UNIVERSITI PUTRA MALAYSIA

ASSOCIATIONS OF SOCIO-DEMOGRAPHIC, NUTRITIONAL STATUS AND QUALITY OF LIFE WITH FUNCTIONAL STATUS AMONG PRE-OPERATIVE SURGICAL PATIENTS IN A SELECTED PUBLIC HOSPITAL

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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

This project is entitled "Associations of Socio-Demographic, Nutritional Status and Quality of Life with Functional Status among Pre-Operative Surgical Patients in a selected Public Hospital" was prepared by Sunitta A/P Eh Sot and submitted to the Faculty of Medicine and Health Sciences 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

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ABBREVIATIONS

Abbreviations	Meaning
AWGS	Asian Working Group for Sarcopenia
ASPEN	American Society for Parenteral and Enteral Nutrition
BMI	Body Mass Index
HGS	Handgrip Strength
MOH	Ministry of Health Malaysia
NMRR	National Medical Research Registry
QOL	Quality of Life
WHO	World Health Organization

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ABSTRACT

ASSOCIATIONS OF SOCIO-DEMOGRAPHIC, NUTRITIONAL STATUS AND QUALITY OF LIFE WITH FUNCTIONAL STATUS AMONG PRE-OPERATIVE SURGICAL PATIENTS IN A SELECTED PUBLIC HOSPITAL

Sunitta A/P Eh Sot

Functional status is an individual's ability to perform normal daily activities required to meet basic needs, fulfill usual roles and maintain health and well-being. Various studies determined factors associated with functional status has been done as impaired functional status usually associates with long recovery period after surgery. However, there were limited studies on functional status specifically conducted among pre-operative surgical patient especially in Malaysia. Therefore, this cross-sectional study was conducted to assess the association between socio-demographic and nutritional status (anthropometry data, biochemical data, dietary intake) with functional status among pre-operative surgical patients in Hospital Serdang, Selangor. Socio-demographic information was obtained through face-to-face interview. Height and weight were measured for BMI. Albumin and hemoglobin were retrieved through medical record. Dietary intake and quality of life (QOL) were assessed through 24-hour diet recall and SF-36 questionnaires, respectively. Whereas functional status of the subjects was assessed through hand grip strength (HGS). A total of 38 subjects (12 male and 26 female) with mean age 46.6 ± 14.8 years were participated in this study. Most of the subjects were having abnormal BMI with the mean of 26.7 ± 6.7 kg/m^2. Majority of the subjects were having normal hemoglobin (12.7 ± 1.8 g/dL) and albumin (3.6 ± 0.5 g/dL). Subjects consumed 1339 ± 532 kcal/day and 52 ± 31 g protein/day. For QOL, subjects score the highest (94.4 ± 14.1) for social functioning and the lowest (55.3 ± 45.5) for role limitations due to physical health. For functional status, majority of the subjects (55.3%) were having strong HGS and most of them were female (65.4%). Age (r=-0.334, p=0.041) was found negatively correlated while energy intake (r=0.407, p=0.011) was positively correlated with functional status. Further intervention is needed to prevent post-operative complications, reduced hospital stays period and improved recovery phase.

ABSTRAK

PENGHUBUNGKAIT ANTARA FAKTOR-FAKTOR SOCIO-DEMOGRAFI, STATUS PEMAKANAN DAN KUALITI KEHIDUPAN DENGAN STATUS FUNGSI KEUPAYAAN DALAM KALANGAN PESAKIT SEBELUM PEMBEDAHAN DI SEBUAH HOSPITAL AWAM TERPILIH

Sunitta A/P Eh Sot

Fungsi keupayaan merupakan kemampuan individu untuk melakukan aktiviti harian biasa yang diperlukan untuk memenuhi keperluan asas, peranan dan kesejahteraan kesihatan. Pelbagai kajian tentang faktor berkaitan fungsi keupayaan telah dilaksanakan kerana gangguannya dikaitkan dengan tempoh pemulihan yang panjang selepas pembedahan. Walau bagaimanapun, terdapat kajian yang terhad dilakukan secara khususnya dalam kalangan pesakit sebelum pembedahan terutamanya di Malaysia. Oleh itu, kajian ini dilakukan untuk menilai hubungan antara faktor-faktor socio-demografi, status pemakanan dan kualiti kehidupan dengan status fungsi keupayaan dalam kalangan pesakit sebelum pembedahan di Hospital Serdang, Selangor. Maklumat sosio-demografi diperoleh melalui temu ramah bersemuka. Tinggi dan berat diukur untuk BMI. Albumin dan hemoglobin diambil melalui rekod perubatan. Pengambilan makanan dan kualiti hidup (QOL) dinilai melalui pengingat diet 24 jam dan soal selidik SF-36. Manakala fungsi keupayaan dinilai melalui kekuatan pegangan tangan (HGS). Sebanyak 38 subjek (12 lelaki dan 26 perempuan) dengan purata usia 46.6 ± 14.8 tahun telah mengambil bahagian dalam kajian ini. Sebilangan besar subjek mempunyai BMI yang tidak normal dengan min 26.7 ± 6.7 kg / m^2. Sebilangan besar subjek mempunyai hemoglobin (12.7 ± 1.8 g / dL) dan albumin (3.6 ± 0.5 g / dL) yang normal. Subjek mengambil 1339 ± 532 kcal / hari dan 52 ± 31 g protein / hari. Bagi QOL, subjek memperoleh skor tertinggi (94.4 ± 14.1) untuk fungsi sosial dan terendah (55.3 ± 45.5) untuk had peranan kerana kesihatan fizikal. Untuk fungsi keupayaan, majoriti subjek (55.3%) mempunyai HGS yang kuat dan kebanyakan mereka adalah wanita (65.4%). Umur (r = -0,334, p = 0,041) didapati berkorelasi negatif manakala pengambilan tenaga (r = 0,407, p = 0,011) adalah berkorelasi positif dengan fungsi keupayaan. Intervensi lebih lanjut diperlukan untuk mencegah komplikasi pasca operasi, pengurangan tempoh tinggal di hospital dan fasa pemulihan yang lebih baik.

