247
SUMIATI BT AHMAD	0193914050
ABDUL QADRI B ABDUL RANI	0172013009
OTHMAN BIN BABA	0173816342
HAMISAH BT BAKAR	0122854653
HAMIDAH BEE BT ABD HAMID	
MOHD RAMLI BIN JAAMAT	01128564223

LAMPIRAN 2

KEPUTUSAN KESELURUHAN STATUS KESIHATAN WARGA EMAS PPR KUALA
LUMPUR PADA TAHUN LALU

i. Kelaziman sindrom keuzuran mengikut jantina :

Status Sindrom Keuzuran	Jumlah (n = 301)	Lelaki (n = 92)	Perempuan (n = 209)
Normal	34 (11.3%)	15 (16.3%)	19 (9.1%)
Pra - keuzuran	219 (72.8%)	66 (71.7%)	153 (73.2%)
Uzur	48 (15.9%)	11 (12.0%)	37 (17.7%)

(Camilla Wahida et al., 2019)

ii. Pembahagian sindrom keuzuran mengikut ciri-ciri fenotip :

Ciri - ciri fenotip	Jumlah	Lelaki	Perempuan
Penyusutan berat badan	37 (12.3%)	17 (45.9%)	20 (54.1%)
Kelemahan	239 (79.4%)	63 (26.4%)	176 (73.6%)
Kelelahan	61 (20.3%)	10 (16.4%)	51 (83.6%)
Kelambatan	81 (26.9%)	21 (25.9%)	60 (74.1%)
Kekurangan aktiviti fizikal	58 (19.3%)	19 (32.8%)	39 (67.2%)

(Camilla Wahida et al., 2019)

LAMPIRAN 3

**AHLI JAWATAN KUASA PELAKSANA
PROGRAM KESIHATAN KOMUNITI**

JAWATAN	NAMA	NO. TELEFON
PERSON IN CHARGE (siapa yg pgg ppt tu syna/neja)	Nur Najatul Munirah binti Muhamad Bokery	018-3187874
AHLI JAWATAN KUASA	Wan Hyssna binti Wan Omar	013-3959237
	Camilla Wahida binti Norazman	018-7713642
	Nurul Izzati	017-3821050
	Siti Nur Amirah binti Mohd Adnan	019-9395319
	Mohamad Aiman bin Kamarol Azizi	017-5974927

LAMPIRAN 4

TENTATIF PROGRAM

7.00 AM	Set up tempat
7.30 AM	Ketibaan peserta
8.00 AM	Perasmian majlis oleh Wakil Penduduk
8.15 AM	Taklimat ringkas akan diberikan oleh pihak UPM
8.20 AM	Sarapan untuk wakil penduduk dan peserta
8.30 AM – 12 PM	• Peserta mendaftar di meja pendaftaran (STESEN 1) dan perlu menunjukkan kad pengenalan kepada PIC • PIC mencatat nombor kad pengenalan dan nombor badan peserta • Bahagian A, B, C, D dan Ujian Jamar Handgrip akan dibacakan oleh PIC kepada responden di STESEN 1 • Setelah selesai, PIC akan menanda tangan di "Checklist Checklist" • PIC akan mengarahkan peserta untuk pergi ke stesen-stesen yang kosong. • PIC stesen tersebut akan menandatangani "Checklist Checklist" apabila tamat mengambil data • Apabila peserta telah selesai disemua stesen, peserta perlu memberi borang kaji selidik di STESEN 1 dan cenderahati akan diberikan
12 PM	Ucapan penutupan oleh wakil penduduk
12.15 PM	Makan tengahari

LOGISTIK YANG DIPERLUKAN

BARANG- BARANG PPR	KUANTITI	KELUAR	MASUK
Kerusi	50		
Meja	10		
Mikrofon	1		
Speaker	1		
Plug	1		

APPENDIX VIII

Research consent to PPR Kg. Muhibbah

Tarikh : 14 Feb 2020

Pengerusi
PPR Kampung Muhibbah,
58200 Kuala Lumpur,
W.P. Kuala Lumpur.

(UP: Ybhg Dato' Hj Nik Mohd Kamil bin Hj Nik Daud)

Tuan/Puan,

MEMOHON KEBENARAN MENJALANKAN PENYELIDIKAN PROJEK ILMIAH TAHUN AKHIR (PKK4999) DALAM KALANGAN WARGA EMAS DI PPR KAMPUNG MUHIBBAH.

Dengan segala hormatnya perkara di atas di rujuk.

2. Dua orang pelajar tahun akhir Bachelo Sains (Pemakanan dan Kesihatan Komuniti) dari Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan, UPM bercadang untuk menjalankan kajian dalam penduduk PPR Kampung Muhibbah yang berusia 60 tahun ke atas sebagai syarat untuk lulus dalam kursus ini. Berikut ialah nama pelajar dan tajuk kajian yang dicadangkan:

Nama pelajar : i) Nur Najatul Munirah binti Muhamad Bokery (No Matrik: 187525)
ii) Wan Hyssna binti Wan Omar (No Matrik: 190505)

Tajuk Kajian : Perubahan status keuzuran selepas setahun kajian susulan & faktor-faktor berkaitan dengan sarkopenia dalam kalangan warga emas di PPR Kuala Lumpur.

