



UNIVERSITI PUTRA MALAYSIA

***FRAILITY AND ITS ASSOCIATED FACTORS AMONG HAEMODIALYSIS
PATIENTS IN SELECTED DIALYSIS CENTERS IN SELANGOR***

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FPSK6 2020 21**

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BY

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A project submitted as a partial fulfilment of the requirement for the degree of Bachelor of
Science (Dietetics) from the Faculty of Medicine and Health Sciences, Universiti Putra

Malaysia

APPROVAL

This project entitled Frailty and Its Associated Factors among Haemodialysis Patients in Selected Dialysis Centres in Selangor, Malaysia was prepared by Abdullah bin Abd Wahab and submitted to Faculty of Medicines and Health Sciences as a part of requirement for the degree in program of Bachelor of Science (Dietetics) of Faculty of Medicines and Health Sciences, Universiti Putra Malaysia.

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DECLARATION

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



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ACKNOWLEDGEMENT

First of all, I would like to express my greatest gratitude and appreciation to my research study supervisors. Professor Dr. Chan Yoke Mun for all her guidance and efforts to help me in this study. Without her dedicated assistance and involvement in every step of this process, I would never be able to make this happen.

I also would like to thank all lecturers and academic staffs of Department of Nutrition and Dietetics, Universiti Putra Malaysia for their help, assists and cooperation throughout my study. I am appreciated everything during my time as one of dietetics students in Faculty of Medicines and Health Sciences.

Specials thanks also to people who are supporting and helping me to go through with this process who are Nur Imanina Izati, Ng Jing Wen and Ng Pee Chien. They are always be there unconditionally when I need help or support regarding my research.

Last but not least, I am so grateful for every unfailing support and continuous encouragement from my family members especially my parents throughout this research till the end of thesis writing and my years of study. I would not be able to here right now without them with me all the time. Thank you.

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LIST OF ABBREVIATIONS

CKD	Chronic kidney disease
ESRD	End-stage renal disease
PD	Peritoneal dialysis
HD	Haemodialysis
GFR	Glomerular filtration rate
MYR	Malaysian ringgit



ABSTRACT

Frailty and Its Associated Factors among Haemodialysis Patients in Selected Dialysis Centres in Selangor

Frailty usually associated with aging however, people are undergo haemodialysis treatment are also at risk of getting frail. Thus, study aimed to determine the associations between socio-demographic characteristics, social support, protein intake, physical activity and depression with frailty among haemodialysis patients in selected dialysis centres in Selangor, Malaysia. This was a cross-sectional study which involved 54 haemodialysis patients who are 18 years old and above. Socio-demographic characteristics information were obtained using self-developed questionnaire. Social support of patients were assessed based on Multidimensional Scale of Perceived Social Support (MSPSS) questionnaire while physical activity level of patients will be assessed using International Physical Activity Questionnaire (IPAQ). Protein intake of patients will be determined using 2-day 24-hour diet recall. For depression, Beck Depression Inventory (BDI) was used to assess patients' depression level. Frailty status was determined using Frailty Phenotype Questionnaire (FPQ). The distribution of pre-frail and frail was 57.4% and 37.0% respectively. This study found out that frailty was statistically significant associated with socio-demographic characteristic (age), protein intake and depression with $p < 0.05$. Other characteristics of socio-demographics, social support and physical activity were not associated with frailty. Overall, high proportion of haemodialysis patients who were pre-frail and frail, deserve attentions from relevant authorities in order to improve the quality of life and decrease the risk of falls and fractures that can cause mortality. Protein intake and depression among haemodialysis patients also should be concerned as these factors were associated with frailty among haemodialysis patients.

ABSTRAK

Kelemahan Badan dan Faktor-faktor yang Berkaitan di Kalangan Pesakit Hemodialisis di Pusat Dialisis yang Dipilih di Selangor

Kelemahan biasanya dikaitkan dengan penuaan namun, orang yang menjalani rawatan hemodialisis juga berisiko mengalami kelemahan. Oleh itu, kajian bertujuan untuk menentukan hubungan antara ciri sosio-demografi, sokongan sosial, pengambilan protein, aktiviti fizikal dan kemurungan dengan kelemahan di kalangan pesakit hemodialisis di pusat dialisis terpilih di Selangor, Malaysia. Ini adalah kajian keratan rentas yang melibatkan 54 pesakit hemodialisis yang berumur 18 tahun ke atas. Maklumat ciri sosio-demografi diperoleh dengan menggunakan soal selidik. Sokongan sosial pesakit dinilai berdasarkan soal selidik Multidimensional Scale of Perceived Social Support (MSPSS) sementara tahap aktiviti fizikal pesakit dinilai menggunakan International Physical Activity Questionnaire (IPAQ). Pengambilan protein pesakit ditentukan menggunakan pemakanan diet 2 hari 24 jam. Untuk kemurungan, Beck Depression Inventory (BDI) digunakan untuk menilai tahap kemurungan pesakit. Status kerentanan ditentukan dengan menggunakan Frailty Phenotype Questionnaire (FPQ). Taburan pra-lemah dan lemah masing-masing adalah 57.4% dan 37.0%. Kajian ini mendapati bahawa kelemahan secara statistik berkaitan dengan ciri sosio-demografi (umur), pengambilan protein dan kemurungan dengan $p < 0,05$. Ciri-ciri sosio-demografi, sokongan sosial dan aktiviti fizikal yang lain tidak berkaitan dengan kelemahan. Secara keseluruhan, jumlah pesakit hemodialisis yang tinggi dan lemah, wajar mendapat perhatian daripada pihak berkuasa yang relevan untuk meningkatkan kualiti hidup dan mengurangkan risiko jatuh dan patah tulang yang boleh menyebabkan kematian. Pengambilan protein dan kemurungan di kalangan pesakit hemodialisis juga harus prihatin kerana faktor-faktor ini dikaitkan dengan kelemahan di kalangan pesakit hemodialisis.

CHAPTER 1

INTRODUCTION

1.0 Study Background

Chronic kidney disease (CKD) is an irreversible and progressive renal impairment that will eventually lead to end-stage renal disease (ESRD) (Arora, Editor, & Batuman, 2019) or also termed as CKD stage 5. End-stage renal disease can be severe enough to be fatal in the absence of dialysis or renal transplantation (Abbasi, 2010). Individual at CKD stage 5 has an estimated glomerular filtration rate (GFR) of less than 15 mL per minute per 1.73 m² body surface area (NKF, 2000), at which the body is unable to excrete nitrogenous waste for example urea, leading to several complications such as hypertension, atherosclerosis, valvular stenosis and insufficiency, chronic heart failure and angina (Zemaitis et al., 2019)

Globally, the incidences of ESRD patients are rising quickly both in developed and developing countries, accompanied with the substantial increase of aging populations. In developed countries such as Taiwan, Japan and United States, more than 1,500 persons per million population (pmp) were affected by ESRD (United States Renal Data System, 2017). Meanwhile, in developing country like Thailand, approximately 22% of their population had either stage 3 or 4 CKD, based on representative sampling (Perkovic et al., 2008). In Malaysia, the prevalence of CKD was 9.07% based on a population-based study in 2011, which is expected to be higher now in light of the growth of prevalence of non-communicable diseases namely diabetes and hypertension in the country (Hooi, 2013). Haemodialysis (HD), peritoneal dialysis (PD) and kidney transplantation are the available modality treatments for ESRD patients, with HD as the most predominant modality treatment. Nearly 45 of reporting countries reported at least 80% of their dialysis patients were on HD treatment in 2015, with the exception in Hong Kong and Mexico (USRDS, 2017). In Malaysia, HD is the most common

approach to treat ESRD with the prevalence rates increased from 879 pmp in 2011 to 1,100 pmp in 2016 (NRR, 2018), attributable to the increasing availability of HD treatment facilities and easier access to public or subsidised funding (Bujang et al., 2017).

Although HD is life-saving, patients on HD are facing several medical issues including frailty (Nitta, Hanafusa, & Tsuchiya, 2017). Frailty will increase vulnerability of an individual to poor resolution of homeostasis following a stress, which increases the risk of adverse outcomes including falls, delirium and disability (Clegg, Young, Iliff, Rikkert, & Rockwood, 2013). A recent study among HD patients in Japan showed 21.4% of their patients were frail while another 52.6% were pre-frail (Takeuchi, Uchida, Kakio, & Okuyama, 2018). The above study reiterated HD patients are at risk of frailty and the prevalence of frailty in HD patients are extremely high compare to the general populations regardless of their age.

1.2 Problem Statement

Frailty is a common geriatric problem among older adults. In Malaysia, the prevalence of frailty is estimated to increase from 11.3% in 2020 to 21% in the year 2050 (Asma et al., 2018). More recently, evidences are growing that CKD patients are at risk of frailty (Nixon et al., 2018; Tennankore, 2019), signify the need for more works on this aspect.

Etiologies of frailty among CKD patients on HD can be multifactorial (Roberto, Fhon, Aparecida, Rodrigues, & Ferreira, 2018), ranging from socio-demographic such as gender, age, marital status and household income (Sánchez-garcía et al., 2014), social support (Woo, Goggins, Sham, & Ho, 2005), physical inactive (Blodgett, Theou, Kirkland, Andreou, & Rockwood, 2015), low protein intake (Rodrigues, Uchida, & Marzetti, 2018) to depression (Sy, 2019). However, findings on factors associated with frailty had been inconsistent (Mezuk,

Edwards, Lohman, Choi, & Lapane, 2012), signifies the need for more studies on this aspect (Lee, 2017; Nixon et al., 2018; Takeuchi, Uchida, Kakio, & Okuyama, 2018)

To the best of knowledge, most of the studies on frailty and its related factors were conducted among Caucasians with scarce of data available for Malaysian. In lieu of the increasing incidences of CKD patients on HD treatment as well as the expected growth of elderly population in Malaysia, more studies on frailty and its associated factors are deemed important. Therefore, the purpose of this study is to investigate the association between socio-demographic characteristics, social support, physical activity, protein intake and depression with frailty to address the following research question:

1. What is the prevalence of frailty among HD patients?
2. What are the socio-demographic characteristics, social support, physical activity level, protein intake and depression among HD patients?
3. Are there any associations between frailty with socio-demographic characteristics, social support, physical activity level, protein intake and depression among HD patients?

1.3 Significance of Study

Studies on frailty are scarce in the local context, with none available among the HD patients. This study can fill the research gap and provide scientific updates on how frailty are associated with socio-demographic characteristics, social supports, physical activity, protein intake and depression among HD patients. With the dissemination of findings, it can be good and reliable resource for the formulation of appropriate programs to improve frailty status among the HD patients which can offer additional benefit on overall quality of life of HD patients. The finding of this study can become a reference for the health care professionals such as dietitian, nurses and doctor in their routine health care management in preventing frailty among HD patients. Last but not least, it is hope that the current study can ignite future similar studies being cross-sectional or longitudinal studies for the benefit of the scientific communities.

1.4 Objectives

General objective:

To determine factors associated with frailty among haemodialysis patients in selected dialysis centres in Selangor.

Specific Objectives:

1. To determine the prevalence of frailty among haemodialysis patients in selected dialysis centres in Selangor
2. To determine the socio-demographic characteristics, social support, physical activity, protein intake and depression among haemodialysis patients
3. To determine the associations between socio-demographic characteristics, social support, physical activity, protein intake and depression with frailty among haemodialysis patients.

1.5 Null Hypothesis

There is no significant association between social-demographic characteristics, social support, physical activity, protein intake and depression with frailty among haemodialysis patients.