CHAPTER 1

INTRODUCTION

1.1 Background

Rate of surgery is increasing day by day all around the world. In 2011, there were 166 hospitals in Malaysia that provide general surgical services. Approximately 91,144 surgeries were performed in public hospital in the same year with 49.5% were electives cases (CRC, 2011). Besides, it was estimated that in 2004 approximately 234.2 million people were performed operations worldwide based on modelling of available data. Based on the report from Australian Institute of Health and Welfare, 874,000 patients were added to public hospital elective surgery waiting lists in 2017–2018. Elective surgery is a procedure that is scheduled in advance and not immediately life threatening and may be planned within weeks or months (Prin et al., 2018). While general surgery is a surgical specialty focusing on the organs of the abdomen such as the esophagus, stomach, intestines, gall bladder, liver and pancreas. General surgeons may also treat diseases of the skin and breast. Thus, patients who are required to undergo surgery are referred as pre-operative surgical patients.

According to American Thoracic Society (2007), functional status is defined as an individual's ability to perform normal daily activities required to meet basic needs, fulfill usual roles and maintain health and well-being. Handgrip strength (HGS) is one of the cheap yet non-invasive clinical tools which use to measure the functional status and indicator of population general health. There is enough evidence to support the use of grip strength to describe the specific outcomes such as generalized strength and function, bone mineral density, fractures, and falls, nutritional status, disease status and comorbidity load, cognition, depression, and sleep, hospital-related variables, and mortality (Bohannon, 2019).

Consequences of low HGS levels may cause in physical function loss besides associate with long recovery period after surgery (de Lima et al., 2017). Low HGS also associated with falls, disabilities, impaired health-related quality of life and increased mortality (Kim et al., 2019). The results from a longitudinal prospective cohort study in Pennsylvania examining older women who underwent surgery for prolapse suggest that preoperative functional limitations predict the risk of increased functional limitations following surgery (Cited in Brinson, Tang & Finlayson, 2016).

Furthermore, the preoperative phase provide a chance to enhance patients' nutritional, functional and psychological state before surgery (Levett et al., 2016). Having adequate amount of nutrient is important to avoid pre-operative malnutrition. According to American Society for Parenteral and Enteral Nutrition (ASPEN), malnutrition is defined as "an acute, subacute or chronic state of nutrition, in which a combination of varying degrees of overnutrition or undernutrition with or without inflammatory activity have led to a change in body composition and diminished function" (ASPEN, 2012). Gillis & Wischmeyer (2019) stated that malnourished hospitalized and surgical patients have worse clinical outcome such as fourfold greater risk of mortality, delayed wound healing, prolonged hospital stay, more postoperative complications, frequent readmission and increased healthcare cost. More than half of the general surgical practice is consisted of elderly patient, and their complication rates range from 7 % to 20 % and mortality rates range from 0 % to 5 % for elective procedures (Rajendram et al., 2015).

According to World Health Organization, quality of life (QOL) is defined as "the individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals" (WHO, 2014). In comparison to WHO's definition, CDC defines QOL as "an individual's group's perceived physical and mental health

over time" (CDC, 2000). The satisfaction of the patients toward their well-being and QOL prior to surgery is important to alleviate the postoperative outcomes.

1.2 Problem Statement

Functional status issue among pre and post operational surgery become a big concern towards the healthcare professional team. A recent longitudinal population study done in 17 countries of varying incomes and sociocultural settingsshown that lower muscle strength in adult aged 35 – 70 years, which measured by HGS has predicted the risks of CVD and all-cause mortality (Cited in Shahrook, 2017). From a cohort study among gastrointestinal tract and intra-abdominal malignancy patients at a selected hospital in India showed a statistically significant result ($p < 0.0001$) that preoperative low HGS patients had a longer stay (22.2 days) in ICU compared to normal HGS patients (11.96 days) after surgery (Shah et al., 2019).

Contradiction on the results of past literature have to do with the factors associated with pre-operative surgical patients. A cross-sectional study by Kim et al. (2019) stated that both gender of participants with low HGS had lower BMI than the normal HGS group. However, Lee et al. (2012) on population-based cohort study reported that HGS is influenced by BMI in men but not in women. The studies showed in differences although both of them were done on Korean elderly patient.

Functional status is usually assessed among normal adult and older population in most countries of the world. However, limited studies have been specifically conducted on factors related with functional status among pre-operative surgical patients. Besides, most of the studies found are from other countries such as Korea, Sri, Lanka, Japan and etc. and it might be not similar for Malaysia as the lifestyle and dietary pattern are quite different from each other. Therefore, lack of data assessment on functional status in pre-operative surgical patients has led to lack of understanding on the factors associated with functional status of them.

1.3 Research Questions

1. What is the functional status among pre-operative surgical patients in Hospital Serdang, Selangor.
2. What are the association of socio-demographic, nutritional status (anthropometry data, biochemical data and dietary intake), quality of life with functional status among pre-operative surgical patients in Hospital Serdang, Selangor.

1.4 Significance of the Study

First and foremost, this study is conducted to determine the associations between socio-demographic, anthropometry data, biochemical data, dietary intake and quality of life with functional status among pre-operative surgical patients in Hospital Serdang, Selangor.

This study was able to fill the gaps in existing knowledge regarding the functional status among pre-operative surgical patients as there is lack of knowledge on the variables stated above. From the results of this study, new knowledge on relationship between socio-demographic characteristics, anthropometry data, biochemical data, dietary intake and quality of life with functional status among pre-operative surgical patients in Malaysia can be generated and added to the body of knowledge in this aspect.

Furthermore, this study can also be baseline information for future researcher who is going to conduct a further study related to functional status of pre-operative patients in Malaysia. It can be very useful for new studies that aimed to solve the problems regarding the functional status limitations in pre-operative patients by handling and tackling the related factors.

This finding can also give insight and better understanding for policy makers, researchers and healthcare professionals on future intervention. Early detection is really important for the patient at risk, so that steps taken to prevent the occurrence of the functional

status limitations after undergo the surgical procedures can be provided to the patient as well as the awareness on how to taking a good care of themselves. Thus, effective intervention program can be planned and conducted to ensure patients are in their healthy and optimum state and achieve better quality of life before and after the surgery.

1.5 Objectives

i. General Objective

To assess the association between socio-demographic, anthropometry data, biochemical data, dietary intake, quality of life and functional status among pre-operative surgical patients in Hospital Serdang, Selangor.

ii. Specific Objective

1. To assess functional status among pre-operative surgical patients in Hospital Serdang, Selangor.
2. To identify the socio-demographic, anthropometry data, biochemical data, dietary intake and quality of life among pre-operative surgical patients in Hospital Serdang, Selangor.
3. To determine the associations of socio-demographic, anthropometry data, biochemical data, dietary intake, quality of life with functional status among pre-operative surgical patients in Hospital Serdang, Selangor.