3. Program ini diadakan bertujuan untuk:

- i. Mengadakan kajian susulan selepas setahun berkenaan dengan tahap kesihatan dan kualiti hidup terhadap responden tahun lalu.
- ii. Meningkatkan pengetahuan dan kesedaran tentang kepentingan gaya hidup sihat melalui pemakanan dan aktiviti fizikal dalam kalangan penduduk PPR Kampung Muhibbah.

4. Untuk makluman tuan/puan, program tersebut akan diadakan pada:

Tempoh Tarikh : 10 Mac 2020
Masa : 8.00 pagi - 12.30 tengahari

APPENDIX IX

Research paper work PPR Kg Muhibbah

1.0 PENGENALAN

Keuzuran dan sarkopenia (kehilangan jisim otot) adalah perkara lazim yang akan dihadapi dalam kalangan warga emas. Kajian terdahulu menyatakan bahawa dua faktor ini mempengaruhi dan memberi impak yang negatif terhadap kesihatan dalam kalangan warga emas. Perkara ini juga semakin meningkat dalam kalangan komuniti warga emas tidak kira di bandar mahupun di luar bandar. Pada program kesihatan tahun lalu juga, dapat dilihat status keuzuran dalam kalangan warga emas boleh dikatakan tinggi (Lampiran 2). Oleh yang demikian, kajian ini bertujuan untuk melihat perubahan status keuzuran selepas setahun susulan. Program ini juga melihat faktor-faktor yang berkaitan dengan sarkopenia dari segi sosio-demografi, komposisi badan, sejarah pemakanan, aktiviti fizikal dan status fungsian bagi penduduk warga emas yang berumur 60 tahun ke atas di PPR Kuala Lumpur.

Kajian ini adalah sebahagian daripada keperluan untuk bergraduat bagi pelajar tahun akhir program Bachelior Sains (Pemakanan dan Kesihatan Komuniti) dari Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia (UPM). Kajian ini telah mendapat kelulusan daripada pihak Jawatan Kuasa Etika Penyelidikan UPM.

Sarapan dan hadiah akan diberikan kepada setiap peserta sebagai tanda penghargaan kami terhadap mereka atas penglibatan mereka secara langsung dalam kajian selidik ini.



KERTAS KERJA

PROJEK KAJIAN ILMIAH TAHUN AKHIR:

PERUBAHAN STATUS KEUZURAN SELEPAS SETAHUN KAJIAN SUSULAN & FAKTOR-FAKTOR BERKAITAN DENGAN SARKOPENIA DALAM KALANGAN WARGA EMAS DI PPR KUALA LUMPUR

TARIKH

21 MAC 2020

TEMPAT

PPR HILIRAN AMPANG, WILAYAH PERSEKUTUAN KUALA LUMPUR

ANJURAN

PELAJAR TAHUN AKHIR

BACHELOR SAINS (PEMAKANAN DAN KESIHATAN KOMUNITI)

Wan Hyssna binti Wan Omar (No Matrik: 190505)

Nur Najatul Munirah binti Muhammad Bokery (No Matrik: 187525)

DENGAN KERJASAMA

JABATAN PEMAKANAN DAN DIETETIK, FAKULTI PERUBATAN DAN SAINS KESIHATAN (FPSK), UNIVERSITI PUTRA MALAYSIA

2.0 OBJEKTIF

- i. Mendapatkan kelulusan dan sokongan daripada Encik Hj. Ramlee bin Alias, Pengerusi Persatuan Penduduk PPR Hiliran Ampang dan staf-staf pengurusan Ahli Jawatan Kuasa (AJK) Persatuan Penduduk PPR Hiliran Ampang untuk mengadakan Program Kesihatan Komuniti anjuran pelajar Projek Ilmiah Tahun Akhir (PKK4999), Ijazah Sarjana Muda (Sains) Pemakanan dan Kesihatan Komuniti, Universiti Putra Malaysia.
- ii. Menganalisa perubahan status keuzuran selepas setahun kajian susulan dan faktor - faktor yang berkaitan dengan sarkopenia dalam kalangan warga emas di PPR Kuala Lumpur terutama PPR Hiliran Ampang.
- iii. Mengadakan kajian susulan terhadap peserta yang terlibat dalam program kesihatan komuniti anjuran Universiti Putra Malaysia pada tahun lalu (rujuk Lampiran 1) dalam usaha untuk menganalisa perubahan status keuzuran selepas setahun kajian susulan.
- iv. Menggalakan lebih ramai peserta baru yang berusia 60 tahun dan ke atas untuk menyertai dan terlibat dalam kaji selidik ini.
- v. Meningkatkan pengetahuan dan kesedaran tentang kepentingan gaya hidup sihat melalui pemakanan dan aktiviti fizikal dalam kalangan penduduk warga emas PPR Hiliran Ampang
- vi. Memantapkan hubungan dua hala antara Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan Universiti Putra Malaysia dan PPR Hiliran Ampang.

3.0 HASIL PEMBELAJARAN

- i. Memberi keputusan akhir mengenai status kesihatan warga emas di PPR Hiliran Ampang.
- ii. Mewujudkan dan menanam nilai kepimpinan dalam kalangan pelajar Tahun Akhir Ijazah Sarjana Muda (Sains) Pemakanan dan Kesihatan Komuniti, Universiti Putra Malaysia terutama untuk melaksanakan kursus Projek Ilmiah Tahun Akhir (PKK4999).