1.6 Conceptual Framework

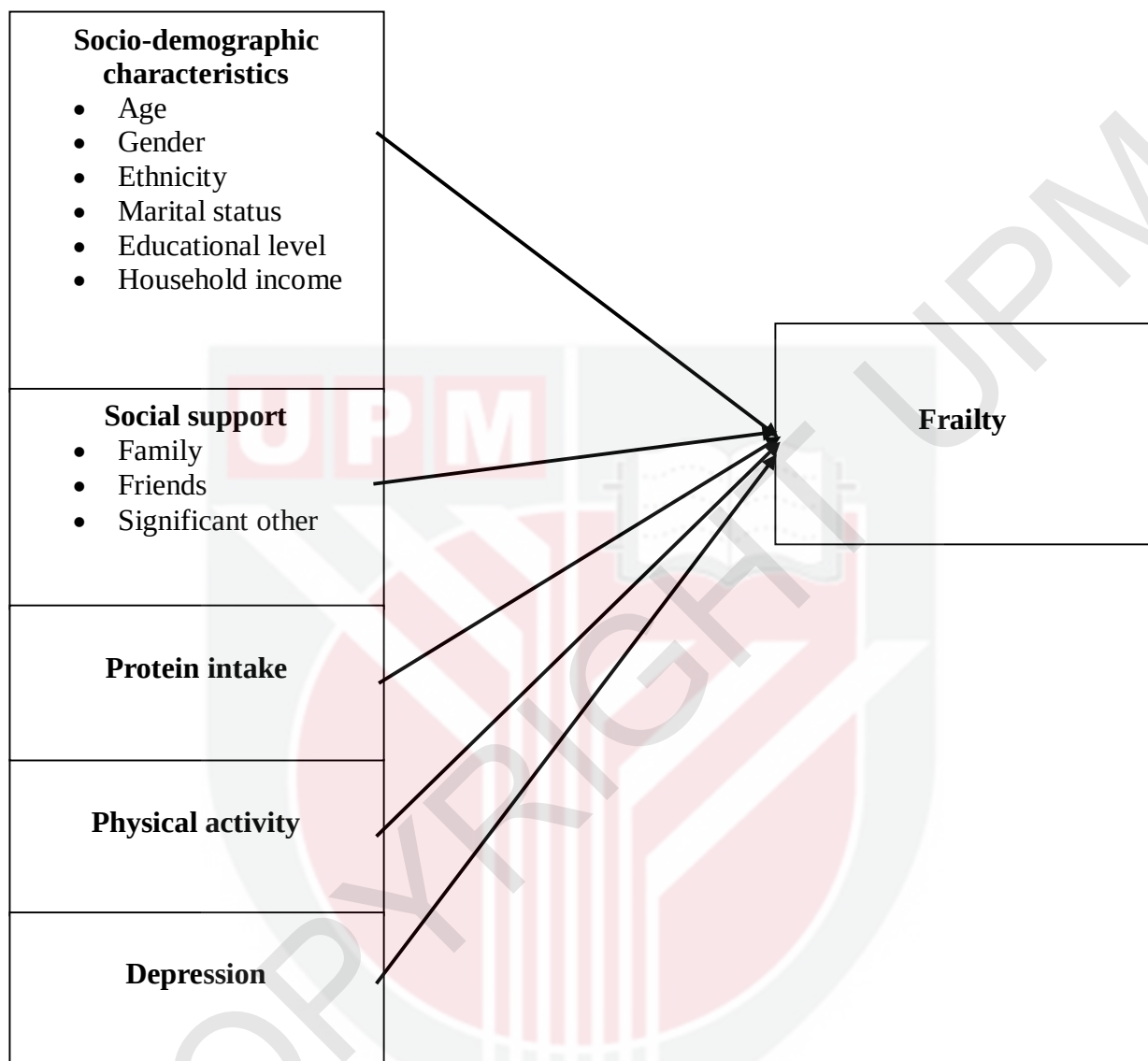


Figure 1.6: Conceptual framework of this study

CHAPTER 2

LITERATURE REVIEW

2.1 Frailty in Malaysia

Frailty is defined as “*biological syndrome of decrease reserved and resistance stressors, characterized by muscle weakness, sarcopenia and fatigue*” and it is associated with several undesirable health outcomes (Crentsil, 2010). The impact of frailty lies in the accelerated decrease of body’s physiological function and loss of the ability to maintain a stable state, leading to the increase of the risk of fall, disability, hospitalization, and death (Eeles et al., 2012; Kojima, Liljas, Iliffe, 2019). Frailty has attracted research interest in the recent years with few studies had been conducted on the prevalence of frailty among Malaysia’s populations. Badrasawi et al. (2017) found that the prevalence of frailty was 8.9% and 61.7% for pre-frail. There was a slight increment of 3.2% as compared to earlier frailty (Sathasivam, Kamaruzzaman, Hairi, & Wan, 2015). This was followed by a more recent study in 2018 which reported a prevalence rate of 9.4% (Ahmad & Hairi, 2018). Based on the limited studies, prevalence of frailty was on a consistent rise among Malaysian, which is as expected, corresponding with the substantial increase of elderly population. It is hypothesized prevalence of frailty among Malaysian may increase at least three-fold in every ten years (Ahmad & Hairi, 2018).

2.2 Factors associated with Frailty

As frailty is a biologic syndrome due to multisystem declines in physiological reserves, multiple factors are involved in its causation (Bortz, 2002), which include low socioeconomic status, living alone, presence of comorbidity and specific chronic diseases, depression, cognitive impairment, poor nutrition (such as micronutrient deficiency), obesity (Blaum CS, Xue, Michelson, et al., 2009; Chang, Phillips, Coppin, et al., 2009; Chang, Weiss, Xue, Fried, et al., 2010; Chen, Wu, Chen, Lue, et al., 2010; Jürschik, Nunin, Botigué, et al., 2012; Semba, Bartali, Zhou, et al., 2006; Strawbridge, Shema, Balfour, et al., 1998; Syddall, Roberts, Evandrou, et al., 2010; Wang, Song, Mitnitski, et al., 2013; Woo, Goggins, Sham, Ho, 2005). The following sections elaborate selective factors associated with frailty.

2.2.1 Socio-demographic characteristics

Earlier local study found socio-demographics characteristics such as age, ethnicity, economic status and educational level were associated with frailty among Malaysian (Badrasawi et al., 2017). In the above study, women were found to be more likely to be frail. From the physiology aspect, women have lower muscle mass compare to men, women also tend to lose their lean body mass with aging faster than men (Badrasawi, Shahar, Kaur, & Singh, 2017). Similar findings were reported among the Spanish (Avila et al., 2011). Other local studies also demonstrated age (Sathasivam et al., 2015; Asma et al., 2018), gender and ethnicity (Sathasivam et al., 2015) were significantly correlated with frailty. The same study also reported that more than 90% of the frail individual had attained low education level. In terms of income, higher household income was associated with lower risk of frailty (Sathasivam et al., 2015). Inconsistency however exist in other study (Asma et al., 2018), whereby household income and gender were not associated with frailty. Being married or living with a partner may decrease the risk of frail too (Asma et al., 2018; Nur Hafizah et al., 2018).

2.2.2 Frailty and Social Support

Lack of social support, together with the physical and functional comorbidities may increase risk of frailty (Generoso, Thaís, Jesus & Zazzetta., 2017). These findings also supported with a recent study in Thailand whereby respondents who were supported by spouse, partner or other family members had lower risk of frailty (Anantapong, Wiwattanaworaset, & Sriplung, 2020). In the local context, similar findings were reported, whereby prevalence of frailty was higher among those who did not get adequate social support compared to those who were living with spouse, partner or family members (Asma et al., 2018; Nur Hafizah et al., 2018). Study by Labra et al. (2018) however reported that there was no significant correlation observed between social support and frailty.

2.2.3 Frailty and Depression

Systematic review reported that there were association between frailty and depression, with frail older person more likely to have depressive symptoms (Vaughan, Corbin, & Goveas, 2015). More recently, review by Chu et al (2019) showed older person with depression are more prone to frailty than are those without depression. Risk for frailty due to depression was sex-specific with higher risk in men compare to women. In the same review paper, depressive symptoms were reported to increase the risk of frailty as the symptoms may affected their behaviour and performance, reduce the social interactions and reduced functional status, hence leads to frailty (Pegorari & Tavares, 2014)

2.2.4 Frailty and Protein Intake

Several studies were available on the possible association between protein intake and risk of frailty, but with inconsistent findings (Rodrigues, Uchida, & Marzetti, 2018). While Shikany et al., (2014) observed that protein intake was inversely associated with pre-frail but no association with frail, Beasley et al., (2010) observed that higher protein intake inversely associated with frailty. In a recent systematic review with five studies with macronutrient data, the association between protein intakes with frailty was not consistent (Lorenzo-lópez et al., 2017). While three of the studies found higher protein intake was associated with lower risk of frailty (Bartali et al., 2006; Kobayashi et al., 2013; Rahi et al. 2016), two studies reported that the amount of protein intake was not associated with frailty (Bollwein et al., 2013; Shikany et al., 2014). It is noteworthy that while amount of protein was not associated with frailty, the distribution of protein intake throughout the day was found to associate with frailty (Bollwein et al., 2013). Specifically, frail older adults showed a more uneven distribution of protein intake

throughout the day with a lower morning intake and a higher midday intake than pre-frail and non-frail older persons. A recent local study showed macronutrients including protein intakes were lowered among frail populations than those who were in robust group, however the intake was not significantly different (Fatin et al., 2019). More studies are warranted to delineate the role of protein in the prevention of frailty or lowering the risk of frailty.

2.2.5 Frailty and Physical Activity

Low physical activity level (<150min/week and sedentary behaviour >540min/day) was found to be associated with frailty (Dantas, Tribess, Meneguci, & Sasaki, 2019). In the above study, frailty was 50% more frequent among those who were physically inactive and practice sedentary lifestyle, as compared to their physically active counterparts. Individual who are sedentary may experience physiological alteration resulting from the process of aging, hence the energy expenditure, maximal oxygen consumption and resting metabolite rate will decrease, leading to higher risk of frailty (Dantas et al., 2019). In addition, due to alteration of body metabolism process, frailty will developed. These findings were supported by the national surveillance study in the United State, National Health and Nutrition Examination Survey (2014), at which sedentary behaviour and physical activity level were correlated with frailty among adults and older adults (Andreou & Rockwood, 2014). The decreased of sedentary behaviour at an hour per day and the addition of moderate-to-vigorous intensity physical activity at an hour per day can lower the risk of being frail (Andreou & Rockwood, 2014). Local study reported similar finding, whereby participants with low physical activity level tend to be frail and those who were frail were less likely to improve towards less frail (Ahmad & Hairi, 2018).

CHAPTER 3

METHODOLOGY

3.1 Study design

This was a cross-sectional study aimed to determine the associations between socio-demographic characteristics, social support, physical activity, protein intake, and depression with frailty among haemodialysis (HD) patients.

3.2 Study location

The study was carried out at selected dialysis centres around Selangor. Selangor is located in the west of Malaysia with the total area of 7,930 square kilometres (km²) with a total population of 6.18 million (Department of Statistic Malaysia, 2015). Based on the National Renal Registry 2018, there are 814 dialysis centres in Malaysia with half of them are located at the central region which are Kuala Lumpur, Selangor and Putrajaya. On the other hand, due to human resource and financial constraints as well as transportation feasibility, study location of this study was in Selangor.

3.3 Sample size determination

A correlation formula (Hulley, Cummings, Browner, Grady, & Newman, 2013) was used to determine the number of patients in this study. The formula used in the calculation is shown below:

$$n = [(Z_{\alpha} + Z_{\beta})/C]^2 + 3$$
$$C = 0.5 * \ln[(1+r)/(1-r)]$$

Where:

N = sample size

The standard normal deviate for $\alpha = Z\alpha = 1.96$

The standard normal deviate for $\beta = Z\beta = 0.84$

r = the expected correlation coefficient

Table 3.3: Calculation of sample size

Variable	Value	Calculation	Sources
Age and frailty	$r = 0.408$	$C = 0.5 * \ln[(1+0.408)/(1-0.408)]$ $= 0.43$ $n = [(1.96+0.84)/0.43]^2 + 3$ $= 45$	(Nolan, 2014)
Depression and frailty	$r = 0.660$	$C = 0.5 * \ln[(1+0.660)/(1-0.660)]$ $= 0.80$ $n = [(1.96+0.84)/0.80]^2 + 3$ $= 15$	(Uchmanowicz & Izabella, 2019)
Protein intake and frailty	$r = 0.580$	$C = 0.5 * \ln[(1+0.580)/(1-0.580)]$ $= 0.66$ $n = [(1.96+0.84)/0.66]^2 + 3$ $= 21$	(Chevalier, Gougeon, Nayar, & Morais, 2019)

Based on the calculations above, the highest calculated sample size ($n = 45$) was used.

The calculated sample size was further increased by 20% to account for possibility of non-response and missing records. Therefore, the total number of participants recruited was 54.

3.4 Sampling design

A non-probability sampling design was used in this study as presented in **Figure 3.1**. Purposive sampling was used to select the HD centres. All patients in the selected private HD centres were approached and recruited according to inclusion criteria.

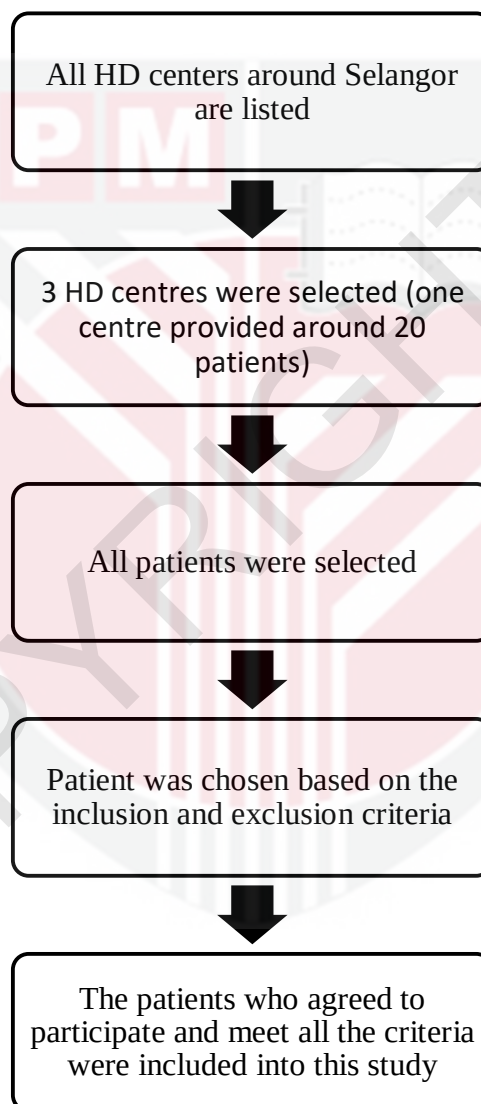


Figure 3.4: Flow chart of sampling

3.5 Respondents

Each respondent was screened for eligibility based on inclusion and exclusion criteria as follows

Table 3.5: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
• Malaysian • At least 18 years of age • Receiving HD session for four hour thrice weekly • Undergo HD treatment for a minimum of three months • Non-demented	• Major sensory, motor or cognitive impairment that may prohibit the completion of assessments • Ever hospitalised for the past three month prior to data collection • HD patients with hepatitis A, B or C

Upon eligibility, subjects' information sheets were distributed to the patients. Study consent was obtained from all patients prior to study enrolment.