1.6 Null Hypothesis

There is no relationship between socio-demographic, anthropometry data, biochemical data, dietary intake, quality of life and functional status among pre-operative surgical patients in Hospital Serdang, Selangor.

1.7 Conceptual Framework

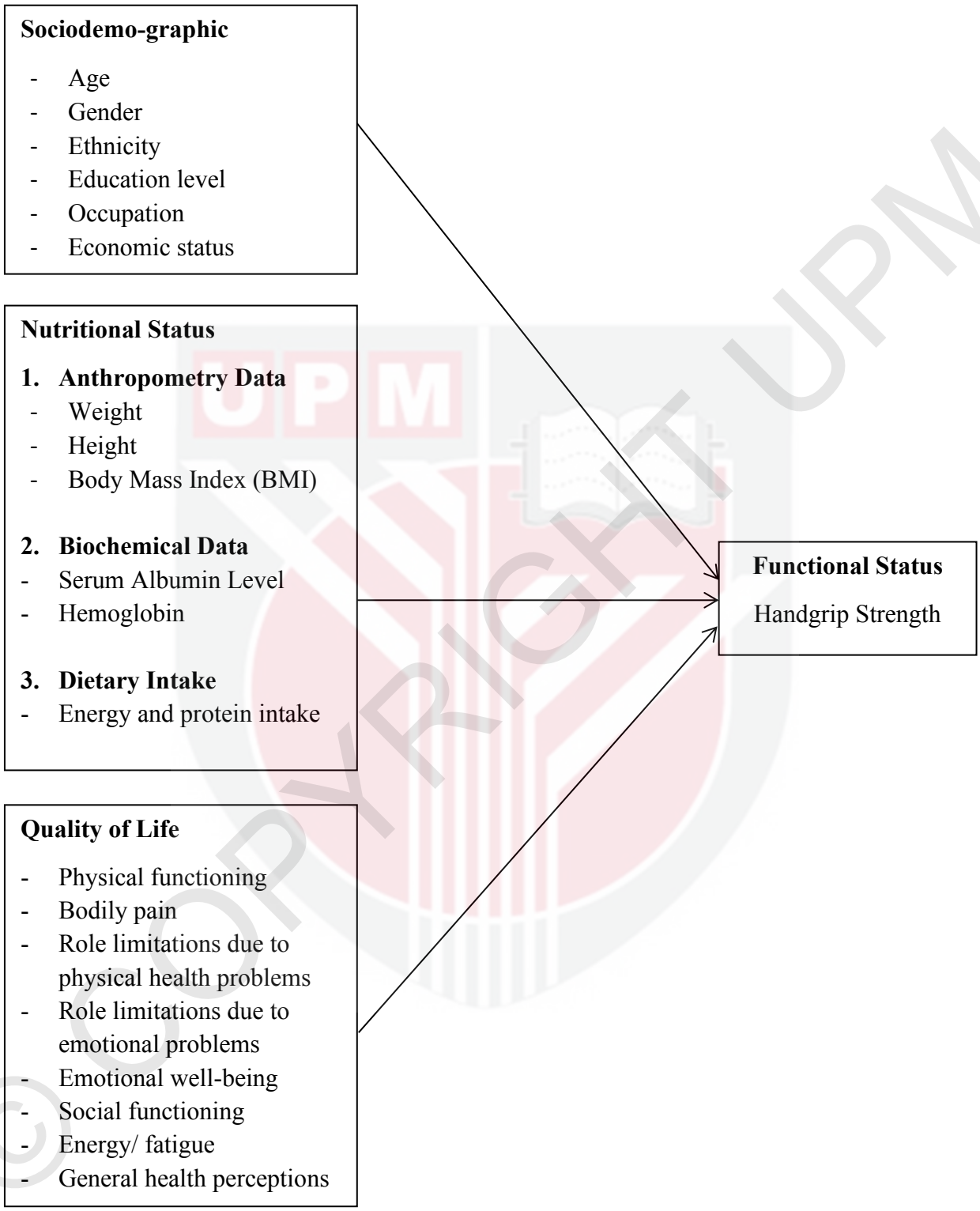

Figure 1.0 Conceptual framework

CHAPTER 2

LITERATURE REVIEW

2.1 Socio-demographic Factors

Handgrip strength is found to be associated with socio-demographic factors in normal population. Based on a systematic review of the adult population, men tend to display higher handgrip strength scores compared to women while the lower the grip strength will be in higher age people (de Lima et al., 2017). Decreased in muscle strength can be seen due to loss of muscle mass and reduction in skeletal muscle were normal when aging (Abe et al., 2014). A cross-sectional study among elderly in Sri Lanka showed that male older people had a higher HGS (17.02, 95% confidence interval: 15.55 - 18.49 kg) than females (10.59, 95% confidence interval: 10.12 - 11.06 kg) (Damayanthi et al., 2018).

In elderly Korean population, the number of participants with low socio-economic status is higher in the low HGS group (Kim et al., 2019). Furthermore, de Lima et al. (2017) concluded that higher education level was also contributed to greater HGS level in adult population while Kim et al. (2019) also state that elderly with low HGS are associated with lower schooling.

2.2 Nutritional Status

i. Anthropometry Data

Furthermore, anthropometric elements such as height, weight, Body Mass Index (BMI) were associated with HGS. According to Kim et al. (2019), both gender of participants with low HGS had lower BMI than the normal HGS group. However, Lee et al. (2012) reported that HGS is influenced by height in both gender, and additionally by BMI in men but not in women. In the recent study of community-dwelling Japanese women, results show that body height is positively related to HGS (Yamada et al., 2015)

ii. Biochemical Data

Apart from that, biochemical data such as serum albumin level and hemoglobin level may be associated with functional status of pre-operative patients. Based on Yamada et al. (2015), low level of hemoglobin will lead to low muscle strength as HGS showed positive correlations with red blood cell count, hemoglobin and hematocrit besides serum albumin in community-living elderly Japanese women. Besides, Hsu, Hwang, Lin, Lin, & Tjung (2015) in their study among elderly patients in North Taiwan found that lower albumin level significantly ($p < 0.01$) correlated with poor functional status and higher in-hospital mortality rate. Also, preoperative hypoalbuminemia was significantly associated with higher morbidity and longer hospital stay regardless of the type of surgery (Badia-Tahull et al., 2009).

iii. Dietary Intake

The next factor associated with functional status in pre-operative surgical patients is patient's dietary intake. Inadequate protein and energy intake were observed frequently in low HGS group in a study among older Korean population (Kim et al., 2019). Based on a systematic review by Manoharan, Sundaram, & Jason (2015) conclude that nutrition should be considered during assessing and training HGS as nutritional status is contributed to specific levels of body mass, which in turn has found to correlate directly to HGS.