3

- iii. Melatih pelajar Projek Ilmiah Tahun Akhir untuk berkomunikasi dengan penuh yakin, jelas melontarkan pandangan dan bijak dalam bekerjasama dengan pihak luar.
- iv. Peserta dapat mengetahui status kesihatan mereka.
- v. Hadiah akan diberikan kepada setiap peserta yang hadir melibatkan diri dalam kaji selidik ini.

4.0 IMPAK PROGRAM

- i. Para pelajar Projek Ilmiah Tahun Akhir (PKK4999) dapat meningkatkan nilai kepimpinan dalam diri terutamanya semasa mengendalikan program dan bekerjasama dengan pihak pengurusan.
- ii. Dapat membentuk pelajar Projek Ilmiah Tahun Akhir (PKK4999) yang holistik bukan sahaja pintar dari segi akademik malah berbakat dalam pelbagai bidang.
- iii. Dapat mengekalkan hubungan dua hala antara Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan Universiti Putra Malaysia dan PPR Hiliran Ampang.

5.0 TARIKH

21 Mac 2020 (Sabtu)

6.0 TEMPAT

PPR Hiliran Ampang, Kuala Lumpur.

7.0 ANJURAN

Pelajar Tahun Akhir, Bachelior Sains (Pemakanan dan Kesihatan Komuniti) Universiti Putra Malaysia dengan kerjasama Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia.

4

LAMPIRAN 1
SENARAI PESERTA YANG TERLIBAT DENGAN PROGRAM KESIHATAN DI PPR HILIRAN
AMPANG PADA TAHUN LALU

NO	NAMA PESERTA	NO TEL
1	Mohd Roslan bin Abd Rashid	018-3947882
2	Rusnani bt Ariffin	019-2208326
3	Ainah bt Aghat	012-3685184
4	Roslan bin Md Sah	017-2914560
5	Khamsani bin Ab Kadir	012-6529859
6	Surati binti Abdullah	017-3299960
7	Chin Sool Cheng@Yusof bin Sunar	017-2842959
8	Zainon bin Hashim	014-2383450
9	Embon bt Mat Ali	
10	Halizah bt Yakub	017-3048202
11	Abdul Moaid bin Abd Hamid	013-3387923
12	Satariah bt Saad	019-5968008
13	Yusof bin Ahmad	016-2133534
14	Mohd Yusof bin Ali	016-2961265
15	Khalid bin Ali	013-3218587
16	Hajimah bt Saad	012-6386980
17	Siti Aminah bt Md Rani	03-62506270
18	Yusof bin Kusni	017-2645322
19	Mohd Yusof bin Othman	
20	Robiah bt Chik	011-21259441

7

21	Muhalzan bt Moin	019-4596049
22	Sapiah bt Mar'atop	017-8866055
23	Thaliahah binti Sulaiman	011-31544589
24	Norisene bt Jamary	012-6284763
25	Othman bin Jaafar	016-9540549
26	Hashim bt Ibrahim	012-6916279
27	Marsu @ Marsut bin Rapa	
28	Leha bt Ujang	012-2428947
29	Fuziah bt Omar	018-2660937
30	Saleha binti Ahmad	011-2392719
31	Abd Hamid bin Dollah	017-8866079
32	Sitani binti Mat Sap	
33	Sariah binti Yaacob	
34	Kasidah bt Haji Mohamad	017-2048252
35	Abdul Hamid bin Wahab	016-69525888
36	Einon binti Hassan	013-2968478
37	Aminah binti Abd Manan	013-3218587
38	Aminah bt Tayit	017-6426883
39	Samsiah bt Yasin	017-6843191
40	Aminah binti Haji Talib	
41	Zulkepli bin Hassan	014-2699907
42	Yahaya bin Kamarudin	019-3791853
43	Halimah Tone binti Hj. Saari	019-3791853
44	Asharn bin Hj. Mohd Amin	03-4212091
45	Ishak bin Ibrahim	011-3225379

8

46	Nursjamsi bt Anuar	012-2430484
47	Mek Yam binti Yusoh	016-2690265

LAMPIRAN 2
KEPUTUSAN KESELURUHAN STATUS KESIHATAN WARGA EMAS PPR KUALA LUMPUR PADA TAHUN LALU

i. Kelaziman sindrom keuzuran mengikut jantina :

Status Sindrom Keuzuran	Jumlah (n = 301)	Lelaki (n = 92)	Perempuan (n = 209)
Normal	34 (11.3%)	15 (16.3%)	19 (9.1%)
Pra - keuzuran	219 (72.8%)	66 (71.7%)	153 (73.2%)
Uzur	48 (15.9%)	11 (12.0%)	37 (17.7%)

(Camilla Wahida et al., 2019)

ii. Pembahagian sindrom keuzuran mengikut ciri-ciri fenotip :

Ciri - ciri fenotip	Jumlah	Lelaki	Perempuan
Penyusutan berat badan	37 (12.3%)	17 (45.9%)	20 (54.1%)
Kelemahan	239 (79.4%)	63 (26.4%)	176 (73.6%)
Kelelahan	61 (20.3%)	10 (16.4%)	51 (83.6%)
Kelambatan	81 (26.9%)	21 (25.9%)	60 (74.1%)
Kekurangan aktiviti fizikal	58 (19.3%)	19 (32.8%)	39 (67.2%)

(Camilla Wahida et al., 2019)