3.6 Instrumentations

3.6.1 Socio-demographic characteristics

Patient's socio-demographic characteristics were collected through self-administered questionnaire. The socio-demographic characteristics include in the questionnaire were age, gender, ethnicity, marital status, occupational status, educational level and household income.

3.6.2 Social support

Social support of patients was assessed based on Multidimensional Scale of Perceived Social Support (MSPSS) questionnaire (Zimet, Dahlem, Zimet, & Farley, 1988). This instrument consisted of 12 questions and three different subscale which are family, friends, and significant others. Each question was specified for a certain subscale for example questions no. 3, 4, 8 and 11 were for family subscale, questions no 6, 7, 9 and 12 were for friends subscale while questions no 1, 2, 5 and 10 addressed social support from significant other subscale. Each item is scored based on 7-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree) and the score for each subscale ranged from 4 to 28. This tool was reliable for this study as a study had been done using this tool and the Cronbach alpha value was 0.91 and intra-class correlation coefficient (ICC) was 0.84 (Wongpakaran, Wongpakaran, & Ruktrakul, 2019). The score obtained by the patients were divided into three categories which are low, moderate and high as shown in the following table:

Table 3.6.2: Classification of level of social support

Categories	Score
Low	4 – 12
Moderate	13 – 20
High	21 – 28

3.6.3 Depression

Level of depression of patients in this study was assessed using Beck Depression Inventory (BDI) (Beck & Steer, 1988). The value of Cronbach alpha for this tool was 0.63 and the Spearman's correlation coefficient was 0.80 and these show the reliability of this tool (Jackson-koku, 2016). The questionnaire consisted of 21 questions and was a universal recognised research tool to evaluate the cognitive and neurovegetative characteristics of depression among individuals. Each item was scored based on 4-point Likert scale ranging from 0 (little or no distress) to 3 (severe distress). The total score ranged from 0 to 63. Level of depression of patients were classified according to normal, moderate depressed or severely depressed as shown in the following table:

Table 3.6.3: Classification of level of depression

Categories	Score
Normal	1 – 16
Moderate depression	17 – 30
Severe depression	31 – 63

3.6.4 Physical Activity

Physical activity level of patients was assessed using International Physical Activity Questionnaire (IPAQ) short form created by WHO for physical activity surveillance in

countries. IPAQ comprised from four domains which were leisure time physical activity, domestic and gardening activities, work-related physical activity and transport-related physical activity. For the short form of IPAQ, three of types of specific activity from the four domains were questioned which were walking, moderate-intensity activities and vigorous-intensity activities in the past seven days (International Physical Activity Questionnaire, 2005). The physical activity level (low, moderate or high) was categorized using MET-minutes per week or time spent performing the physical activity. Each of the activity has its own MET value to be calculated for the continuous score which are walking = 3.3 METs, moderate intensity = 4.0 METs and vigorous intensity = 8.0 METs. Total MET-minutes/week scores can be calculated using the formula provided below (International Physical Activity Questionnaire, 2005):

$$\begin{array}{lcl} \text{Total MET-} & = & \text{Walk (METs*min*days) + Moderate (METs*min*days) + Vigorous} \\ \text{minutes/week} & & \text{(METs*min*days)} \end{array}$$

3.6.5 Protein Intake

Protein intake of patients was determined using 2-day 24-hour diet recall (one day of dialysis and one day of non-dialysis day), from the first meal of the day to the last meal before the patients sleep. Few questions were asked to the patients regarding their food intake especially how much they ate the portions of protein in each meal. The portions may be determined by the size, parts or amount of the protein source foods they consumed. If there were any protein sources from the diet recall, further questions such as how much they consume the protein, whether they able to finish all of them and any addition of chicken, meat, egg and other sources of protein are added in their meals. All the data from the diet recall were analysed using Nutritionist Pro to identify the amount of protein for each patient. Adequacy of dietary

protein intake was compared with the recommendations from KDOQI Clinical Practice Guideline for haemodialysis adequacy (2015).

3.6.6 Frailty

Frailty status of the patients was assessed by Frailty Phenotype Questionnaire (Kim, Kim, Jung, & Won, 2019). Frailty Phenotype Questionnaire has a sensitivity of 87%, specificity of 82.5% when compared with the universal Fried Frailty Phenotype (FFP). There are five components to screen frailty which are fatigue (exhaustion), resistance (weakness), ambulation (slowness), inactivity, and loss of weight. Total possible mark was 5 marks. Table 3.6.6 shows the details of Frailty Phenotype Questionnaire and its scoring.

Table 3.6.6: Details of Frailty Phenotype Questionnaire

Item	Questions	Answer Option	Score
Fatigue (Exhaustion)	“During the past few weeks, I felt that everything I did was an effort”	1 Rare (less than 1 day per week) 2 Sometimes (1-2 days per week) 3 Often (3-4 days per week) 4 Most (over 5 days per week)	1 - option 3 or 4 0 - option 1 or 2
Resistance (10 steps stair climbing)	“By yourself and not using aids, do you have any difficulty walking up 10 stairs without resting?”	1 Yes 2 No	1 - option 1 0 - option 2
Ambulation (walking 1 lap of playground; 400m)	“Do you have any difficulty waking one lap of a playground track (400m)?”	1 Unable to do it at all 2 Very difficult 3 A bit difficult 4 Not difficult at all	1 - option 1, 2, or 3 0 - option 4
Inactivity (Moderate to vigorous activity)	“During the past week, how often did you participate in any moderate physical activities that make you slightly more breathless than usual, such as rapid walking, carrying a light item, cleaning, infant care (carrying, bathing)?” (excluding walking)	1 Never 2 More than once per week	1 - option 1 for both questions 0 - others
	“During the past week, how often did you engage in vigorous physical activities, such as vigorous sports, carrying 20 kg or more weights, carrying items up a set of stairs, digging, construction laboring? ”	1 Never 2 More than once per week	
Loss of weight (weight loss of one year)	“Was there an unintended weight loss of 4.5 kg in the past year?”	1 Yes 2 No	1 - option 1 0 - option 2

Patients were classified as robust (non frail) when the total score generated was 0. Patients with total score ranged between 1 and 2 were classified as pre-frail while frail patients were defined with score 3 to 5.

3.7 Study Approval

Prior to data collection, approval for the study was obtained from Ethic Committee for Research Involving Human Subject (JKEUPM) (Appendix 1). In addition, approval from the respective dialysis centres were obtained prior to data collection (Appendix 2).

3.8 Data Collection

Data collection was conducted from February 2020 till the end of March 2020. Firstly, patients were given comprehensive subject's information sheets before they consented to study. This was followed by data collection.

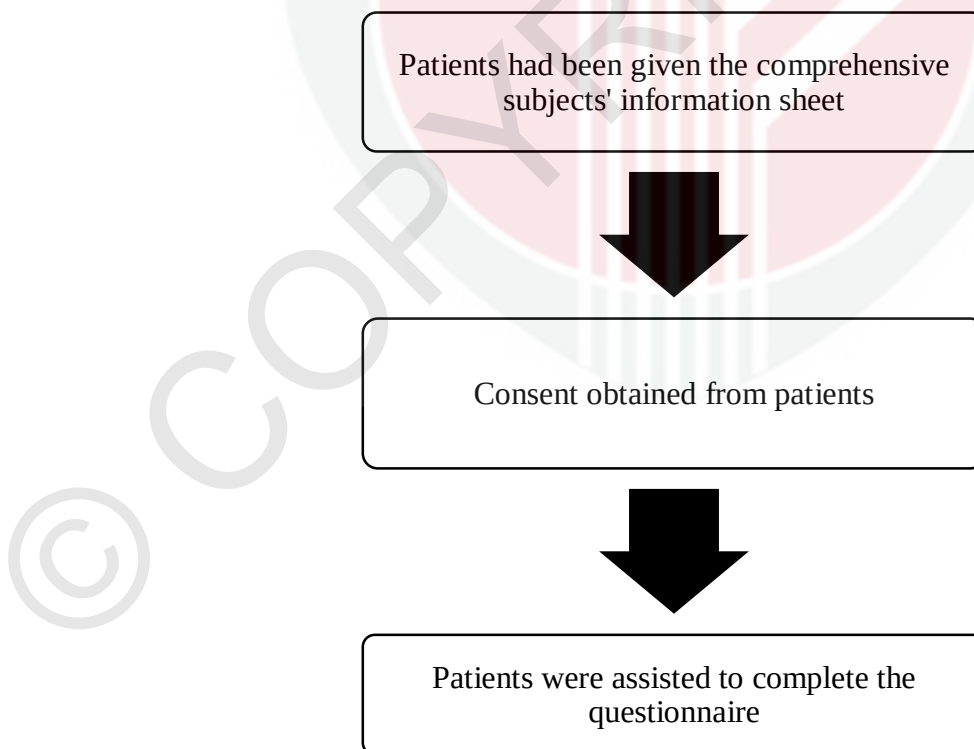


Figure 3.8: Workflow of data collection at HD centres

3.9 Statistical analysis

Statistical analysis was performed using IBM SPSS version 24 with significance level set at $p < 0.05$. Descriptive presented as frequencies (percentages) for categorical data and as means (standard deviations) for continuous variables, respectively. The associations between independent variables which are socio-demographic characteristics, social support, protein intake, physical activity and depression with dependent variable which was frailty, were determined using Pearson correlation test or Fisher's Exact test wherever suitable.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Socio-demographic Characteristics

A total of 54 patients from selected dialysis centres in Selangor took part in this study. Mean age of patients was 54 year old, ranged between 26 to 76 years old where more than half of them are below 60 years old (64.8%) with slightly more female than their male counterparts. Based on the national data, the distribution of age of the haemodialysis patients were comparable as the majority of patients were below than 65 years old, however the gender distribution was contradict from this study as it had been reported that distribution of male patients was higher than female (24th Report of The Malaysian Dialysis and Transplant Registry, 2016).

More than 80% of the patients were married, 14.8% were single while less than 2% had divorced with their partners. A majority of the patients were Malay (87.0%), followed by Chinese (9.3%) and Indian (3.7%). With regards to household income, mean family income was MYR 2656.57 $\pm$ 3802.64, varied widely from MYR 150 to 20000. More than 80% of the patients were in the B40 category (<MYR5000), five were in the M40 (MYR5000-10000) and the other three were in the category of T20 (>MYR10000) (Department of Statistics Malaysia Official Portal, 2020).

For the educational level, half of them had secondary education, followed by approximately one-third with tertiary education while the remaining with either primary (14.8%) or no formal education (1.9%). These findings were reasonable as most of the population in this country had educational background at secondary level (Malaysia | UNESCO

UIS, n.d.). Table 4.1 illustrates the distribution of patients according to socio-demographic characteristics.

Table 4.1: Socio-demographic characteristics of patients ($n = 54$)

Variables	n (%)	Mean $\pm$ SD
Age (years old)		54 $\pm$ 11
<60	35 (64.8)	
$\geq$ 60	19 (35.2)	
Sex		
Male	26 (48.1)	
Female	28 (51.9)	
Ethnicity		
Malay	47 (87.0)	
Chinese	5 (9.3)	
Indian	2 (3.7)	
Marital Status		
Single	8 (14.8)	
Married	45 (83.3)	
Divorced	1 (1.9)	
Educational Level		
No formal education	1 (1.9)	
Primary education	8 (14.8)	
Secondary Education	27 (50.0)	
Tertiary Education	17 (31.5)	
Household Income		2656.57 $\pm$ 3802.64
B40 (<MYR 5000)	46 (85.2)	
M40 (MYR 5000-10000)	5 (9.3)	
T20 (>MYR 10000)	3 (5.6)	

4.2 Social Support

Table 4.2 shows the social supports of patients. The mean scores of family and significant others subscales were comparable while social support from friends was lowest among the subscales. Similar results were reported in previous studies (Alexopoulou et al., 2016; Theodoritsi et al., 2016). More than 70% of the patients perceived high family social support, while only approximately 10% perceived low family social support. Similar findings were observed for social support from significant others. However, such findings were failed to be observed for social support from friends. Approximately half of the patients were perceived low social support from friends, with only one in five of them perceived good social support from friends.

Table 4.2: Distribution of patients according to social supports (n=54)

Subscale	n (%)	Mean ± SD
Total Score (n=84)		58.3 ± 19.5
Family (n=28)		21.5 ± 7.0
Low	6 (11.1)	
Moderate	9 (16.7)	
High	39 (72.2)	
Friends (n=28)		15.0 ± 8.2
Low	25 (46.3)	
Moderate	11 (20.4)	
High	18 (33.3)	
Significant Others (n=28)		21.8 ± 6.7
Low	8 (14.8)	
Moderate	7 (13.0)	
High	39 (72.2)	

4.3 Depression

As shows in Table 4.3, depression score of patients ranged from 0 to 51 out of a possible of 63. The mean and SD of depression of patients was 11.5 ± 10.3 . Based on the data obtained, only two out of 54 patients suffered with depression, there were approximately 30% with moderate depression and the other patients fell under normal category (68.5%). These findings were not in agreement with earlier study whereby the prevalence of the depression among haemodialysis patients was high (83.5%) (Nelson et al., 2016). A local study also found that a majority of the haemodialysis patients were depressed (~80%) (Khan, Khan, Adnan, Sulaiman, & Mushtaq, 2019). Demographic differences for example the composition of the patients may explain the findings discrepancy.