2.3 Quality of Life

Besides, quality of life (QOL) is also a factor that associates with the functional status of surgical patients in preoperative surgery. In the present study, the mean HGS is positively associated with quality of life in both males and females among community-dwelling older adults in southern Brazil (Pruner et al., 2019). Lower pre-operative quality of life scores in physical and functional domains are associated with increased risk of post-operative morbidity and 30 days readmission (Doll et al., 2014). The strength of handgrip showed a significant

correlation with the quality of life among elderly outpatients in a hospital of Indonesia (Wiraguna & Setiati, 2018).

CHAPTER 3

METHODOLOGY

3.1 Study Design

This was a cross sectional study that aimed to determine the association of socio-demographic, anthropometry data, biochemical data, dietary intake and quality of life with functional status among pre-operative surgical patients in Hospital Serdang, Selangor.

3.2 Study Location

This study was conducted at Hospital Serdang, Selangor. Hospital Serdang is located in Sepang district and state of Selangor, Malaysia. The location of Hospital Serdang borders the South Klang Valley Expressway (SKVE) to the east and the Faculty of Medicine, Universiti Putra Malaysia (UPM) to the west. The hospital with a total area of 129,000 square metres was built with the purpose to provide medical services to approximately 570,000 people in Serdang, Putrajaya, Kajang and Bangi areas. Hospital Serdang is a government-funded multi-specialty hospital which operating on the concept of information technology called "Integrated Hospital Information System" (T.H.I.S). In addition, it is a reference hospital with 620 beds equipped with the latest amenities and includes 'Specialist Secondary Unit and Tertiary Levels of Care'. Besides, the hospital provides medical services and treatment according to current needs for inpatients and outpatients. It is also known as a 'teaching hospital' for UPM medical and health sciences students.

3.3 Sample Size Determination

Correlation sample size formula based on Hulley et al. (2013):

$$N = [(Z_\alpha + Z_\beta)/C]^2 + 3$$

$$C = 0.5 * \ln[(1+r)/(1-r)]$$

Where

Z_α = the standard normal deviate for $\alpha = 1.96$

Z_β = the standard normal deviate for $\beta = 0.84$

r = the expected correlation coefficient

Table 3.1 Sample size calculation

Correlation studies	Correlation, r	Sample size, n
Age and Anthropometric Traits Predict Handgrip Strength in Healthy Normals (Chandrasekaran et al., 2016)	**Age; r = 0.44**	C= 0.5 *ln[(1+0.44)/(1-0.44)] = 0.472 N= $[(1.96+0.84)/(0.472)]^2 + 3$ = 38.19 = 39
	Height; r = 0.57	C= 0.5 *ln[(1+0.57)/(1-0.57)] = 0.648 N= $[(1.96+0.84)/(0.648)]^2 + 3$ = 21.67 = 22
	Weight; r = 0.57	C= 0.5 *ln[(1+0.57)/(1-0.57)] = 0.648 N= $[(1.96+0.84)/(0.648)]^2 + 3$ = 21.67 = 22
	BMI; r = 0.29	C= 0.5 *ln[(1+0.29)/(1-0.29)]

		= 0.299 N= $[(1.96+0.84)/(0.299)]^2 + 3$ = 90.69 = 91
Association of Handgrip Strength with Dietary Intake in the Korean Population (S. Lee et al., 2018)	**Energy; r = 0.411**	C= 0.5 *ln[(1+0.411)/(1-0.411)] = 0.437 N= $[(1.96+0.84)/(0.437)]^2 + 3$ = 44.05 = 45

Estimated response rate = 20% × 22 = 4.4

N = 27

Estimated response rate = 20% × 91 = 18.2

N = 110

Based on the Table 3.3, the lowest and highest of sample size calculated were 22 and 91. By considering the estimated response rate, the sample size needed in this study was in a range of **27 - 110.**

3.4 Subjects

The subjects for this study were pre-operative surgical patients. The inclusion and exclusion criteria are as followed:

i. Subjects' inclusion criteria

1. Adult patients 18 – 70 years old
2. Malaysian
3. Prior to undergo elective surgery
4. Able to communicate verbally

ii. Subjects' exclusion criteria

1. Patients with history of trauma in the hand or wrist or prior surgery on the upper extremity
2. Patients with critical illness who are not able to interview
3. Diagnosed with mental illness and cognitive impairment

3.5 Sampling Design

This study used a non-probability sampling design as shown in Figure 3.5. Hospital Serdang consist of 19 wards. Then, surgical wards such as Ward 6B and 6C were selected based on purposive sampling. Next, the patients who meet the inclusion and exclusion criteria and were available during the day of data collection were included in this study.