LAMPIRAN 3

AHLI JAWATAN KUASA PELAKSANA
PROGRAM KESIHATAN KOMUNITI

JAWATAN	NAMA	NO. TELEFON
PERSON IN CHARGE	Wan Hyssna binti Wan Omar	013-3959237
AHLI JAWATAN KUASA	Nur Najatul Munirah binti Muhamad Bokeri	018-3187874
	Camilla Wahida binti Norazman	018-7713642
	Nurul Izzati	017-3821050
	Siti Nur Amirah binti Mohd Adnan	019-9395319
	Mohamad Aiman bin Kamarul Azizi	017-5974927

11

LAMPIRAN 4

TENTATIF PROGRAM

7.00 AM	Set up tempat
7.30 AM	Kelibaan peserta
8.00 AM	Perasmian majlis oleh Wakil Penduduk
8.15 AM	Taklimat ringkas akan diberikan oleh pihak UPM
8.20 AM	Sarapan untuk wakil pendudukan dan peserta
8.30 AM – 12 PM	• Peserta mendaftar di meja pendaftaran (STESEN 1) dan perlu menunjukkan kad pengenalan kepada PIC • PIC mencatat nombor kad pengenalan dan nombor badan peserta • Bahagian A, B, C, D dan Ujian Jamar Handgrip akan dibacakan oleh PIC kepada responden di STESEN 1 • Setelah selesai, PIC akan menanda tangan di "Checklist Checkpoint" • PIC akan mengarahkan peserta untuk pergi ke stesen-stesen yang kosong. • PIC stesen tersebut akan menandatangani "Checklist Checkpoint" apabila tamat mengambil data • Apabila peserta telah selesai disemua stesen, peserta perlu memberi borang kaji selidik di STESEN 1 dan cenderahati akan diberikan
12 PM	Ucapan penutupan oleh wakil pendudukan
12.15 PM	Makan tengahari

12

LOGISTIK YANG DIPERLUKAN

BARANG - BARANG PPR	KUANTITI	KELUAR	MASUK
Kerusi	50		
Meja	10		
Mikrofon	1		
Speaker	1		
Plug	1		

APPENDIX X

Subject information sheet & informed consent



JAWATANKUASA ETIKA UNIVERSITI UNTUK
PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)
UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

BORANG 2.4: PENERANGAN DAN PERSETUJUAN RESPONDEN

Sila baca maklumat berikut dengan teliti. Sekiranya anda mempunyai sebarang pertanyaan, sila kemukakan kepada penyelidik.

1. TAJUK KAJIAN

Perubahan Status Keuzuran Selepas Setahun Kajian Susulan dan Faktor – Faktor yang Berkaitan Dengan Sarkopenia Dalam Kalangan Warga Emas di PPR Kuala Lumpur.

2. PENGENALAN

Keuzuran dan sarkopenia (kehilangan jisim otot) adalah perkara lazim yang akan dihadapi dalam kalangan warga emas. Kajian terdahulu menyatakan bahawa dua faktor ini mempengaruhi dan memberi impak yang negatif terhadap kesihatan dalam kalangan warga emas. Sekiranya tidak dikesan dengan lebih awal, kematian berkemungkinan boleh berlaku. Kelazman warga emas mengalami sindrom keuzuran dan sarkopenia semakin meningkat dalam kalangan komuniti warga emas tidak kira di bandar mahupun di luar bandar. Keputusan akhir program kesihatan tahun lalu mengatakan bahawa kelazman warga emas yang mendiami PPR Kuala Lumpur yang mengalami pra-keuzuran (72.8%) adalah yang tertinggi, yang kedua tertinggi adalah warga emas yang mengalami keuzuran (15.9%) dan peratusan warga emas yang normal adalah 11.3%. Oleh yang demikian, kajian ini bertujuan untuk melihat perubahan status keuzuran selepas setahun kajian susulan dan juga melihat faktor-faktor yang berkaitan dengan sarkopenia dari segi sosio-demografi; laporan sendiri penyakit kronik; kemurungan; ujian status kefungsi; status keuzuran; tahap aktiviti fizikal; risiko malpemakanan; status kognitif; penilaian tahap pemahaman, sikap dan amalan terhadap sindrom keuzuran, senaman dan pemakanan; komposisi badan dan sejarah pemakanan bagi penduduk warga emas yang berumur 60 tahun ke atas di PPR Kuala Lumpur.

Kajian ini adalah sebahagian daripada keperluan untuk bergraduat bagi pelajar tahun akhir program Bachelor Sains (Pemakanan dan Kesihatan Komuniti) dan Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia (UPM). Kajian ini telah mendapat kelulusan daripada pihak Jawatan Kuasa Etika Penyelidikan UPM.

Sarapan dan hadiah akan diberikan kepada setiap peserta sebagai tanda penghargaan kami terhadap mereka atas penglibatan mereka secara langsung dalam kajian selidik ini.

3. APAKAH YANG PERLU ANDA LAKUKAN?

Sila ambil masa dengan secukupnya untuk membaca dan memahami dengan teliti terhadap penerangan yang diberikan sebelum anda bersetuju untuk menyertai kajian selidik ini. Jika terdapat sebarang kemusykilan atau memerlukan penerangan dengan lebih lanjut, anda boleh menghubungi atau bertanya dengan penyelidik-penyelidik yang terlibat dalam kajian selidik ini.