Table 4.3 Distribution of patients according to deepression level ($n=54$)

Variable	n (%)	Mean $\pm$ SD
Depression (n=63)		11.5 ± 10.4
Normal (1-16)	37.8 (68.5)	
Moderate (17-30)	15 (27.8)	
Severe (31-63)	2 (3.7)	

4.4 Physical Activity

As shown in Table 4.4, a majority of the patients had low level of physical activity (55.6%) while another 40.7% were had moderate level of physical activity. These findings were comparable with earlier study where 80% of the HD patients the HD patients had sedentary lifestyle (Araújo Filho et al., 2016). Earlier local study by Wong et al. (2011) reported none of their HD patients had high physical activity level. Haemodialysis patients are prone to have low physical activity level as they may not spent so much time walking or standing (Khan et al., 2019). On the other hand, haemodialysis patients also prone to be inactive due to their nutritional status (Johansen et al., 2000). The dialysis procedure itself may also lead to fatigue and low physical activity among HD patients while the presence of uremia may decrease the skeletal muscle function of the subjects (Johansen et al., 2000). Mental and social changes, accelerated ageing, unemployment, and decreased quality of life may also contribute to lower level of physical activity in dialysis patients (Gariballa & Sinclair, 1998).

Table 4.4 Distribution of the patients according to physical activity level (n=54)

Variable	n (%)	Mean $\pm$ SD
Physical Activity		886.1 $\pm$ 717.8
Low (<600 MET minutes per week)	30 (55.6)	
Moderate (600-2999 MET minutes per week)	22 (40.7)	
High (≥ 3000 MET minutes per week)	2 (3.7)	

4.5 Protein Intake

Based on the Kidney Disease Out-comes Quality Initiative (KDOQI), the requirement of ESRD who undergo haemodialysis treatment is 1.2g/kg body weight (Kim, Kalantar-zadeh, & Kopple, 2013). Adequate intake of protein is important for haemodialysis patients as it can prevent and substantially reversed the CKD-related derangement hence improving the kidney condition (Zha & Qian, 2017). From the 54 haemodialysis patients in this study, most of them did not consume adequate amount of protein needed per day (87.0%) and only 13.0% of them consumed adequate amount of protein based on the recommendation needed for haemodialysis patients. The findings was rational as inadequate energy intake among CKD and ESRD patients cause direct risk of inadequate consumption of protein among them (Zha & Qian, 2017). Low intake of protein was also reported in a recent local study among haemodialysis patients where the mean at 0.73 ± 0.40 g/kg per day (Chan et al., 2019). Protein intake of patients are shown in table 4.5.

Table 4.5 Distribution of the patients according to Protein intake ($n=54$)

Variable	n (%)	Mean $\pm$ SD
Protein Intake		41.9 $\pm$ 18.5
Adequate (1.2g/kg body weight)	7 (13.0)	
Inadequate (<1.2g/kg body weight)	47 (87.0)	

4.6 Frailty

Haemodialysis patients are at high risk of fall and fractures as they tend to be frail and can lead to mortality (Sy & Johansen, 2017). As shown in Table 4.6, frailty was prevalent among the patients with more than half of the patients were frail, with another one-third pre-frail. This finding was concurred with previous studies (Johansen et al., 2016; Lee et al., 2017; Yadla, John, & Mummadi, 2017). As there are increment of frailty status among haemodialysis patients, assessing for frailty should become compulsory at the early stage of CKD (Sy & Johansen, 2017). Moreover, health care providers and dialysis practitioners should take a serious attention for frailty among haemodialysis patients as more elderly patients were started with this treatment (Johansen et al., 2017).

Table 4.6 Distribution of patients according to frailty status ($n=54$)

	n (%)	Mean $\pm$ SD
Frailty		2.81 $\pm$ 1.44
Robust	3 (5.6)	
Pre-Frail	20 (37.0)	
Frail	31 (57.4)	

4.7 Factors Associated with Frailty: Hypothesis Testing

4.7.1 Socio-demographic characteristics

The association between socio-demographic characteristics (continuous variables) such as age and household income with frailty were using Pearson correlation test while, for categorical variables such as sex, ethnicity, marital status and educational level with frailty were determined by Fisher's exact test.

As shown in Table 4.7.1, based on the Pearson correlation test between age and frailty, there was moderate, statistically significant correlation between age and frailty of the haemodialysis patients ($r = 0.421$, $p = 0.002$), indicating the increase of age was associated with higher risk of frailty. This finding was fully supported by previous study as the risk of frailty increased when the age increased (Johansen et al., 2017; Takeuchi, Uchida, Kakio, Okuyama, et al., 2018). Takeuchi et al. reported that there was no haemodialysis patients with frailty below 39 years old however, the percentage of frailty among those in more than 75 years old was higher (32.7%) compared to those in 65-74 years of age and 40-64 years old whereby the percentage were 20.6% and 13.5% respectively (Takeuchi, Uchida, Kakio, Okuyama, et al., 2018). Aging is related to frailty as the process can cause loss of muscles, strength, power, increase the vulnerability and loss of homeostasis and all of these are the components of frailty (Clegg, Young, Iliffe, Rikkert, & Rockwood, 2013).

On the other hand, there were no associations between sex, marital status, educational level, ethnicity and household income with frailty score. These outcomes were not supported by local study as Badrasawi et al. in 2017 reported that ethnicity, educational level and household income were correlated with frailty among Malaysia's population (Badrasawi et al., 2017). There was also a study in Spain, 2011, reported the same findings (Avila et al., 2011). Another local study in 2015 stated that young-old category, female and Malay were prone to

be frail compared to the other age categories and ethnicity and these concluded that gender and ethnicity were related with frailty (Sathasivam et al., 2015). Current study findings were contradicted with the others studies may due to the small sample size.

Hence, there were no association between socio-demographic characteristics with frailty among haemodialysis patients in selected dialysis centres in Selangor except for the age.

Table 4.7.1: Associations between socio-demographic characteristics and frailty ($n=54$)

Variable	Frailty n (%)		<i>r</i>	<i>p</i>
	Non-Frail (n=23)	Frail (n=31)		
Age			0.421 ^a	0.002**
Sex				0.272 ^b
Male	8 (14.9)	18 (33.3)		
Female	15 (27.8)	13 (24.09)		
Marital status				0.501 ^b
Single	4 (7.4)	4 (7.4)		
Married	18 (33.3)	27 (50.0)		
Divorced	1 (1.9)	0 (0.0)		
Ethnicity				0.640 ^b
Malay	22 (40.7)	25 (46.3)		
Chinese	1 (1.9)	4 (7.4)		
Indian	0 (0.0)	2 (3.7)		
Educational level				0.928 ^b
No formal education	0 (0.0)	1 (1.9)		
Primary education	3 (5.5)	5 (9.3)		
Secondary education	11 (20.3)	16 (29.6)		
Tertiary education	9 (16.7)	9 (16.7)		
Household income			0.025 ^a	0.860

^aPearson Correlation Test

^bFisher's Exact Test

**Correlation is significant at $p<0.01$

4.7.2 Social Support

As illustrated in table 4.7.2, by using Pearson correlation test to determine the association of social supports with frailty, total social supports and all subscales of social supports were negatively associated with frailty score. There were few studies were carried out to determine the association between these two variable and the studies summarized that physical and functional comorbidities and together with lack of social support may develop frailty (Anantapong et al., 2020; Generoso, Thaís, Jesus, & Zazzetta, 2017). Anantapong et al. showed in their research, participants who were supported by spouse, family members or partner were uncorrelated with pre-frail nor frail and future frailty among older adults could be predicted by the social support (Anantapong et al., 2020). In Malaysia, based on two studies that had been carried out in 2018, the also reported the same outcomes as the other studies where there were higher prevalence of frail patients among those who were not getting adequate social supports compared to those who lived and supported by their spouses, partner or family members (Asma et al., 2018; Nur Hafizah et al, 2018). However, a study done by Lavra et al. (2018) found that there was no significant correlation between social support and frailty were observed. Thus, based on the current findings, there were no associations between social supports with frailty among haemodialysis patients.

Table 4.7.2: Associations between social supports and frailty ($n=54$)

Variable	Frailty	
	<i>r-value</i>	<i>p-value</i>
Social support	-0.262	0.056
Family	-0.231	0.093
Friends	-0.214	0.121
Significant others	-0.257	0.060

4.7.3 Physical Activity

Table 4.7.3 showed that there was no significant association between physical activity and frailty score among haemodialysis patients as the $p > 0.005$ by using the Fisher's exact test however from the previous study that had been conducted, frailty did associated with low physical activity level (Dantas et al., 2019). Dantas et al. observed that frailty was 50% more frequent among those who were practice sedentary lifestyle and physically inactive. The high distribution of frailty among those who were inactive as they might experience physiology alteration due to the aging process (Dantas et al., 2019). National Health and Nutrition Survey in 2014 also supported the study as it presented that among adults and older adults, frailty was correlated with both sedentary behavior and physical activity level (Andreou & Rockwood, 2014). In the study, the researchers also suggested that risk of the being frail can be lowered by reducing 1 hour/day of sedentary behavior and replaced with 1 hour/day moderate-to-vigorous intensity physical activity (Andreou & Rockwood, 2014). Local study also had been conducted and it had been proven that patients who were low physical activity level tends to be frail (Ahmad & Hairi, 2018). Nevertheless, in this study, there was no association between physical activity and frailty among haemodialys patients.

Table 4.7.3: Association between physical activity and frailty ($n=54$)

Variable	Frailty n (%)		p-value
	Non-frail (n=23)	Frail (n=31)	
Physical Activity			0.159
Low (<600 MET minutes per week)	11 (20.3)	19 (35.2)	
Moderate (600-2999 MET minutes per week)	10 (18.5)	12 (22.2)	
High (≥ 3000 MET minutes per week)	2 (3.8)	0 (0.0)	

4.7.4 Protein Intake

As shown in table 4.7.4, the value of $p < 0.05$ indicated that there was positive association between protein intake with frailty among haemodialysis patients. Different finding was reported by Bollwein et al as they claimed that frailty is not associated with the amount of protein as those who were frail the study prone to uneven distribution of the daily intake of protein compared to those who were non-frail (Bollwein et al., 2010). However, few studies from a systematic review were disagreed with the findings as they found out that there was an association between higher protein intake and risk of getting frail (Lorenzo-lópez et al., 2017). Besides, there was also researchers affirmed that 1g/kg protein intake per day was associated with a lower risk of frailty (Rahi et al., 2016). All in all, the association between the intakes of protein with frailty is still controversial (Rodrigues et al., 2018).

Table 4.7.4: Association between protein intakes and frailty ($n=54$)

Variable	Frailty n (%)		p-value
	Non-frail (n=23)	Frail (n=31)	
Protein Intake			0.032*
Adequate (1.2g/kg body weight)	5 (9.3)	2 (3.7)	
Inadequate (<1.2g/kg body weight)	18 (33.3)	29 (53.7)	

*Correlation is significant at $p < 0.05$

4.7.5 Depression

As tabulated in the table 4.7.5, the association between depressions with frailty score were tested by using Pearson correlation test. Based on the test, there was significant positive association between depression and frailty score among haemodialysis patients ($r=0.398$, $p=0.003$). About 80% of the older adults were diagnosed with depression might increase the risk of getting frail as the depressive symptoms could affected their performance and behavior, reduction of social interactions and reduced functional status thus, these might lead to frailty (Pegorari, M., & Tavares, D., 2014) . They also reported in their meta-analysis study that the depression and frailty were correlated and also associated with the age and gender. Other systematic review study also supported these finding where it had been summed up that older adults who were frail got higher depressive symptoms compared to older adults who were non frail (Vaughan et al., 2015).

Table 4.7.5: Association between depression and frailty ($n=54$)

Variable	Frailty Score	
	r-value	p-value
Depression	0.398	0.003**

** Correlation is significant at $p<0.01$

CHAPTER 5

CONCLUSION, LIMITATION AND RECOMMENDATION

5.1 Conclusion

This cross sectional study determined the prevalence of frailty and its associated factors namely socio-demographic characteristics (age, sex, ethnicity, marital status, educational background and household income), social support, protein intake, physical activity and depression among haemodialysis patients. There was high proportion of HD patients that were frail or pre-frail, which deserve attentions from the relevant authorities as frailty can increase falls and fracture hence, lead to mortality. In this findings, frailty was significantly associated with socio-demographic characteristics (age), protein intake and depression while there were no associations between the other factors which were socio-demographic characteristics (sex, ethnicity, marital status, educational background and household income), social support and physical activity with frailty were observed in this study.

As protein intake was associated with frailty, HD patients should be educated about the importance of adequate daily protein intake. Furthermore, HD patients also should be more concern about their mental health in order to prevent frailty as frailty is associated with depression among HD patients.