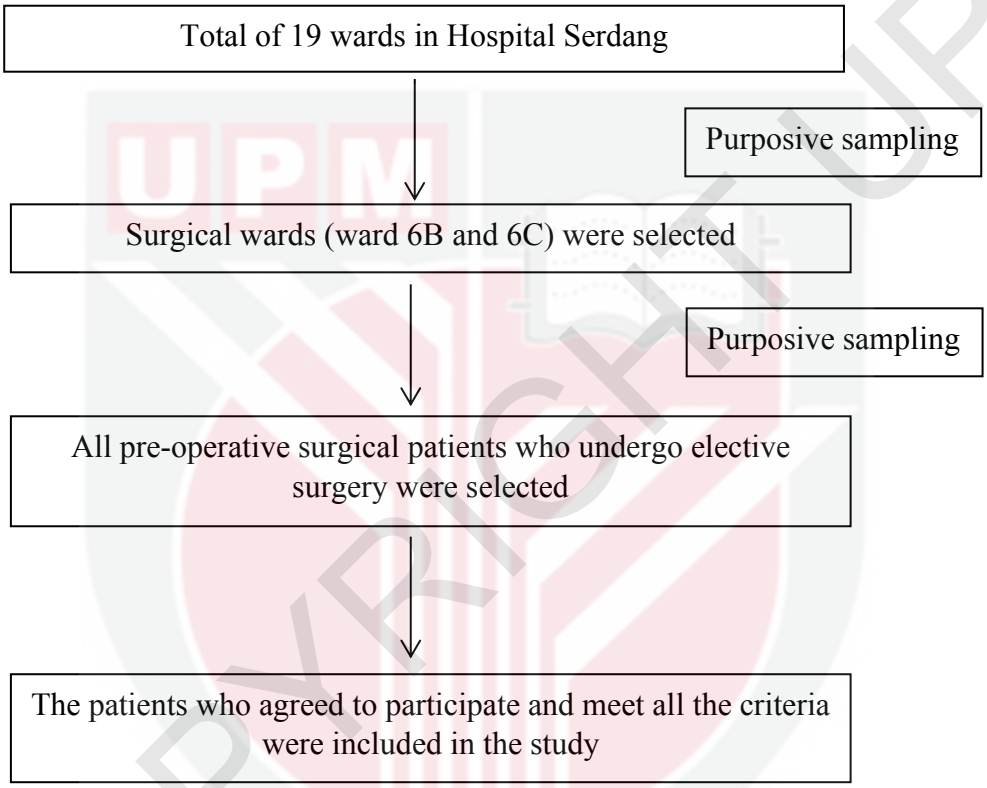

Figure 3.1 Sampling design

3.6 Measures

3.6.1 Socio-demographic information

Socio-demographic information such as age, gender, ethnicity, occupation and economic status were determined via face-to-face interview by the researcher. The information was either multiple choice answer or open-ended questions.

3.6.2 Nutritional Status

i. Anthropometry Measurement

The body weight of the pre-operative patients was measured using TANITA Digital Weight Scale HD306 (TANITA Corporation, USA) to the nearest 0.1kg. Height was measured using SECA Portable Stadiometer (SECA213, Germany) to the nearest 0.1cm. All anthropometric measurements were taken twice and for each measurement, the mean value was used in the analyses. As for the patients whom not able to stand up on their own, medical records were used to obtain their weight and height data.

The body weight and height obtained were used to determine body mass index (BMI) by using formula BMI = weight (kg)/height^2 (m). The World Health Organization cut-off points were used to classify the BMI of the patients; underweight, normal weight, overweight or obese as shown below.

Table 3.3: BMI classification based on WHO (2019)

< 18.5 kg/m^2	Underweight
18.5 – 24.9 kg/m^2	Normal
25.0 – 29.9 kg/m^2	Overweight/ Pre-obese
⩾ 30.0 kg/m^2	Obese

ii. Biochemical Data

Biochemical data of the patients were retrieved from their medical record. The data were consisting of serum albumin level and hemoglobin. Next, the value obtained was compared with the normal range value.

Table 3.4: Reference range of biochemistry profile (Rolfes et al., 2006)

Albumin (Alb)	3.5 – 5.0 g/dl
Hemoglobin (Hb)	Male: 14.0 – 18.0 g/dl Female: 12.0 – 16.0 g/dl

iii. Dietary Intake

Dietary intake of the subjects was assessed by the 24-h diet recall method, which is a nutritional survey method of estimating food intake of the subjects for the past 24 hours, thus it helps to reflect the recent dietary intake of the individuals. The information that had been included are time, location, type of food, amount and cooking method. The amount of the food consumed were measured in household measurement such as teaspoon, tablespoon, cup, glass, slice and so on. The quantity units then converted into standard metric unit such as grams and milliliter before key in in the Nutritionist Pro; a software use to analyze the total macro and micro nutrient intake. The total energy and protein intake for the patient were recorded. If the food was not available in the software, Malaysia Food Composition database was used to assist as well. Information that retrieved from the software were the calorie intake and protein intake. Formulas for calculating the adequacy of the patient's dietary intake are as below:

Calorie adequacy of the patient= $\frac{Patient's\ calorie\ intake\ (kcal)}{(Patient's\ weight \times 30kcal)} \times 100\%$

Protein adequacy of the patient = $\frac{Patient's\ protein\ intake\ (g)}{(Patient's\ weight \times 1.1g)} \times 100\%$

3.6.3 Quality of Life

Quality of life of the subjects were determined using SF-36 Questionnaire (Ware & Sherbourne, 1992). SF-36 Questionnaire was reliable as the respective Cronbach's α coefficients for each of the eight dimensions were > 0.70. Firstly, precoded numeric values were recoded per the scoring key given in Table 3.5. Each item was scored on a scale from 0 to 100 and a high score defined a more favourable health state. Next, the items in the same domain were averaged together to create the 8 scale scores. Table 3.6 lists the items averaged together to create each scale. For example, to measures a patient's role limitations due to emotional problems, add the scores from questions 17, 18 and 19. If the patient chooses 2 on 17, 2 on 18 and 1 on 19. So, the score for this domain is 100 + 100 + 0 = 200. Then, divide the answer by 3 to get a total of 66.7%. On the other hand, if there was missing data on any items, it took into account when calculating the scale sores. Therefore, scale scores represent the average for all items in the scale that the respondent answered.

Table 3.5: Recoding the items

Item numbers	**Change original response category ***	**To recoded value of:**
1, 2, 20, 22, 34, 36	1 →	100
	2 →	75
	3 →	50
	4 →	25
	5 →	0
3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1 →	0
	2 →	50
	3 →	100
13, 14, 15, 16, 17, 18, 19	1 →	0
	2 →	100
21, 23, 26, 27, 30	1 →	100
	2 →	80
	3 →	60
	4 →	40
	5 →	20
	6 →	0
24, 25, 28, 29, 31	1 →	0
	2 →	20
	3 →	40
	4 →	60
	5 →	80
	6 →	100
32, 33, 35	1 →	0
	2 →	25
	3 →	50
	4 →	75
	5 →	100

Table 3.6: Averaging items to form scales

Scale	Number of items	After recoding per Table 1, average the following items
Physical functioning	10	3 4 5 6 7 8 9 10 11 12
Role limitations due to physical health	4	13 14 15 16
Role limitations due to emotional problems	3	17 18 19
Energy/fatigue	4	23 27 29 31
Emotional well-being	5	24 25 26 28 30
Social functioning	2	20 32
Pain	2	21 22
General health	5	1 33 34 35 36

3.6.4 Functional status

Functional status of the patients was assessed by their handgrip strength using hand dynamometer. Domain hand was measured alternately three times and the greatest value was taken as the final grip strength. The subjects were instructed to standing face forward, straighten the shoulders and allow both arms to hang straight down naturally, with no flexion or extension of the wrist and elbow, with both feet and the width of the pelvis, and to maintain this posture during grip strength measurement (S. Lee et al., 2018). The cut-off values of HGS based on Asian Working Group for Sarcopenia (AWGS) in 2014 is <26kg in men and <18 kg in women, respectively. However, in 2019 AWGS revised the consensus report and another updated reference for cutoff values of handgrip strength in the older population from a pooled dataset from eight cohorts study in Asia is <28.0 kg and women <17.7 kg (Auyeung, Arai, Chen & Woo, 2020). The subjects were classified as having low HGS if they fail to achieve 28.0 kg for male and 17.7 kg for female.