Sila tandatangan di sini sekiranya anda telah membaca dan memahami kandungan halaman ini _____

JKEUPM/FORM 2.4
VERSION: 17 JULY 2017

Page 1

Setelah anda berpuas hati dengan maklumat yang diberi dan memahami penyelidikan ini, dan anda juga berminat untuk turut serta, anda dikehendaki untuk menandatangani Borang Persetujuan ini (muka surat 4).

Penyertaan anda dalam penyelidikan ini adalah secara sukarela. Anda tidak perlu menyertai penyelidikan ini jika anda tidak bersetuju. Anda juga mempunyai hak untuk tidak menjawab mana-mana soalan atau tidak menyertai mana-mana aktiviti. Anda juga boleh menarik diri daripada penyelidikan ini pada bila-bila masa sahaja tanpa dikenakan sebarang penalti atau apa – apa yang berkenaan dengannya.

Dalam kaji selidik ini, anda akan ditemu bual oleh penyelidik dan pembantu penyelidik tertatih menggunakan borang soal selidik. Ia terbahagi kepada (12) bahagian iaitu Bahagian A (latar belakang responden), bahagian B (laporan sendiri penyakit kronik), bahagian C (penilaian tahap kemurungan), bahagian D (ujian status fungsian), bahagian E (penilaian status keuzuran), bahagian F (penilaian aktiviti fizikal), bahagian G (penilaian sindrom keuzuran), bahagian H (penilaian risiko malpemakanan), bahagian I (penilaian status kognitif), bahagian J (penilaian tahap pemahaman, sikap dan amalan terhadap sindrom keuzuran, senaman dan pemakanan) dan bahagian K (sejarah pemakanan berstruktur dan bahagian L (pengukuran anthropometri). Jangkaan masa yang diperlukan untuk temubual adalah kurang daripada 60 minit.

Di akhir kajian ini, anda akan menerima sumbangan berbentuk peralatan dapur.

4. SIAPA YANG TIDAK BOLEH MENYERTA KAJIAN INI?

Berumur bawah 60 tahun, tidak mampu bergerak tanpa sokongan, tidak mampu bertutur, membaca serta menulis, mempunyai penyakit yang tidak boleh sembuh, berpindah ke luar kawasan PPR Kuala Lumpur dan mempunyai penyakit Alzheimer dan Dementia.

5. APAKAH FAEDAH MENYERTA KAJIAN INI?

a) KEPADA ANDA SEBAGAI PESERTA?

Hasil daripada kajian ini, anda berpeluang untuk mengetahui status kesihatan antaranya ialah Indeks Jisim Tubuh (BMI), jisim otot dan peratusan lemak visceral dan lemak dalam badan

b) KEPADA PENYELIDIK?

Berdasarkan kajian ini, penyelidik dapat mengetahui perubahan status keuzuran selepas setahun kajian susulan dan faktor – faktor yang berkaitan dengan sarkopenia dalam kalangan warga emas di PPR Kuala Lumpur.

6. ADAKAH IA BERISIKO?

Ada kemungkinan anda berisiko mendapat sakit sendi, pening kepala, kelesuan, degupan jantung yang laju, sesak nafas, pitam dan terjatuh sekiranya senaman tidak dilakukan dengan kaedah yang betul. Namun begitu, dalam kajian ini kami sangat menutamakan keselamatan anda.

Sila tandatangan di sini sekiranya anda telah membaca dan memahami kandungan halaman ini _____

7. ADAKAH MAKLUMAT DAN IDENTITI SAYA KEKAL RAHSIA?

Segala maklumat yang diberikan adalah sulit dan hanya akan digunakan untuk tujuan kajian sahaja. Anda akan diberikan ID unik dalam rekod kajian.

8. SIAPA YANG SAYA PERLU HUBUNGI SEKIRANYA SAYA MEMPUNYAI SOALAN TAMBAHAN SEMASA MENGIKUTI PENYELIDIKAN INI?

Jika anda mempunyai sebarang masalah atau soalan berkaitan dengan kajian ini, anda boleh terus menghubungi penyelidik:

Nur Najatul Munirah binti Muhamad Bokery (Pelajar Ijazah Sarjana Muda)
No. Tel : 018-3187874
Emel : najatulmunirah@gmail.com

Wan Hysena binti Wan Omar (Pelajar Ijazah Sarjana Muda)
No. Tel : 013-3959237
Emel : syina29@gmail.com

Prof. Madya Dr. Siti Nur'Asyura Binti Adznam (Pensyarah/ Pengerusi Jawatankuasa Penyellaan)
No. Tel : 03-89472481
Email : asyura@upm.edu.my

Sila tandatangan di sini/ sekiranya anda telah membaca dan memahami kandungan halaman ini _____

9. PERSETUJUAN

Saya..... No Kad Pengenalan.....
beralamat.....

.....dengan ini bersetuju untuk mengambil bahagian secara sukarela dalam penyelidikan yang tersebut di atas *(kajian klinikal/percubaan ubat-ubatan/rakaman video/kumpulan sasaran/temuduga/ soal selidik).

Saya telah diberi penjelasan secara menyeluruh mengenai penyelidikan ini dari segi metodologi, risiko dan komplikasi (seperti tertulis pada Helaiian Penerangan Responden). Saya memahami bahawa saya berhak menarik diri dari penyelidikan ini pada bila-bila masa tanpa memberi sebarang alasan. Saya juga memahami bahawa sebarang maklumat yang berkaitan identiti saya akan dirahsiakan.