More studies need to be done in order to delineate the severity of frailty among dialysis population in Malaysia and improve the understanding about the frailty and its associated factors.

5.2 Limitation

Several limitations should be highlighted in this study in order to improve future research. As this is a cross sectional study, it only can investigate the distribution and association but it could not find out the causal-effect relationship of the data. Moreover, this study only collected at one short period of time.

Next, the result from this study did not represent the whole population of Malaysia or even Selangor as the majority of the patients were Malay participated in this study. In addition, there were only three HD centres that had been selected in this study also made this study could not be generalized to all Malaysia's population.

5.3 Recommendation

There are few suggestions for recommendations for the research in the future and one of them is design of the study should be a prospective cohort study or randomised control trial. This is because these study designs are able to determine the cause and effect of a condition or disease. Secondly, involve more dialysis centres of the patients as the wider range of HD centres are enable the findings to represent the populations of Selangor and Malaysia.

Next, sample size should be increased as it can increase the reliability and the validity of the research findings. A higher sample size will allow a bigger study power.

References

- Abbasi, M. A., Chertow, G. M., & Hall, Y. N. (2010). End-stage renal disease. *BMJ clinical evidence*, 2010, 2002.
- Ahmad, N. S., & Hairi, N. N. (2020). Prevalence , transitions and factors predicting transition between frailty states among rural community-dwelling older adults in Malaysia, 1–10. Ahmad, N. S., Hairi, N. N., Said, M. A., Kamaruzzaman, S. B., Choo, W. Y., Hairi, F., . . . Bulgiba, A. (2018). Prevalence, transitions and factors predicting transition between frailty states among rural community-dwelling older adults in Malaysia. *Plos One*, 13(11). doi:10.1371/journal.pone.0206445
- Alexopoulou, M., Giannakopoulou, N., Komna, E., Alikari, V., Toulia, G., & Polikandrioti, and. (2016). The Effect of Perceived Social Support on Hemodialysis Patients' Quality of Life. *Materia Socio Medica*, 28(5), 338. <https://doi.org/10.5455/msm.2016.28.338-342>
- Anantapong, K., Wiwattanaworaset, P., & Sriplung, H. (2020). Association between Social Support and Frailty among Older People with Depressive Disorders. *Clinical Gerontologist*, 00(00), 1–11. <https://doi.org/10.1080/07317115.2020.1728002>
- Andreou, P., & Rockwood, K. (2014). physical activity and frailty in NHANES cohorts. *Maturitas*. <https://doi.org/10.1016/j.maturitas.2014.11.010>
- Araújo Filho, J. C. de, Amorim, C. T. de, Brito, A. C. N. de L., Oliveira, D. S. de, Lemos, A., & Marinho, P. É. de M. (2016). Physical activity level of patients on hemodialysis: a cross-sectional study Nível de atividade física de pacientes em hemodiálise: um estudo de corte transversal. *Physiotherapy and Research Fisioterapia e Pesquisa*, 23(3), 234–240. <https://doi.org/10.1590/1809-2950/14160723032016>

Arora, P., Editor, C., & Batuman, V. (2019). Chronic Kidney Disease, 1–37.

Asma, F., Hamidin, M., Nur, S., Adznam, A., Ibrahim, Z., Chan, Y. M., ... Aziz, A. (2018).

Prevalence of frailty syndrome and its associated factors among community- dwelling elderly in East Coast of Peninsular Malaysia.

<https://doi.org/10.1177/2050312118775581>

Avila, G. G., Andres, M. S. A., La, M. D. E. L. O. S. A. D. E., Lanza, T., Aparicio, M. V. E., Aparicio, S. H., ... Reus, M. G. (2011). The Prevalence of Frailty Syndrome in an Older Population from Spain. *The Toledo Study for Healthy Aging*, 15(10), 852–856.

Badrasawi, M., Shahar, S., Kaur, D., & Singh, A. (2017). Risk Factors of Frailty Among Multi-Ethnic Malaysian Older Adults, 11, 154–160.

Beck, I., & Steer, R. A. (1988). Psychometric Properties of the Beck Depression Inventory : Twenty-Five Years of Evaluation, 8, 77–100.

Blaum CS, Xue QL, Michelon E, et al. The association between obesity and the frailty syndrome in older women: The Women's Health and Aging Studies. *J Am Geriatr Soc* 2005;53:927e934.

Blodgett, J., Theou, O., Kirkland, S., Andreou, P., & Rockwood, K. (2015). Maturitas The association between sedentary behaviour , moderate – vigorous physical activity and frailty in NHANES cohorts. *Maturitas*, 80(2), 187–191.

<https://doi.org/10.1016/j.maturitas.2014.11.010>

Bollwein, J., Volkert, D., Diekmann, R., Kaiser, M. J., Uter, W., Vidal, K., ... Bauer, J. M. (2010). Nutritional Status According To The Mini Nutritional Assessment (Mna ®) And Frailty In Community Dwelling Older Persons : A Close Relationship, (August

2009).

Chang M, Phillips C, Coppin AK, et al. An association between incident disability and depressive symptoms over 3 years of follow-up among older women. *Aging Clin Exp Res* 2009;21:191e197.

Chang SS, Weiss CO, Xue QL, Fried LP. Patterns of comorbid inflammatory diseases in frail older women: The Women's Health and Aging Studies I and II. *J Gerontol A Biol Sci Med Sci* 2010;65:407e413.

Chen CY, Wu SC, Chen LJ, Lue BH. The prevalence of subjective frailty and factors associated with frailty in Taiwan. *Arch Gerontol Geriatr* 2010;50:S43eS47.

Chevalier, S., Gougeon, R., Nayar, K., & Morais, J. A. (2019). Frailty amplifies the effects of aging on protein metabolism : role of protein intake , 1–28.

Clegg, A., Young, J., Iliff, S., Rikkert, M. O., & Rockwood, K. (2013). Frailty in elderly people, 381. [https://doi.org/10.1016/S0140-6736\(12\)62167-9](https://doi.org/10.1016/S0140-6736(12)62167-9)

Clegg, A., Young, J., Iliffe, S., Rikkert, M. O., & Rockwood, K. (2013). Frailty in elderly people. In *The Lancet* (Vol. 381, pp. 752–762). Lancet Publishing Group. [https://doi.org/10.1016/S0140-6736\(12\)62167-9](https://doi.org/10.1016/S0140-6736(12)62167-9)

Crentsil, V. (2020). Mechanistic contribution of carnitine deficiency to geriatric frailty, 1–2.

Dantas, V., Tribess, S., Meneguci, J., & Sasaki, J. E. (2019). Association between frailty and the combination of physical activity level and sedentary behavior in older adults, 1–6.

Department of Statistic Malaysia. (2015). Status of surveying and mapping in Malaysia.

Nineteenth United Nations Regional Cartographic Conference for Asia and the Pacific,

6, 13.

Department of Statistics Malaysia Official Portal. (n.d.). Retrieved July 17, 2020, from

https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=120&bul_id=TU00TmRhQ1N5TUxHVWN0T2VjbXJYZz09&menu_id=amVoWU54UTl0a21NWmdhMjFMMWcyZz09

Eeles EM, White SV, O'Mahony SM, Bayer AJ, Hubbard RE. (2012). The impact of frailty and delirium on mortality in older inpatients. *Age Ageing*, 41: 412–416.

Fatin, N., Rivan, M., Shahar, S., Rajab, N. F., Kaur, D., Singh, A., & Din, N. C. (2020). Cognitive frailty among Malaysian older adults : baseline findings from the LRGS TUA cohort study, 1343–1352. <https://doi.org/10.2147/CIA.S211027>

Gariballa SE & Sinclair AJ (1998). Nutrition, aging and ill health. *Br J Nutr* 80: 7–23.

Generoso, F. K., Thaís, I., Jesus, M. De, & Zazzetta, M. S. (2017). Evaluation of frailty and social support of the elderly in the context of social vulnerability : a study in rural area, 4(3), 407–409. <https://doi.org/10.15406/ncoaj.2017.04.00107>

Gomes, E. P., Reboredo, M. M., Carvalho, E. V., Teixeira, D. R., Carvalho, L. F. C. D. O., Filho, G. F. F., ... Pinheiro, B. D. V. (2015). Physical Activity in Hemodialysis Patients Measured by Triaxial Accelerometer. *BioMed Research International*, 2015. <https://doi.org/10.1155/2015/645645>

Hs, W. (2016). 24 TH REPORT OF THE MALAYSIAN DIALYSIS & TRANSPLANT REGISTRY.

Hulley, S. B., Cummings, S. R., Browner, W. S., Grady, D. G., & Newman, T. B. (2013). *Designing clinical research: an epidemiologic approach. Optometry Vision Science.*

<https://doi.org/10.1097/00006982-199010000-00024>

Jackson-koku, G. (2016). Beck Depression Inventory, 63, 174–175.

<https://doi.org/10.1093/occmed/kqv087>

Johansen KL, Chertow GM, Ng AV, Mulligan K, Carey S & Kent-Braun JA (2000). Physical activity levels in patients on hemodialysis and healthy controls. *Kidney Int* 57: 2564–2570

Johansen, K. L., Chertow, G. M., Ng, A. V., Mulligan, K., Carey, S., Schoenfeld, P. Y., & Kent-Braun, J. A. (2000). Physical activity levels in patients on hemodialysis and healthy sedentary controls. *Kidney International*, 57(6), 2564–2570.

<https://doi.org/10.1046/j.1523-1755.2000.00116.x>

Johansen, K. L., Dalrymple, L. S., Delgado, C., Chertow, G. M., Segal, M. R., Chiang, J., ... Kaysen, G. A. (2017). Factors associated with frailty and its trajectory among patients on hemodialysis. *Clinical Journal of the American Society of Nephrology*, 12(7), 1100–1108. <https://doi.org/10.2215/CJN.12131116>

Johansen, K. L., Dalrymple, L. S., Glidden, D., Delgado, C., Kaysen, G. A., Grimes, B., & Chertow, G. M. (2016). Association of performance-based and self-reported function-based definitions of frailty with mortality among patients receiving hemodialysis. *Clinical Journal of the American Society of Nephrology*, 11(4), 626–632.

<https://doi.org/10.2215/CJN.03710415>

Jürschik P, Nunin C, Botigué T, et al. Prevalence of frailty and factors associated with frailty in the elderly population of Lleida, Spain: The FRALLE survey. *Arch Gerontol Geriatr* 2012;55:625e631.

- Khan, A., Khan, A. H., Adnan, A. S., Sulaiman, S. A. S., & Mushtaq, S. (2019). Prevalence and predictors of depression among hemodialysis patients: A prospective follow-up study. *BMC Public Health*, 19(1), 531. <https://doi.org/10.1186/s12889-019-6796-z>
- Kim, J. C., Kalantar-zadeh, K., & Kopple, J. D. (2013). Frailty and Protein-Energy Wasting in Elderly Patients with End Stage Kidney Disease, 337–351. <https://doi.org/10.1681/ASN.2012010047>
- Kim, S., Kim, M., Jung, H., & Won, C. (2019). Development of a Frailty Phenotype Questionnaire for Use in Screening Community-Dwelling Older Adults. *Journal of the American Medical Directors Association*, 1–5. <https://doi.org/10.1016/j.jamda.2019.08.028>
- Kojima G, Liljas AEM, Iliffe S. (2019). Frailty syndrome: implications and challenges for health care policy. *Risk Manag Health Policy*, 12: 23–30.
- Labra, C. De, Maseda, A., Lorenzo-lópez, L., López-lópez, R., Buján, A., Rodríguez-villamil, J. L., & Millán-calenti, J. C. (2018). Social factors and quality of life aspects on frailty syndrome in community-dwelling older adults : the VERISAÚDE study, 1–9.
- Lee, S. (2017). The Prevalence , Association , and Clinical, 27(2), 106–112.
- Lee, S. Y., Yang, D. H., Hwang, E., Kang, S. H., Park, S. H., Kim, T. W., ... Kim, J. C. (2017). The Prevalence, Association, and Clinical Outcomes of Frailty in Maintenance Dialysis Patients. *Journal of Renal Nutrition*, 27(2), 106–112. <https://doi.org/10.1053/j.jrn.2016.11.003>
- Lorenzo-lópez, L., Maseda, A., Labra, C. De, Regueiro-folgueira, L., Rodríguez-villamil, J. L., & Millán-calenti, J. C. (2017). Nutritional determinants of frailty in older adults : A

systematic review, 1–13. <https://doi.org/10.1186/s12877-017-0496-2>

Malaysia | UNESCO UIS. (n.d.). Retrieved July 17, 2020, from

<http://uis.unesco.org/en/country/my>

Mezuk, B., Edwards, L., Lohman, M., Choi, M., & Lapane, K. (2012). Depression and frailty in later life : a synthetic review, 879–892. <https://doi.org/10.1002/gps.2807>

National Kidney Foundation. (2000). K/DOQI nutrition in chronic renal failure. *American Journal of Kidney Diseases*, 35(No 6 (Suppl 2)), 1–141.

<https://doi.org/10.1053/ajkd.2001.20748>

Nelson, V., Gopalakrishnan, S., Simon, S., Babu, V., Vikraman, V., Abraham, S., ...

Medical, T. (2008). Depression Among Dialysis Patients, 40(2), 34–37.