3.7 Pre-Testing

Pre-testing was conducted at Hospital Serdang before the actual data collecting process was carried out. About 10 pre-operative surgical patients with similar characteristics as the study sample and fulfill the inclusion and exclusion criteria of this study were recruited and excluded from the real data collection. Pre-testing is essential to determine whether the questionnaire is applicable to the patients and to estimate the time taken to complete the questionnaire. Besides, improvement was done on the error arise based on the feedback received from the respondents.

3.8 Procedures

Data collection was carried out after getting approval from the Ministry of Health Malaysia (MOH) and National Medical Research Registry (NMRR). All pre-operative surgical patients in Hospital Serdang were chosen based on inclusion and exclusion criteria. The subjects were given an information sheet related to the purpose of the study. The consent form was obtained prior to the answering questionnaire. The whole process took approximately 35 minutes.

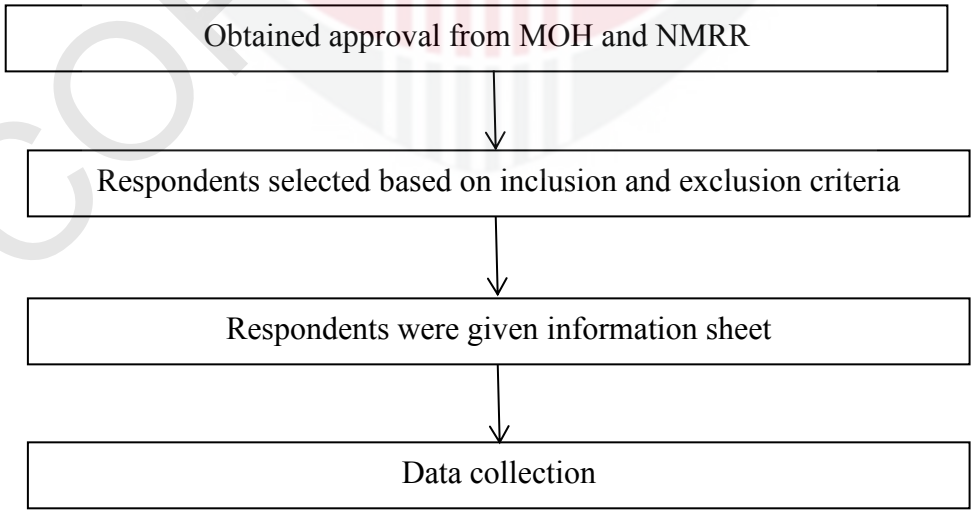

Figure 3.2 Flow of study procedures

3.9 Ethics Approval

The ethical approval from National Medical Research Registry (NMRR) (NMRR-18-459-40279) and permission from Hospital Serdang were required to carry out the study. Once the approval was obtained, the information sheet was given to the patients to inform them regarding the purpose of this study. The approval letter was sent to *Jawatankuasa Etika Untuk Penyelidikan Melibatkan Manusia* (JKEUPM), Universiti Putra Malaysia, Serdang for information purpose after getting approval from MOH (Appendix A,B).

3.10 Data Analysis

All the statistical analysis was performed using IBM SPSS Statistics 25. Univariate analysis was used to analyze descriptive data. The results were presented as frequencies and percentages for categorical variables and a means and standard deviations for continuous variables. The bivariate analysis was used to analyze inferential data. In order to test the correlation between continuous variables, Pearson's product moment correlation was used whereas chi-square test of independence used to test the associations between categorical variables. The level of statistical significance was set at $p<0.05$.

CHAPTER 4

RESULTS AND DISCUSSION

4.0 Background

This chapter presented the results and discussion of the study that aimed to determine the associations between socio-demographic, anthropometry data, biochemical data, dietary intake, quality of life and functional status among pre-operative surgical patients in Hospital Serdang, Selangor. Interviews were conducted after obtaining the consent from the patients. Due to the current pandemic issue which is COVID-19, this study only achieved 34.5% of response rate.

4.1 Socio-demographic factors

There were 38 subjects that successfully completed all of the data required in this study as shown in methodology part. The socio-demographic factor of the pre-operative surgical patients was shown in Table 4.1. The age range of the respondents were from 18 to 70 years old with the mean of 46.6 ± 14.8 years and majority are in age range of 30 – 59 years old. Out of 38 respondents, most of them were female (68.4%) and male were only 12 people. Next, majority of the participants were Malay which recorded 31.6%, followed by Indian and Chinese with percentage of 18.4 and 10.5, respectively. In term of education level, more than half of the respondents have secondary educational level while about 23.7% of them were having tertiary education and the remaining of 18.4% were only having primary education. Apart from that, half of them are still working either as employee (39.5%) or self-employed (13.2%), while the remaining were a student (2.6%), retired (21.2%) and unemployed (23.7%). Almost half of the subjects had income per month in range between RM 0 – RM 500 (47.4%), followed by range between RM 1001 – RM 2000 (28.9%) and only 1 of them had salary > RM 3000. The monthly income of the subjects was quite low possibly due to most of them were female that

only stay at home being housewife and some were unemployed due to their uneasy of health condition.

Table 4.1: Socio-demographic factors of pre-operative surgical patients (N = 38)

	n (%)	Mean ± SD
Age, year		46.6 ± 14.8
18 – 29	6 (15.8)	
30 – 59	23 (60.5)	
60 - 70	9 (23.7)	
Gender		
Male	12 (31.6)	
Female	26 (68.4)	
Ethnicity		
Malay	27 (71.1)	
Chinese	4 (10.5)	
Indian	7 (18.4)	
Education level		
Tertiary education	9 (23.7)	
Secondary education	22 (57.9)	
Primary education	7 (18.4)	
Occupation		
Student	1 (2.6)	
Employee	15 (39.5)	
Self-employed	5 (13.2)	
Retired	8 (21.1)	
Unemployed	9 (23.7)	
Income per month		
RM 0 – RM 500	18 (47.4)	
RM 501 – RM 1000	4 (10.5)	
RM 1001 – RM 2000	11 (28.9)	
RM 2001 – RM 3000	1 (2.6)	
> RM 3000	4 (10.5)	

4.2 Anthropometry measurements

Table 4.2 showed the anthropometry measurements of pre-operative surgical patients for this study. The mean of weight, height and body mass index (BMI) of the subjects in this study were 67.4 ± 16.4 kg, 1.6 ± 0.1 m and 26.7 ± 6.7 kg/m^2 respectively. According to World Health Organization (2019), the average of BMI among the respondents in this study can be categorized as overweight.