Saya* berminat / tidak berminat untuk mengetahui keputusan kajian yang melibatkan saya.

I setuju/tidak bersetuju untuk imej/gambar/rakaman video/ rakaman suara digunakan dalam apa jua bentuk penerbitan atau pembentangan. (sekiranya berkaitan).

*potong yang tidak berkenaan

Tandatangan..... Tandatangan.....
(Responden) (Saksi)

Tarikh :..... Nama :.....
No. K/P:.....

Saya mengesahkan bahawa saya telah menerangkan kepada responden ini sifat dan tujuan penyelidikan yang tersebut di atas.

Tarikh..... Tandatangan.....
(Penyelidik)

UPM
UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI

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 4. Sekolah menengah rendah 2. ☐ Sekolah agama/pondok 5. ☐ Sekolah menengah atas 3. ☐ Sekolah rendah 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: _____) ALAMAT : _____ _____	
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 (Jumlah : RM _____) 2. ☐ Pencen (Jumlah : RM _____) 3. ☐ Kebajikan (Jumlah : RM _____) 4. ☐ Anak-anak / Ahli keluarga (Jumlah : RM _____) 5. ☐ Lain-lain. Nyatakan _____	
9.	ANGGARAN JUMLAH PENDAPATAN ISI RUMAH RM: _____	

b) ☐ Bertanggungjawab jika ubat disediakan terlebih dahulu dalam dos berasingan	1	
c) ☐ Boleh mengambil ubat mengikut dos/sukatan yang betul pada masa yang betul		
8. Di dalam menguruskan wang, adakah anda	0	
a) ☐ Tidak berkemampuan untuk menguruskan wang sendiri	1	
b) ☐ Mengurus pembelian harian, tetapi perlukan bantuan parbankan, belian besar	1	
c) ☐ Mampu menguruskan wang sendiri termasuk urusan pembayaran bil		
Jumlah Skor :		

BAHAGIAN C: 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 <u>7 hari yang lepas</u>, 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 <u>jam dalam sehari</u> anda terlibat dalam aktiviti keadaan duduk tersebut? 1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥ 4 jam
2	Dalam tempoh <u>7 hari yang lepas</u>, berapa kerapkah anda <u>berjalan di luar rumah atau halaman rumah</u> 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 <u>jam dalam sehari</u> anda terlibat dalam aktiviti keadaan tersebut? 1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥ 4 jam

3	Dalam tempoh <u>7 hari yang lepas</u>, 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: Secara purata, berapa <u>jam dalam sehari</u> anda terlibat dalam aktiviti keadaan tersebut? 1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥ 4 jam
4	Dalam tempoh <u>7 hari yang lepas</u>, 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 <u>jam dalam sehari</u> anda terlibat dalam aktiviti keadaan tersebut? 1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥ 4 jam
5	Dalam tempoh <u>7 hari yang lepas</u>, 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 <u>jam dalam sehari</u> anda terlibat dalam aktiviti keadaan tersebut? 1. ☐ < 1 jam 2. ☐ 1- < 2 jam 3. ☐ 2- < 4 jam 4. ☐ ≥ 4 jam

6	Dalam tempoh <u>7 hari yang lepas</u>, 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 <u>jam dalam sehari</u> anda terlibat dalam aktiviti keadaan tersebut? 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 membaiki 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 <u>7 hari yang lepas</u>, 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)
--	---

BAHAGIAN D : RISIKO MALPEMAKANAN

Mini Nutritional Assessment-Short Form (MNA-SF)

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/m² 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

BAHAGIAN E: SOAL-SELIDIK SEJARAH PEMAKANAN BERSTRUKTUR

Bolehkah Pakcik atau Makcik memberikan maklumat tentang apa yang biasa Pakcik atau Makcik makan atau minum dari bangun pagi hingga ke malam sebelum tidur

Kekerapan pengambilan: 1-setiap hari 2-hampir setiap hari (5-6 kali seminggu) 3-kadang-kadang 4-jarang (1-2kali seminggu) 5- jarang (kurang dari sekali seminggu) 6-tiada

Masa makan: _____

Tempat makan: 1- Rumah 2- Kedai 3 - Tempat kerja 4 - Lain-lain (sila nyatakan _____)

Bersama siapa makan: 1-Seorang diri 2- Keluarga 3 -Rakan-rakan 4 - Lain-lain (sila nyatakan _____)

Jenis hidangan	Saiz porsi	Gambaran/ kaedah masakan	Saiz porsi	Komen	Kegunaan Pejabat
	(ukuran rumahtangga dan model makanan)		(ukuran rumahtangga dan model makanan)	(Kekerapan pengambilan)	Kod Jumlah makanan (g)
<u>Nasi:</u> nasi lemak / nasi putih/nasi goreng /bubur /lain-lain _____	_____ mangkuk (B/S/K) (b/p) _____ bungkus (____sen)	Kuah/sos/lauk: _____ _____	_____ tsp/dsp (b/p) _____ mangkuk (B/S/K) (b/p)		
<u>Mee/Bihun/Laksa:</u> goreng/rebus/kari/ sup/lain-lain _____	_____ mangkuk (B/S/K) _____ bungkus (____sen)	Kuah/sos/lauk: _____ _____	_____ dsp (b/p) _____ mangkuk (B/S/K) (b/p)		
<u>Roti:</u> putih/serabut tinggi/roti canai/capati/tosei/ roti telur _____	_____ keping (B/K) _____ sen/keping	Kuah/lauk/cecah _____ _____	_____ dsp (b/p) _____ mangkuk (B/S/K)		
<u>Kuih-muih</u> /lempeng/ Cekodok/ lain-lain	_____ keping (B/S/K)	Kuah/sos:	_____ dsp (b/p)		