Nitta, K., Hanafusa, N., & Tsuchiya, K. (2017). Frailty and mortality among dialysis patients, 1–6. <https://doi.org/10.1186/s41100-017-0122-y>

Nixon, A. C., Bampouras, T. M., Pendleton, N., Woywodt, A., Mitra, S., & Dhaygude, A.

(2018). Frailty and chronic kidney disease : current evidence and continuing uncertainties, (January), 1–10. <https://doi.org/10.1093/ckj/sfx134>

Nolan, M. T. (2014). Frailty And Its Association With Rehabilitation Outcomes : An Irish Prospective Cohort Study Of A Post-Acute Older Population.

Asma, M. H. Nurhafizah et al., (2018). Association of Socio-Demographic, Psychosocial and Functional Factors with Frailty Syndrome among Community-Dwelling Elderly in Kuala Nerus, Terengganu., *International Journal of Public Health and Clinical Sciences* 5(5), 176–193. doi:10.32827/ijphcs.5.5.176

- Pegorari, M., & Tavares, D. (2014). Factors associated with the frailty syndrome in elderly individuals living in the urban region. *Revista Latino-Americana de Enfermagem*, 22(5), 874–882.
- Perkovic, V., Cass, A., Patel, A. A., Suriyawongpaisal, P., Barzi, F., Chadban, S., & Macmahon, S. (2008). High prevalence of chronic kidney disease in Thailand. *Kidney International*, 73(4), 473–479. <https://doi.org/10.1038/sj.ki.5002701>
- Pozo-cruz, B. (2020). Frailty is associated with objectively assessed sedentary behaviour patterns in older adults : Evidence from the Toledo Study for Healthy Aging (TSHA), 2–7.
- Rahi, B., Colombet, Z., Harmand, M. G., Dartigues, J., Boirie, Y., & Letenneur, L. (2016). Higher Protein but Not Energy Intake Is Associated With a Lower Prevalence of Frailty Among Community-Dwelling Older Adults in the French Three-City Cohort. *Journal of the American Medical Directors Association*, 17(7), 672.e7-672.e11. <https://doi.org/10.1016/j.jamda.2016.05.005>
- Roberto, J., Fhon, S., Aparecida, R., Rodrigues, P., & Ferreira, J. L. (2018). Factors associated with frailty in older adults : a longitudinal study, 1–8.
- Rodrigues, B., Uchida, M., & Marzetti, E. (2018). Low Protein Intake Is Associated with Frailty in Older Adults : A Systematic Review and Meta-Analysis of Observational Studies, 1–14. <https://doi.org/10.3390/nu10091334>
- Sathasivam, J., Kamaruzzaman, S. B., Hairi, F., & Wan, N. C. (2015). Frail Elders in an Urban District Setting in Malaysia : Multidimensional Frailty and Its Correlates. <https://doi.org/10.1177/1010539515583332>

Semba RD, Bartali B, Zhou J, et al. Low serum micronutrient concentrations predict frailty among older women living in the community. *J Gerontol A Biol Sci Med Sci* 2006;61:594e599.

Strawbridge WJ, Shema SJ, Balfour JL, et al. Antecedents of frailty over three decades in an older cohort. *J Gerontol B Psychol Sci Soc Sci* 1998;53:S9eS16.

Sy, J. (2019). Depressive symptoms , frailty , and mortality among dialysis patients, 1–8. *Hemodialysis International*, 23(2), 239-246. <https://doi.org/10.1111/hdi.12747>

Sy, J., & Johansen, K. L. (2017, November 1). The impact of frailty on outcomes in dialysis. *Current Opinion in Nephrology and Hypertension*. Lippincott Williams and Wilkins. <https://doi.org/10.1097/MNH.0000000000000364>

Syddall H, Roberts HC, Evandrou M, et al. Prevalence and correlates of frailty among community-dwelling older men and women: Findings from the Hertfordshire Cohort Study. *Age Ageing* 2010;39:197e203.

Takeuchi, H., Uchida, H. A., Kakio, Y., & Okuyama, Y. (2018). The Prevalence of Frailty and its Associated Factors in Japanese Hemodialysis Patients, 9(2), 2–5.

Takeuchi, H., Uchida, H. A., Kakio, Y., Okuyama, Y., Okuyama, M., Umebayashi, R., ... Wada, J. (2018). The prevalence of frailty and its associated factors in Japanese hemodialysis patients. *Aging and Disease*, 9(2), 192–207. <https://doi.org/10.14336/AD.2017.0429>

Tennankore, K. (2019). Frailty Screening in Chronic Kidney Disease : Current Perspectives.

Theodoritsi, A., Aravantinou, M. E., Gravani, V., Bourtsi, E., Vasilopoulou, C., Theofilou, P., & Polikandrioti, M. (2016). Factors associated with the social support of

- hemodialysis patients. *Iranian Journal of Public Health*, 45(10), 1261–1269. Retrieved from <http://ijph.tums.ac.ir>
- Uchmanowicz, I., & Anxiety, H. (2019). The relationship between frailty , anxiety and depression , and health-related quality of life in elderly patients with heart failure, 1–5.
- United States Renal Data System. (2012). Chapter 12: international comparisons. *Annual Data Report: International Comparisons*, 341–352.
- United States Renal Data System. (2017). Chapter 11: international comparisons. *Annual Data Report: International Comparisons*, 2.
- Vaughan, L., Corbin, A. L., & Goveas, J. S. (2015). Depression and frailty in later life : a systematic review, 1947–1958.
- Walter M. Bortz, II, A Conceptual Framework of Frailty: A Review, *The Journals of Gerontology: Series A*, Volume 57, Issue 5, 1 May 2002, Pages M283–M288
- Wang C, Song X, Mitnitski A, et al. Gender differences in the relationship between smoking and frailty: Results from the Beijing Longitudinal Study of Aging. *J Gerontol A Biol Sci Med Sci* 2013;68:338e346.
- with the frailty syndrome in elderly individuals living in the urban region. *Revista Latino-Americana de Enfermagem*, 22(5), 874–882.
- Wong SW, Chan YM, Lim TS. Correlates of physical activity level among hemodialysis patients in Selangor, Malaysia. *Malays J Nutr*. 2011;17(3):277-286.
- Wongpakaran, T., Wongpakaran, N., & Ruktrakul, R. (2019). Reliability and Validity of the Multidimensional Scale of Perceived Social Support (MSPSS): Thai Version, 161–166.

<https://doi.org/10.2174/1745017901107010161>

Woo J, Goggins W, Sham A, Ho SC. Social determinants of frailty. *Gerontology* 2005;51:402e408.

Woo, J., Goggins, W., Sham, A., & Ho, S. C. (2005). Social Determinants of Frailty, 402–408. <https://doi.org/10.1159/000088705>

Yadla, M., John, J. P., & Mummadi, M. (2017). A study of clinical assessment of frailty in patients on maintenance hemodialysis supported by cashless government scheme. *Saudi Journal of Kidney Diseases and Transplantation : An Official Publication of the Saudi Center for Organ Transplantation, Saudi Arabia*, 28(1), 15–22. <https://doi.org/10.4103/1319-2442.198102>

Chan, Mohd Shariff, Z., Lim Thiam Seong, C., & Bak Leong, G. (2019). *Factors Associated With Poor Nutritional Status Among Hemodialysis Patients in Malaysia*. *Malaysian Journal of Medicine and Health Sciences* (Vol. 15).

Zemaitis, M. R., Foris, L. A., Chandra, S., Bashir, K., Health, C., & Medical, B. (2019). Uremia Pathophysiology, 1–7.

Zha, Y., & Qian, Q. (2017, March 1). Protein nutrition and malnutrition in CKD and ESRD. *Nutrients*. MDPI AG. <https://doi.org/10.3390/nu9030208>

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*. https://doi.org/10.1207/s15327752jpa5201_2

APPENDICES

Appendix 1

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

Date: 18 Jun 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 **'Frailty and Its Associated Factors Among Hemodialysis Patients in Selected Dialysis Center in Selangor'** 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-2020-162**

Thank you.

Yours faithfully,

Prof. Dr. Zamberi Sekawi

Chair

Ethics Committee for Research Involving Human Subjects Universiti Putra Malaysia



Appendix 2

Appendix 3

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



FORM 2.4: RESPONDENT'S INFORMATION SHEET AND INFORMED CONSENT FORM

Please read the following information carefully and do not hesitate to discuss any questions you may have with the researcher.

1. STUDY TITLE :

Frailty and its associated factors among haemodialysis patients in selected dialysis centres in Selangor, Malaysia.

2. INTRODUCTION:

Chronic kidney disease (CKD) is an irreversible and progressive renal impairment that will eventually lead to end-stage renal disease (ESRD). ESRD can be severe enough to be fatal in that absence of dialysis or renal transplantation. ESRD is the stage 5 or terminal stage of CKD, where the individual is with an estimated glomerular filtration rate (GFR) less than 15ml per minute per 1.73 m² body surface area, at which body is unable to excrete nitrogenous waste for example urea at this stage, leading to several complications such as hypertension, atherosclerosis, valvular stenosis and insufficiency, chronic heart failure, and angina. In Malaysia, prevalence rates of ESRD patients increased rapidly since 2011 and keep increasing in 2016. Haemodialysis (HD), peritoneal dialysis (PD) and kidney transplantation are the available treatments for ESRD patients, with the most predominant approach treatment is HD. However, it may cause frailty among the patients. The aim of this study to determine frailty and its associated factors among haemodialysis patients in selected dialysis centres in Selangor, Malaysia.

3. WHAT WILL YOU HAVE TO DO?

You have to use haemodialysis as a treatment at least withing 6 months and at least 18 years old male or female. If you agree to participate in this study, you will be interview and required to answer questionnaire given. You will be interviewed questions which related to your socio-demographic characteristics, dietary intake (2 days diet recall), social support, depression, physical activity and some questions regarding frailty.

4. WHO SHOULD NOT PARTICIPATE IN THE STUDY?

You should not participate in this study if you are non-Malaysian, below 18 years old or presense with any infectious diseases.

5. WHAT WILL BE THE BENEFITS OF THE STUDY:

(a) TO YOU AS THE SUBJECT?

You will get to know some informations whether you are frail, pre-frail or robust and its associated factors based on the scoring from the questionnaire provided.

(b) TO THE INVESTIGATOR?

The outcomes from this study will be analysed in order to find out what are the associated factors of frailty among haemodialysis patients. Some interventions or awareness may be done by relevant authorities from these findings.

6. WHAT ARE THE POSSIBLE RISKS?

There is no possible risk from this study as it only involves completing all the questions from the questionnaire provided.

7. WILL THE INFORMATION THAT YOU PROVIDE AND YOUR IDENTITY REMAIN CONFIDENTIAL?

All of the information from this study is only for research purposes and will be strictly confidential. All the data will not be revealed without your consent.

8. WHO SHOULD YOU CONTACT IF YOU HAVE ADDITIONAL QUESTIONS DURING THE COURSE OF THE RESEARCH?

If you have any questions about this study, you can directly contact the researcher of this study, Mr. Abdullah Abd Wahab at 013-9766243 (email: 192379@student.upm.edu.my) or supervisor of this study, Professor Dr. Chan Yoke Mun at 03-97692433 (email: cym@upm.edu.my)

Please initial here if you have read and understood the contents of this page_____

9. CONSENT

I Identity Card No.
address.....
.....hereby voluntarily agree to take part in the research stated
above *(clinical /drug trial/video recording/ focus group/interview-based/ questionnaire-based).

I have been informed about the nature of the research in terms of methodology, possible adverse effects and complications (as written in the Respondent's Information Sheet). I understand that I have the right to withdraw from this research at any time without giving any reason whatsoever. I also understand that this study is confidential and all information provided with regard to my identity will remain private and confidential.

I* wish / do not wish to know the results related to my participation in the research

I agree/do not agree that the images/photos/video recordings/voice recordings related to me be used in any form of publication or presentation (if applicable)

* delete where necessary

Signature Signature
(Respondent) (Witness)

Date : Name :
I/C No. :

I confirm that I have explained to the respondent the nature and purpose of the above-mentioned research.

Date Signature
(Researcher)

**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

Kelemahan badan dan faktor-faktor yang berkaitan di kalangan pesakit hemodialisis di pusat dialisis yang dipilih di Selangor, Malaysia.

2. PENGENALAN

Penyakit buah pinggang kronik (CKD) adalah kemerosotan renal yang tidak dapat dipulihkan dan progresif yang akhirnya akan membawa kepada penyakit buah pinggang peringkat akhir (ESRD). ESRD boleh menjadi sangat teruk mengakibatkan kematian tanpa dialisis atau pemindahan buah pinggang. ESRD adalah tahap 5 atau peringkat terminal CKD, di mana individu itu mempunyai dan mengangalkan kadar penapisan glomerular (GFR) kurang daripada 15ml seminit setiap kawasan permukaan badan 1.73 m², di mana badan tidak dapat mengeluarkan sisa nitrogenous misalnya urea , menyebabkan beberapa komplikasi seperti hipertensi, aterosklerosis, stenosis valvular dan kegagalan jantung kronik, dan angina. Di Malaysia, kadar prevalensi pesakit ESRD meningkat dengan pesat sejak 2011 dan terus meningkat pada tahun 2016. Hemodialisis (HD), dialisis peritoneal (PD) dan pemindahan buah pinggang adalah rawatan yang tersedia untuk pesakit ESRD, dengan rawatan pendekatan yang paling utama adalah HD. Walau bagaimanapun, ia boleh menyebabkan kelemahan di kalangan pesakit. Tujuan kajian ini untuk menentukan kelemahan dan faktor-faktor yang berkaitan di kalangan pesakit hemodialisis di pusat dialisis terpilih di Selangor, Malaysia.