Table 4.2: Anthropometric measurements of pre-operative surgical patients (N = 38)

	n (%)	**Mean ± SD**
Weight (kg)		67.4 ± 16.4
Height (m)		1.6 ± 0.1
BMI (kg/m^2)		26.7 ± 6.7
Underweight	3 (7.9)	
Normal	14 (36.8)	
Overweight	12 (31.6)	
Obese	9 (23.7)	

4.3 Biochemical data

Table 4.3 presented the biochemical data of the subjects in this study. For albumin, mostly the subjects are having normal albumin level with the scores of 3.6 ± 0.5 g/dL. However, the value of 3.6 g/dL was still at the bottom range of the optimum level. While for hemoglobin, the mean was 12.7 ± 1.8 g/dL with more than half of them were having normal hemoglobin. Pre-operative assessment was normally done to identify co-morbidities that may lead to patient complications during the anaesthetic, surgical, or post-operative period. Blood test was included in the assessment to assess for any anaemia or thrombocytopenia, as this may require correction pre-operatively to reduce the risk of cardiovascular events. Besides, normal

hemoglobin level before surgery is important to optimize the risk of perioperative complications and transfusion (Baron et al., 2014).

Table 4.3: Biochemical data of pre-operative surgical patients (N = 38)

	n (%)	Mean ± SD
Albumin (g/dL)		3.6 ± 0.5
Low	5 (13.2)	
Normal	33 (86.8)	
Hemoglobin (g/dL)		12.7 ± 1.8
Low	17 (44.8)	
Normal	20 (52.6)	
High	1 (2.6)	

4.4 Dietary intake

Table 4.4 showed the findings of dietary intake, which is the energy and protein intake and adequacy in this study. The mean of energy intake and protein intake were 1339 ± 532 kcal and 52 ± 31 g respectively. The mean energy adequacy and protein adequacy were around 68.2 ± 27.1% and 71.9 ± 43.8 % respectively. The mean energy and protein intake in this study were lower compared to a study using enteral nutrition therapy where their calories and proteins adequacy were 88.9 ± 12.1% and 87.9 ± 12.2% respectively (Weimann et al., 2017). The reason behind was that several patients were over fasting and some were not able to finished their meal provided by the hospital due to the taste of food besides their current illness.

Table 4.4: Dietary intake of pre-operative surgical patients (N = 38)

	Mean ± SD
Energy intake (kcal)	1339 ± 532
Energy adequacy (%)	68.2 ± 27.1
Protein intake (g)	52 ± 31
Protein adequacy (%)	71.9 ± 43.8

4.5 Quality of life

Table 4.5 showed the mean scores of the eight domains of SF-36 questionnaires for quality of life of the subjects in this study. The domain of social functioning scores the highest which was 94.4 ± 14.1 while the lowest was 55.3 ± 45.5 from the role limitations due to physical health domain. Mostly, the patients claimed that their health condition caused them easily tired thus the kind of work or other activities that can be done were limited. However, their physical health was less likely to interfere their social activities with family, friends and neighbors.

Table 4.5: Mean scores of the components of SF-36 questionnaires (N = 38)

Domain of SF-36 scores	Mean ± SD
Physical functioning	75.9 ± 23.0
Role limitations due to physical health	55.3 ± 45.5
Role limitations due to emotional problems	87.7 ± 32.4
Energy/fatigue	61.3 ± 15.6
Emotional well-being	73.5 ± 13.6
Social functioning	94.4 ± 14.1
Pain	80.6 ± 21.2

4.6 Functional status

Based on the Table 4.6, the mean of handgrip strength for the subjects in this study was 21.2 ± 8.2 kg. More than half of the subjects (55.3%) have strong hand grip strength. Next, the mean scores of male subjects (24.5 ± 12.3 kg) was higher compared to female subjects (19.7 ± 5.0 kg). When compared among the gender, approximately 65.4% of female respondents had strong HGS. On the other hand, majority of the male respondents (66.7%) had low HGS. In previous study, HGS was higher in men than women (Pengpid & Peltzer, 2018). This may be due to the unequally gender distributed of the subject in this study.

Table 4.6: Hand grip strength and functional status of pre-operative surgical patients (N = 38)

	n (%)		**Mean ± SD**
	Weak	**Strong**	
Hand grip strength (kg)	17 (44.7)	21 (55.3)	21.2 ± 8.2
Male	8 (66.7)	4 (33.3)	24.5 ± 12.3
Female	9 (34.6)	17 (65.4)	19.7 ± 5.0

4.7 Hypothesis testing

a) There was no association between socio-demographic factors with functional status among pre-operative surgical patients in Hospital Serdang

Age, gender, ethnicity, education level, occupation and income per month were analyzed for socio-demographic factors associated with functional status. Based on Table 4.7, age was negatively correlated with functional status ($r = -0.334$, $p<0.05$). This indicated that the higher the age, the lower the functional status. This is consistent with a study in Sri Lanka as declining HGS is due to the changes in age-related physical function and frailty due to the alteration of musculoskeletal, vascular, nervous and endocrine systems affecting the hand structure and lead to the weakening of hand function (Damayanthi et al., 2018).

On the other hand, other socio-demographic factors in this study found no association with functional status. Previous studies that showed association between muscle strength levels and gender justified that men have more muscle mass and higher plasma concentration of major anabolic hormones such as testosterone, GH and IGF-1 than women (Cited in (Kim et al., 2019).

Besides, a systematic review showed that high educational level contributed to greater HGS (de Lima et al., 2017). Low educational level associated with low-pay occupation and less awareness on performing physical activity to maintain health. Low income per month will lead to insufficient nutrition and exercise. Therefore, further studies are needed as these factors are interrelated and not independently associated with HGS.

The discrepancy of the findings can be explained as the patients in this study are well-known for their elective surgery, they have been taking care of themselves well regardless of their gender, ethnicity and education level.