Jenis hidangan	Saiz porsi	Gambaran/ kaedah masakan	Saiz porsi	Komen	Kegunaan Pejabat
_____	_____ sen/keping	_____ _____ _____	_____ mangkuk (B/S/K)		
<u>Lain-lain:</u> Ubikayu /keledak /keladi /sukun _____					
<u>Minuman:</u> kopi/teh/nescaffe/ koko/horliks/lain-lain _____ air kosong	_____ gelas/cawan	kopi/teh/koko/ horlicks/lain-lain gula susu (skim/rendah lemak/penuh krim/cair/pekat)	_____ tsp/dsp (b/p) _____ tsp/dsp (b/p) _____ tsp/dsp (b/p)		

MINUM PAGI

Kekerapan pengambilan: 1-setiap hari 2-hampir setiap hari (5-6kali seminggu) 3-kadang-kadang 4-jarang (1-2kali seminggu) (kurang dari sekali seminggu) 6-tiada

5- jarang

Masa makan: _____

Tempat makan: 1- Rumah 2- Kedai 3 - Tempat kerja 4 - Lain-lain (sila nyatakan _____)

Bersama siapa makan: 1-Seorang diri 2- Keluarga 3 -Rakan-rakan 4 - Lain-lain (sila nyatakan _____)

Jenis hidangan	Saiz porsi	Gambaran/ kaedah masakan	Saiz porsi	Komen	Kegunaan Pejabat
	(ukuran rumahtangga dan model makanan)		(ukuran rumahtangga dan model makanan)	(Kekerapan pengambilan)	Kod Jumlah makanan (g)
Kuih-muih /lempeng/cekodok / lain-lain ; _____	____ keping (B/S/K) ____ sen/keping	Kuah/sos: _____ _____	____ dsp (b/p) ____ mangkuk (B/S/K)		
Lain-lain: Ubikayu /keledak/keladi/ sukun _____					
Minuman: kopi/teh/nescaffe/ koko/horliks/lain-lain _____ air kosong	____ gelas/cawan	kopi/teh/koko/ horlicks/lain-lain gula susu (skim/rendah lemak/penuh krim/cair/pekat)	____tsp/dsp (b/p) ____tsp/dsp (b/p) ____tsp/dsp (b/p)		

MAKAN TENGAH HARI

Kekerapan pengambilan: 1-setiap hari 2-hampir setiap hari (5-6kali seminggu) 3-kadang-kadang 4-jarang (1-2kali seminggu) jarang (kurang dari sekali seminggu) 6-tiada

Masa makan: _____

Tempat makan: 1- Rumah 2- Kedai 3 - Tempat kerja 4 - Lain-lain (sila nyatakan_____)

Bersama siapa makan: 1-Seorang diri 2- Keluarga 3 -Rakan-rakan 4 - Lain-lain (sila nyatakan_____)

5-

Jenis hidangan	Saiz porsi	Gambaran/ kaedah masakan	Saiz porsi	Komen	Kegunaan Pejabat
	(ukuran rumahtangga dan model makanan)		(ukuran rumahtangga dan model makanan)	(Kekerapan pengambilan)	Kod jumlah makanan(g)
Nasi: putih/goreng/bubur lain-lain: _____	_____ mangkuk (B/S/K) (b/p)	Lauk/kuah/sos: _____ _____			
Lauk-pauk: a) Ikan (jenis: _____) b) Ayam (berkulit dan lemak/tidak) c) Daging (jenis: _____) (berlemak/tidak) d) Telur (jenis: _____) Kekacang: tempeh /tauhu / _____) Makanan laut: _____) Lain- lain: _____	_____keping (B/S/K) _____keping (B/S/K) _____keping (B/S/K) _____keping (B/S/K) 	Kaedah masakan: _____ _____ _____ _____ _____ _____ _____ _____	Kuah: _____ dsp/tsp _____ mangkuk (B/S/K) 		
Sayur-sayuran/ulam: Jenis: _____	_____ dsp _____ mangkuk (B/S/K)	Kaedah masakan: _____ _____	Kuah: _____ dsp/tsp		

pecal sayuran (kacang panjang/ taugheh/ /pucuk ubi) _____		_____			
Lauk-pauk tambahan: Ikan kering/jeruk/ pekasam/sambal belacan/tempoyak lain-lain: _____	____keping ____tsp/dsp ____tsp/dsp				
Buah-buahan: Jenis: _____ (makan bersama kulit/tidak)	____keping(B/S/K) ____biji (B/S/K)	Sos/cicah: ____ ____	____tsp/dsp		
Lain-lain:_____)					
Minuman: air kosong kordial (jenis:_____) lain-lain:_____)	____tsp/dsp ____gelas/cawan				
Makanan/minuman ringan di antara waktu makan: _____ _____					

MINUM PETANG

Kekerapan pengambilan: 1-setiap hari 2-hampir setiap hari (5-6kali seminggu) 3-kadang-kadang 4-jarang (1-2kali seminggu) 5- jarang (kurang dari sekali seminggu) 6-tiada