3. APAKAH YANG PERLU ANDA LAKUKAN?

Anda perlu menggunakan heamodialysis sebagai rawatan sekurang-kurangnya selama 6 bulan dan sekurang-kurangnya berumur 18 tahun lelaki atau perempuan. Sekiranya anda bersetuju untuk mengambil bahagian dalam kajian ini, anda akan ditemubual dan dikehendaki untuk menjawab soal selidik yang diberikan. Anda akan ditemuramah soalan yang berkaitan dengan ciri sosio-demografi anda, pengambilan makanan (2 hari pemulihan diet), sokongan sosial, kemurungan, aktiviti fizikal dan beberapa soalan mengenai kelemahan.

4. SIAPA YANG TIDAK BOLEH MENYERTA KAJIAN INI?

Anda tidak sepatutnya mengambil bahagian dalam kajian ini jika anda bukan warganegara, berumur kurang daripada 18 tahun atau mempunyai sebarang penyakit berjangkit.

5. APAKAH FAEDAH MENYERTAI KAJIAN INI?

a) KEPADA ANDA SEBAGAI PESERTA?

Anda akan dapat mengetahui beberapa maklumat sama ada anda lemah, pra-lemah atau teguh dan faktor-faktor yang berkaitan berdasarkan pemarkahan dari soal selidik yang disediakan.

b) KEPADA PENYELIDIK?

Hasil dari kajian ini akan dianalisis untuk mengetahui faktor-faktor yang berkaitan dengan kelemahan di kalangan pesakit hemodialisis. Langkah-langkah pencegahan atau kesedaran boleh dilakukan oleh pihak tertentu dari penemuan ini.

6. ADAKAH IA BERISIKO?

Tiada sebarang risiko mungkin timbul daripada kajian ini kerana hanya melibatkan soalan dari soal selidik yang disediakan.

7. ADAKAH MAKLUMAT DAN IDENTITI SAYA KEKAL RAHSIA?

Semua maklumat dari kajian ini hanya untuk tujuan penyelidikan dan sangat sulit. Semua data tidak akan disebarikan tanpa persetujuan anda.

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

Sekiranya anda mempunyai sebarang soalan mengenai kajian ini, anda boleh menghubungi wakil penyelidik ini, Encik Abdullah Abd Wahab di 013-9766243 (e-mel: 192379@student.upm.edu.my) atau penyelia kajian ini, Profesor Dr. Chan Yoke Mun di 03-97692433 (e-mel: cym@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 Helaian 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 imei/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)

Appendix 4



**FACULTY OF MEDICINE AND HEALTH SCIENCES
DEPARTMENT OF NUTRITION AND DIETETICS**

Questionnaire Form

Research Title:

Frailty and its associated factors among haemodialysis patients in selected dialysis centres

Researcher's Name: Abdullah bin Abd Wahab

Matric Number : 192379

Supervisor's Name: Professor Dr. Chan Yoke Mun

Instruction:

This study is conducted for academic purpose. All information will be kept private and confidential. Thank you for your cooperation in answering this questionnaire.

Arahan: Kajian ini dijalankan untuk kegunaan akademik sahaja. Semua maklumat dalam kajian ini akan disimpan secara sulit. Terima kasih kerana menjawab borang ini.

1. Age / Umur : _____ years old / tahun

2. Date of Birth / Tarikh lahir: _____ (dd/mm/yyyy)

3. Sex / Jantina:

☐ Male / Lelaki

☐ Female / Perempuan

4. Ethnicity / Bangsa:

☐ Malay / Melayu

☐ Chinese / Cina

☐ Indian / India

☐ Others, please specify / Lain-lain, sila nyatakan: _____

5. Marital Status / Status Perkahwinan:

☐ Single / Bujang

☐ Married / Berkahwin

☐ Divorce / Berceraai

6. Educational Level / Latar belakang pendidikan:

☐ No formal education / Tiada Pendidikan Formal

☐ Primary Education / Sekolah Rendah

☐ Secondary Education / Sekolah Menengah

☐ Tertiary (Diploma/ Degree/ Master/ PhD) / Pendidikan IPTA, Diploma ke atas

☐ others, please specify / Lain-lain, sila nyatakan _____

7. Are you working currently/ *Adakah anda bekerja sekarang?*

☐ Yes / *Ya*

☐ No / *Tidak*

8. Occupation / *Pekerjaan*: _____ (Part Time / *Sambilan*) (Full Time / *Sepenuh masa*)

9. Monthly household income / *Pendapatan bulanan isi rumah*: RM _____

10. How long had you been on hemodialysis / *Berapa lamakah anda telah menerima rawatan hemodialysis?* _____ month(s)/year(s) / *bulan/tahun*

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE / SOAL SELIDIK AKTIVITI FIZIKAL ANTARABANGSA

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

*Kami berminat untuk mengetahui aktiviti fizikal yang dilakukan oleh masyarakat umum dalam kehidupan harian mereka. Soalan-soalan berikut akan menyoal anda tentang jumlah masa yang anda gunakan untuk berada dalam keadaan aktif secara fizikal dalam tempoh **7 hari yang lepas ini**. Sila jawab soalan-soalan ini walaupun anda berpendapat bahawa anda bukanlah seorang yang aktif. Sila fikirkan tentang aktiviti-aktiviti yang anda lakukan di tempat kerja, di rumah dan kawasan halaman, untuk bergerak dari satu tempat ke tempat yang lain, dan pada waktu lapang untuk rekreasi, senaman atau bersukan.*

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

*Fikirkan tentang semua aktiviti fizikal **berat** yang anda telah lakukan dalam tempoh **7 hari yang lepas ini**. Aktiviti fizikal **berat** adalah aktiviti yang menggunakan daya tenaga fizikal yang kuat dan membuat anda bernafas jauh lebih kuat daripada biasa. Fikirkan hanya tentang aktiviti-aktiviti fizikal yang anda telah lakukan selama sekurang-kurangnya 10 minit pada sesuatu masa.*

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____ **days per week**

☐ No vigorous physical activities → **Skip to question 3**

1. Dalam tempoh 7 **hari yang lepas ini**, berapa harikah anda telah melakukan aktiviti fizikal berat, contohnya mengangkat barang berat, mencangkul, senaman aerobik atau berbasikal laju?

_____ **hari seminggu**

☐ Tiada aktiviti fizikal berat → **Lompat ke soalan 3**

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

2. Berapakah masa yang anda biasa gunakan untuk melakukan aktiviti fizikal **berat** pada salah satu daripada hari berkenaan?

_____ **jam** _____ **minit sehari**

☐ Tidak tahu / Tidak pasti

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

*Fikirkan tentang semua aktiviti fizikal **sederhana** yang anda telah lakukan dalam tempoh 7 hari yang lepas ini. Aktiviti fizikal **sederhana** adalah aktiviti yang menggunakan daya tenaga fizikal yang sederhana dan membuatkan anda bernafas agak lebih kuat daripada biasa. Fikirkan hanya tentang aktiviti-aktiviti fizikal yang anda telah lakukan selama sekurang-kurangnya 10 minit pada sesuatu masa.*

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ **days per week**

☐ No moderate physical activities → **Skip to question 5**

*3. Dalam tempoh 7 hari yang lepas ini, berapa harikah anda telah melakukan aktiviti fizikal **sederhana**, contohnya mengangkat muatan ringan, mengelap lantai, berbasikal pada kelajuan biasa, atau bermain badminton beregu? Ini tidak termasuk berjalan kaki.*

_____ **hari seminggu**

☐ Tiada aktiviti fizikal sederhana → **Lompat ke soalan 5**

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

4. Berapakah masa yang anda biasa gunakan untuk melakukan aktiviti fizikal sederhana pada salah satu daripada hari berkenaan?

_____jam _____minit sehari

☐ Tidak tahu / Tidak pasti

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

Fikirkan tentang masa yang anda telah gunakan untuk **berjalan kaki** dalam tempoh **7 hari yang lepas ini**. Masa ini merangkumi berjalan kaki di tempat kerja dan di rumah, berjalan kaki dari satu tempat ke tempat yang lain, dan berjalan kaki semata-mata untuk rekreasi, bersukan, bersenam atau pada masa lapang.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ days per week

☐ No walking → **Skip to question 7**

5. Dalam tempoh **7 hari yang lepas ini**, berapa harikah anda telah **berjalan kaki** selama sekurang-kurangnya 10 minit pada sesuatu masa?

_____hari seminggu

☐ Tiada berjalan kaki → **Lompat ke soalan 7**

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

6. Berapakah masa yang anda biasa gunakan untuk **berjalan kaki** pada salah satu daripada hari berkenaan?

_____ **jam** _____ **minit sehari**

☐ Tidak tahu / Tidak pasti

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

Soalan terakhir ini adalah berkaitan masa yang anda telah gunakan untuk **duduk** pada hari-hari bekerja dalam tempoh **7 hari yang lepas ini**. Masukkan masa yang di habiskan duduk di tempat kerja, di rumah, sewaktu belajar dan di masa lapang. Masa ini juga merangkumi waktu yang di habiskan duduk di meja, menziarahi kawan-kawan, membaca, atau duduk atau baring sambil menonton televisyen.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

7. Dalam tempoh **7 hari yang lepas ini**, berapakah masa yang anda telah gunakan untuk **duduk** pada **sesuatu hari bekerja**?

_____ **jam** _____ **minit sehari**

☐ Tidak tahu / Tidak pasti

SOCIAL SUPPORT (Multidimensional Scale of Perceived Social Support (MSPSS))

We are interested in knowing how you feel on the social support you received. I will read to you several statements, kindly let us know how you feel about each statement by indicating either you **Very Strongly Disagree, Strongly Disagree, Mildly Disagree, Neutral, Mildly Agree, Strongly Agree or Very Strongly Agree.**

Kami berminat untuk mengetahui bagaimana perasaan anda terhadap sokongan sosial yang anda terima. Kami akan memberikan beberapa kenyataan, sila beritahu kami bagaimana perasaan anda tentang setiap pernyataan dengan menunjukkan sama ada anda **Sangat Tidak Bersetuju, Tidak Bersetuju, Agak Tidak Bersetuju, Neutral, Agak Bersetuju, Bersetuju, Sangat Bersetuju.**

	Very Strongly Disagree/ Sangat Tidak Bersetuju	Strongly Disagree/ Tidak Bersetuju	Mildly Disagree/ Agak Tidak Bersetuju	Neutral/ Neutral	Mildly Agree/ Agak Bersetuju	Strongly Agree/ Bersetuju	Very Strongly Agree/ Sangat Bersetuju
1. There is a special person who is around when I am in need. <i>Ada orang istimewa yang ada ketika saya memerlukan.</i>	1	2	3	4	5	6	7
2. There is a special person with whom I can share joys and sorrows. <i>Ada orang istimewa dengan siapa saya boleh berkongsi kegembiraan dan kesedihan.</i>	1	2	3	4	5	6	7
3. My family really tries to help me. <i>Keluarga saya benar-benar cuba membantu saya.</i>	1	2	3	4	5	6	7
4. I get the emotional help and support I need from my family. <i>Saya mendapat</i>	1	2	3	4	5	6	7

<i>bantuan emosi dan sokongan yang saya perlukan dari keluarga saya.</i>							
5. I have a special person who is a real source of comfort to me. <i>Saya mempunyai orang istimewa yang merupakan</i>	1	2	3	4	5	6	7
<i>sumber keselesaan yang sebenar kepada saya.</i>							
6. My friends really try to help me. <i>Rakan-rakan saya benar-benar cuba membantu saya.</i>	1	2	3	4	5	6	7
7. I can count on my friends when things go wrong. <i>Saya boleh bergantung kepada rakan saya apabila keadaan menjadi salah.</i>	1	2	3	4	5	6	7
8. I can talk about my problems with my family. <i>Saya boleh bercakap tentang masalah saya dengan keluarga saya.</i>	1	2	3	4	5	6	7
9. I have friends with whom I can share my joys and sorrows. <i>Saya mempunyai kawan dengan siapa saya boleh berkongsi kegembiraan dan kesedihan saya.</i>	1	2	3	4	5	6	7
10. There is special person in my life who cares about my feelings. <i>Ada orang istimewa dalam hidup saya yang peduli</i>	1	2	3	4	5	6	7

<i>terhadap perasaan saya.</i>							
11. My family is willing to help me make decisions. <i>Keluarga saya bersedia membantu saya membuat keputusan.</i>	1	2	3	4	5	6	7
12. I can talk about my problems with my friends. <i>Saya boleh bercakap tentang masalah saya dengan kawan saya.</i>	1	2	3	4	5	6	7

Beck Depression Inventory

Read the statements carefully and circle the score between 0-3 about your feelings in past 1 week including today.

Baca pernyataan dengan teliti dan bulatkan markah 0-3 tentang perasaan anda pada minggu lepas termasuk hari ini.

0	I do not feel sad <i>Saya tak rasa sedih</i>
1	I feel sad <i>Saya rasa sedih</i>
2	I am sad all the time and I can't snap out of it <i>Saya kesedihan sepanjang masa dan sukar meredakannya</i>
3	I am so sad and unhappy that I can't stand it <i>Saya sangat sedih atau tak gembira sehingga tak mampu menanggungnya lagi</i>

0	I am not particularly discouraged about the future <i>Saya tak rasa lemah semangat mengenai masa depan</i>
1	I feel discouraged about the future <i>Saya rasa lemah semangat tentang masa depan</i>
2	I feel I have nothing to look forward to <i>Saya rasa tiada apa yang hendak diharapkan</i>
3	I feel the future is hopeless and that things cannot improve <i>Saya rasa masa depan saya mengecewakan dan keadaan takkan bertambah baik</i>

0	I do not feel like a failure <i>Saya tak rasa saya seorang yang gagal</i>
1	I feel I have failed more than the average person. <i>Saya rasa saya dah gagal lebih dari orang biasa</i>
2	As I look back on my life, all I can see is a lot of failures <i>Apabila terkenangkan masa lalu, saya hanya nampak banyak kegagalan</i>
3	I feel I am a complete failure as a person <i>Saya rasa saya seorang manusia yang benar-benar gagal</i>

0	I get as much satisfaction out of things as I used to <i>Saya dapat kepuasan daripada perkara yang pernah saya lakukan</i>
1	I don't enjoy things the way I used to <i>Saya tak seronok seperti dulu</i>
2	I don't get real satisfaction out of anything anymore <i>Saya tak dapat kepuasan sebenar daripada apa sahaja</i>
3	I am dissatisfied or bored with everything <i>Saya tak puas hati atau bosan dengan segalanya</i>

0	I don't feel particularly guilty <i>Saya tak rasa begitu bersalah</i>
1	I feel guilty a good part of the time <i>Saya rasa bersalah sekali-sekala sahaja</i>
2	I feel quite guilty most of the time <i>Saya rasa agak bersalah hampir setiap masa</i>
3	I feel guilty all of the time <i>Saya rasa bersalah sepanjang masa</i>
0	I don't feel I am being punished <i>Saya tak rasa saya sedang dihukum</i>
1	I feel I may be punished <i>Saya rasa saya mungkin dihukum</i>
2	I expect to be punished <i>Saya percaya saya akan dihukum</i>
3	I feel I am being punished <i>Saya rasa saya sedang dihukum</i>
0	I don't feel disappointed in myself <i>Saya tak rasa kecewa dengan diri saya</i>
1	I am disappointed in myself <i>Saya kecewa dengan diri saya</i>
2	I am disgusted with myself <i>Saya rasa meluat dengan diri saya</i>
3	I hate myself <i>Saya benci diri saya</i>
0	I don't feel I am any worse than anybody else <i>Saya tak rasa saya lebih teruk daripada orang lain</i>
1	I am critical of myself for my weaknesses or mistakes <i>Saya sentiasa mencari kelemahan dan kesilapan diri sendiri</i>
2	I blame myself all the time for my faults <i>Saya menyalahkan diri saya setiap kali berlaku kesilapan</i>
3	I blame myself for everything bad that happens <i>Saya menyalahkan diri sendiri atas setiap perkara buruk yang berlaku</i>
0	I don't have any thoughts of killing myself <i>Saya tak terfikir untuk bunuh diri</i>
1	I have thoughts of killing myself, but I would not carry them out <i>Saya ada terfikir untuk bunuh diri, tapi saya tak akan melakukannya</i>
2	I would like to kill myself <i>Saya ingin bunuh diri</i>
3	I would kill myself if I had the chance <i>Saya akan bunuh diri jika berpeluang</i>
0	I don't cry any more than usual <i>Saya tak menangis lagi daripada kebiasaannya</i>

1	I cry more now than I used to <i>Saya kerap menangis sekarang daripada biasa</i>
2	I cry all the time now <i>Saya kini menangis sepanjang masa</i>
3	I used to be able to cry, but now I can't cry even though I want to <i>Saya biasanya boleh menangis, tapi kini saya tak dapat menangis walaupun saya mahu</i>
0	I am no more irritated by things than I ever was <i>Saya tidak lagi sakit hati seperti sebelum ini</i>
1	I am slightly more irritated now than usual <i>Saya lebih mudah meradang atau sakit hati daripada biasa</i>
2	I am quite annoyed or irritated a good deal of the time <i>Saya rasa sakit hati sepanjang masa</i>
3	I feel irritated all the time <i>Saya tak lagi rasa sakit hati dengan perkara yang selalunya menyakitkan hati saya sebelum ini</i>
0	I have not lost interest in other people <i>Saya tak hilang minat terhadap orang lain</i>
1	I am less interested in other people than I used to be. <i>Saya kurang minat terhadap orang lain berbanding dulu</i>
2	I have lost most of my interest in other people <i>Saya hampir hilang minat terhadap orang lain</i>
3	I have lost all of my interest in other people <i>Saya tak berminat langsung dengan orang lain</i>
0	I make decisions about as well as I ever could <i>Saya cuba buat keputusan sebaik mungkin</i>
1	I put off making decisions more than I used to <i>Saya lebih sering menangguh urusan membuat keputusan</i>
2	I have greater difficulty in making decisions more than I used to <i>Saya sukar buat keputusan berbanding dulu</i>
3	I can't make decisions at all anymore <i>Saya tidak lagi mampu membuat keputusan</i>
0	I don't feel that I look any worse than I used to <i>Saya tak kelihatan teruk berbanding dulu</i>
1	I am worried that I am looking old or unattractive <i>Saya risau kelihatan tua atau tak menarik</i>
2	I feel there are permanent changes in my appearance that make me look unattractive <i>Saya rasa ada perubahan kekal pada penampilan saya yang membuat saya kelihatan kurang menarik</i>
3	I believe that I look ugly <i>Saya percaya saya kelihatan hodoh</i>

0	I can work about as well as before <i>Saya boleh bekerja dengan baik seperti biasa</i>
1	It takes an extra effort to get started at doing something <i>Ia mengambil usaha yang lebih untuk memulakan sesuatu kerja</i>
2	I have to push myself very hard to do anything <i>Saya harus memaksa diri saya untuk buat sesuatu</i>
3	I can't do any work at all <i>Saya tak boleh lansung membuat apa-apa kerja</i>
0	I can sleep as well as usual <i>Saya boleh tidur macam biasa</i>
1	I don't sleep as well as I used to <i>Saya tak tidur nyenyak seperti biasa dan sukar untuk tidur semula</i>
2	I wake up 1-2 hours earlier than usual and find it hard to get back to sleep <i>Saya terjaga 1-2 jam awal daripada biasa dan sukar untuk tidur semula</i>
3	I wake up several hours earlier than I used to and cannot get back to sleep <i>Saya bangun awal beberapa jam daripada biasa dan tak boleh tidur semula</i>
0	I don't get more tired than usual <i>Saya tak rasa letih lebih dari biasa</i>
1	I get tired more easily than I used to <i>Saya lebih mudah letih dari biasa</i>
2	I get tired from doing almost anything <i>Saya letih ketika melakukan apa saja</i>
3	I am too tired to do anything <i>Saya terlalu letih untuk buat apa sahaja</i>
0	My appetite is no worse than usual <i>Selera makan saya tak seteruk dulu</i>
1	My appetite is not as good as it used to be <i>Selera makan saya tak sebagus seperti selalu</i>
2	My appetite is much worse now <i>Selera makan saya makin teruk</i>
3	I have no appetite at all anymore <i>Saya langsung tak ada selera</i>
0	I haven't lost much weight, if any, lately <i>Saya tak hilang banyak berat badan akhir-akhir ini</i>
1	I have lost more than 2kg <i>Saya hilang berat badan lebih dari 2kg</i>
2	I have lost more than 4kg <i>Saya hilang berat badan lebih dari 4kg</i>
3	I have lost more than 6kg <i>Saya hilang berat badan lebih dari 6kg</i>
0	I am no more worried about my health than usual <i>Saya tak lagi bimbangkan kesihatan saya lagi seperti kebiasaannya</i>

1	I am worried about physical problems like aches, pains, upset stomach, or constipation <i>Saya risau masalah fizikal seperti sengal dan kesakitan; perut sebu; atau sembelit</i>
2	I am very worried about physical problems and it's hard to think of much else <i>Saya risau dengan masalah fizikal ini hingga sukar untuk memikirkan perkara lain</i>
3	I am so worried about my physical problems that I cannot think of anything else <i>Saya sangat risau dengan masalah fizikal saya sehinggakan langsung tak dapat fikir hal lain</i>
0	I have not noticed any recent change in my interest in sex <i>Saya rasa tiada perubahan dalam keinginan seks saya</i>
1	I am less interested in sex than I used to be <i>Saya kurang keinginan seks berbanding dahulu</i>
2	I have almost no interest in sex <i>Saya semakin tiada keinginan terhadap seks</i>
3	I have lost interest in sex completely <i>Saya langsung tiada keinginan terhadap hubungan seks</i>

Frailty Phenotype Questionnaire (FPQ)

Based on the questions below, choose the correct answers from the answer options regarding your status.

Berdasarkan soal-an di bawah, pilih pilihan yang tepat berdasarkan status anda.

Item	Name of Question <i>Nama Soalan</i>	Questions <i>Soalan</i>	Pilihan Answer Options <i>Jawapan</i>	Score <i>Markah</i>
Fatigue <i>Kelesuan</i>	Exhaustion <i>Keletihan</i>	During the past week, I felt that everything I did was an effort <i>Dalam seminggu yang lalu, saya rasa semua yang saya lakukan adalah satu usaha.</i>	1) Rare (less than one day per week) 2) Sometimes (1-2 days per week) 3) Often (3-4 days per week) 4) Most (over 5 days per week) <i>Jarang (kurang daripada satu hari seminggu) Kadang-kadang (1-2 hari seminggu) Kerap (3-4 kali seminggu) Kebanyakan (lebih 5 hari seminggu)</i>	1=3) or 4) 0=1) or 2)
Resistance <i>Rintangan</i>	10 steps of stair climb <i>10 langkah menaiki anak tangga</i>	By yourself and not using aids, do you have any difficulty walking up 10 stairs without resting? <i>Tanpa bantuan apaapa, adakah anda mengalami kesusahan untuk berjalan menaiki 10 anak tangga?</i>	1) Yes 2) No 1) Ya 2) Tidak	1=1) 0=2)

Ambulation <i>Ambulasi</i>	Walking one lap of playground (400m)	Do you have any difficulty walking one lap of a playground track (400m)?	1) Unable to do it 2) Very difficult 3) A bit difficult 4) Not difficult at all	1=1) or 2) or 3) 0=4)
	<i>Berjalan satu pusingan taman permainan (400m)</i>	<i>Adakah anda mengalami kesusahan berjalan satu pusingan taman permainan (400m)?</i>	1) <i>Tidak boleh</i> 2) <i>Sukar</i> 3) <i>Sedikit sukar</i> 4) <i>Tidak sukar</i>	
Inactivity <i>Tidak Aktif</i>	Moderate to vigorous physical activities of IPAQ <i>Aktiviti fizikal sederhana dan lasak dalam IPAQ</i>	During the past week, how often did you participate in any moderate physical activities that make you slightly breathless that usual? During the past week, how often did you engage in vigorous physical activities? <i>Dalam seminggu yang lalu, berapakah kekerapan anda melakukan aktiviti fizikal sederhana yang membuatkan anda sedikit termengahmengah daripada biasa?</i> <i>Dalam seminggu yang lalu, berapakah kekerapan anda melakukan aktiviti fizikal lasak?</i>	1) Never More 2) than once a week 1) Never More 2) than once a week 1) <i>Tidak pernah</i> 2) <i>Lebih sekali seminggu</i> 1) <i>Tidak pernah</i> 2) <i>Lebih sekali seminggu</i>	1=1) on the both questions 0= Others 1=1) kedua-dua soalan 0= Lainlain

Loss of weight <i>Penurunan Berat Badan</i>	Weight loss for 1 year <i>Penuruna berat badan dalam setahun</i>	Was there any unintended weight loss of 4.5kg in the past year? <i>Adakah anda mengalami 4.5kg penurunan berat badan yang tidak dikehendaki sepanjang setahun yang lalu?</i>	1) Yes 2) No 1) <i>Ya</i> 2) <i>Tidak</i>	1=1) 0=2)
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Dietary intake

Pemakanan sehari-hari Informations on dietary intake is collected for non-dialysis day and dialysis day.

Infomasi tentang pemakanan diambil untuk hari menjalani dialisis dan hari tidak menjalani dialisis.

Researchers will ask the subject on 24-hour food recall for non-dialysis day and researcher will telephone interview subject to obtain the food recall for dialysis day. *Pengkaji akan tanya subjek tentang pemakanan untuk hari tidak menjalani dialisis dan pengkaji akan menelefon subjek untuk mengambil pemakanan untuk hari menjalani dialysis.*

Non-dialysis day (*Hari tidak menjalani dialysis*)

Meal	Meal time	Food/drink items	Amount	Method of food preparation

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Dialysis day

Hari menjalani dialisis

Meal	Meal time	Food/drink items	Amount	Method of food preparation