Masa makan: _____

Tempat makan: 1- Rumah 2- Kedai 3 - Tempat kerja 4 - Lain-lain (sila nyatakan _____)

Bersama siapa makan: 1-Seorang diri 2- Keluarga 3 -Rakan-rakan 4 - Lain-lain (sila nyatakan _____)

Jenis hidangan	Saiz porsi	Gambaran/ kaedah masakan	Saiz porsi	Komen	Kegunaan Pejabat
	(ukuran rumahtangga dan model makanan)		(ukuran rumahtangga dan model makanan)	(Kekerapan pengambilan)	Kod jumlah makanan (g)
Kuih-muih /lempeng/cekodok / lain-lain ; _____	_____ keping (B/S/K) _____ sen/keping	Kuah/sos: _____ _____	_____ dsp (b/p) _____ mangkuk (B/S/K)		
Lain-lain: Ubikayu /keledek/keladi/ sukun _____					
Minuman: kopi/teh/nescaffe/ koko/horliks/lain-lain _____ air kosong	_____ gelas/cawan	kopi/teh/koko/ horlicks/lain-lain gula susu (skim/rendah lemak/penuh krim/cair/pekat)	_____ tsp/dsp (b/p) _____ tsp/dsp (b/p) _____ tsp/dsp (b/p)		

MAKAN MALAM

Kekerapan pengambilan: 1-setiap hari 2-hampir setiap hari (5-6kali seminggu) 3-kadang-kadang 4-jarang (1-2kali seminggu) 5- jarang (kurang dari sekali seminggu) 6-tiada

Masa makan: _____

Tempat makan: 1- Rumah 2- Kedai 3 - Tempat kerja 4 - Lain-lain (sila nyatakan _____)

Bersama siapa makan: 1-Seorang diri 2- Keluarga 3 -Rakan-rakan 4 - Lain-lain (sila nyatakan _____)

Jenis hidangan	Saiz porsi	Gambaran/ kaedah masakan	Saiz porsi	Komen	Kegunaan Pejabat
	(ukuran rumahtangga dan model makanan)		(ukuran rumahtangga dan model makanan)	(Kekerapan pengambilan)	Kod jumlah makanan(g)
<u>Nasi:</u> putih/goreng/bubur lain-lain: _____	____ mangkuk (B/S/K) (b/p)	Lauk/kuah/sos: _____ _____			
<u>Lauk-pauk:</u> e) Ikan (jenis: _____) f) Ayam (berkulit dan lemak/tidak) g) Daging (jenis: _____) (berlemak/tidak) h) Telur (jenis: _____) <u>Kekacang:</u> tempeh /tauhu / _____) Makanan laut: _____ Lain- lain: _____	____keping (B/S/K) ____keping (B/S/K) ____keping (B/S/K) ____keping (B/S/K)	Kaedah masakan: _____ _____ _____ _____ _____ _____ _____ _____	Kuah: ____ dsp/tsp ____ mangkuk (B/S/K)		

<u>Sayur-sayuran/ulam:</u> Jenis: _____ pecal sayuran (kacang panjang/ taueh/ /pucuk ubi) _____	_____ dsp _____ mangkuk (B/S/K)	Kaedah masakan: _____ _____ _____	Kuah: _____ dsp/tsp		
<u>Lauk-pauk tambahan:</u> Ikan kering/jeruk/ pekasam/sambal belacan/tempoyak lain-lain: _____	_____ keping _____ tsp/dsp _____ tsp/dsp				
<u>Buah-buahan:</u> Jenis: _____ (makan bersama kulit/tidak)	_____ keping(B/S/K) _____ biji (B/S/K)	Sos/cicah: _____ _____	_____ tsp/dsp		
Lain-lain: _____)					
<u>Minuman:</u> air kosong kordial (jenis: _____) lain-lain: _____)	_____ tsp/dsp _____ gelas/cawan				
Makanan/minuman ringan di antara waktu makan: _____					

Kod panduan :

B: besar

S: sederhana

K: kecil

b: bumbung

p: paras

tsp: sudu kecil

dsp: sudu besar

BAHAGIAN F: PENGUKURAN ANTROPOMETRI

1. Lengkapkan penilaian di bawah

PARAMETER	ALAT	BACAAN 1	BACAAN 2	PURATA	CATATAN
Tinggi berdiri (cm)	SECA Stadiometer 213				
Berat badan (kg)	Omron BIA (HBF-375)				
BMI kg/m ²					
Skeletal Muscle mass					
Lemak badan (%) Body Fat					
Visceral Fat					
Resting Metabolic rate					
Ukurlilit pinggang (cm)	Lufkin measuring tape (W606PM -375)				
Ukurlilit lengan atas, MUAC (cm)					
Ukurlilit betis, CC (cm)					
Kekuatan Genggaman Tangan	Jamar Hand Dynamometer				

Berjalan 4 meter: _____ saat

2. Adakah responden tidak dapat berdiri tegak atay mengalami khyposis (bongkok)?

Jika ya, panjang depa tangan (cm) perlu diambil. (** Ambil satu bacaan kepada 0.1 cm/kg terhampir**)

Khyposis	1. ☐ Ya 2. ☐ Tidak (terus ke bahagian kedua)				
Panjang depa tangan (cm)	ALAT	BACAAN 1	BACAAN 2	PURATA	CATATAN
	Lufkin measuring tape W606PM				