Table 4.7: Association between socio-demographic factors with functional status (N = 38)

Socio-demographic factors	**Functional status**	
	r	***p*-value**
Age	-0.334	0.041*

*Pearson Correlation test is significant at $p<0.05$

	X^2	***p*-value**
Gender	3.412	0.065
Ethnicity	0.602	0.491
Education level	3.527	0.099
Occupation	3.273	0.100
Income per month	1.619	0.328

*Chi-square test is significant at $p<0.05$

b) There is no association between anthropometry data with functional status among pre-operative surgical patients in Hospital Serdang

Based on Table 4.8, there were no significant association between weight, height and BMI with the functional status. However, this finding was contrast with previous study which found that low height and underweight were associated with low HGS while being obese was associated with high HGS (Pengpid & Peltzer, 2018). HGS level is affected by height as greater height will lead to longer arms, with greater lever arm for force generation, resulting in an efficient amount of force (Yamada et al., 2015).

Table 4.8: Association between anthropometry data with functional status (N = 38)

Anthropometry data	**Functional status**	
	r	***p*-value**
Weight	0.239	0.149
Height	0.319	0.051
BMI	0.117	0.483

*Pearson Correlation test is significant at $p<0.05$

c) There is no association between biochemical data with functional status among pre-operative surgical patients in Hospital Serdang

Based on Table 4.9, there were no association between albumin and hemoglobin level with functional status among pre-operative surgical patients. However, previous finding among hematological malignancy patients found out a significant difference was observed (p = 0.026), with the low hemoglobin group having significantly lower values of HGS than the high hemoglobin group (p = 0.021) (Fukushima et al., 2019). The reason behind is that low hemoglobin levels cause in decreasing the oxygen level deliver to skeletal muscle, thus it is negatively affecting the muscle strength (Yamada et al., 2015).

Apart from that, the findings also contrast with previous study that found significant correlation ($p < 0.01$) between albumin level and ADL score as low albumin level indicate malnutrition status and it was found correlate with poorer functional status and hospital outcomes (Hsu et al., 2015). However, correlation between serum albumin level and functional status are still unclear whether low serum albumin level affect functional status or impaired functional status decreases the serum albumin level due to the imprecise underlying mechanism.

Table 4.9: Association between biochemical data with functional status (N = 38)

Biochemical data	**Functional status**	
	r	***p*-value**
Albumin (g/dL)	-0.029	0.863
Hemoglobin (g/dL)	0.020	0.906

*Pearson Correlation test is significant at $p<0.05$

d) There is no association between dietary intake with functional status among pre-operative surgical patients in Hospital Serdang

Based on Table 4.10, energy intake was positively correlated with functional status ($r = 0.407$, $p < 0.05$). This indicated that the higher the energy intake, the greater the functional status. However, energy adequacy, protein intake and protein adequacy were not found significantly associated with functional status. However, previous study showed that people at nutritional risk have lower HGS. Poor energy intake will cause in reduced protein synthesis, which cause muscle fiber atrophy and decreased muscle mass, hence lead to impair muscle function (S. Lee et al., 2018). The findings also inconsistent with a study in Korea where both total energy and protein were significantly correlated with HGS (S. Lee et al., 2018).

Table 4.10: Association between dietary intake with functional status (N = 38)

Dietary intake	Functional status	
	r	***p*-value**
Energy intake	0.407	0.011*
Energy adequacy	0.241	0.144
Protein intake	0.196	0.239
Protein adequacy	0.093	0.578

*Pearson Correlation test is significant at $p<0.05$

e) There is no association between quality of life with functional status among pre-operative surgical patients in Hospital Serdang

Based on Table 4.11, there is positive correlation between energy/fatigue and general health with functional status. This indicate that the higher the QOL score, the greater the functional status. However, previous study only access HGS as an indicator for QOL and it found positively correlated among elderly patient (Musalek & Kirchengast, 2017; Wiraguna & Setiati, 2018).

Table 4.11: Association between quality of life with functional status (N = 38)

Domain of SF-36 scores	Functional status	
	r	***p*-value**
Physical functioning	0.266	0.107
Role limitations due to physical health	0.203	0.221
Role limitations due to emotional problems	0.203	0.221
Energy/fatigue	0.512	0.001**
Emotional well-being	0.300	0.067
Social functioning	0.218	0.189
Pain	0.154	0.355
General health	0.365	0.024*

**Pearson Correlation test is significant at $p<0.01$

*Pearson Correlation test is significant at $p<0.05$

CHAPTER 5

CONCLUSION, LIMITATIONS AND FUTURE RECOMMENDATIONS

5.1 Conclusion

Majority of the subjects (55.3%) were having strong functional status and most of them were female (65.4%). There were significant association of age, total energy intake, energy/ fatigue and general health with functional status.

5.2 Limitations

There are several limitations that could be found in this study. This study consisted of small sample size as researcher was not able to reach calculated sample size due to the pandemic COVID-19. A better outcome would be achieved if the study is having enough and bigger sample size.

Furthermore, non-dominant hand was used to measure the HGS of the patients due to the presence of intravenous cannula on dominant hand of the subjects. Thus, this will cause in inaccurate reading of the HGS. The condition of the patients such as pain or fatigue due to their illness and fasting prior to undergo surgery will indirectly reduce their maximal capacity when performing HGS assessment.

Besides, this study was using 24-hour diet recall to assess the dietary intake of the patients. This method was failed to represent the usual daily intake of the patients. Misreporting of the portion can be occurred as every patient are having various type of tableware for eating.

5.3 Future Recommendations

Future studies with a larger sample size should be conducted to ascertain the factors related with functional status among pre-operative surgical patients. Study location can be various so that the results of the study can represent the whole population of the pre-operative patients in Malaysia. Future researchers also should focus on other confounding factors such as patients' lifestyle, physical activity and comorbidities which could affect their functional status.

Apart from that, healthcare professionals should provide nutrient intervention to the patients that found malnutrition or at risk of it. Enteral feeding or parenteral feeding can be provided to ensure they are having enough nutrition prior to undergo surgery. Thus, postoperative outcome of the patients can be improved as well.

Last but not least, study on enhanced recovery after surgery (ERAS) protocols should be conducted among this patient in the hospital. This can reduce the unnecessary fasting of the patients prior to surgery and increase the feeding time after surgery. Therefore, hospital stay period and morbidity during postoperative can be reduced and overall health of the patients can be improved.

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APPENDICES

APPENDIX A: Approval letter from MREC (English version)

JAWATANKUASA ETIKA & PENYELIDIKAN PERUBATAN
(Medical Research & Ethics Committee)
KEMENTERIAN KESIHATAN MALAYSIA
d/a Kompleks Institut Kesihatan Negara
Blok A, No 1, Jalan Setia Murni U13/52,
Seksyen U13, Bandar Setia Alam,
40170 Shah Alam, Selangor.
Tel: 03-3362 8888/8100/8205

Ref:(12)KKM/NIHSEC/ P18-1985
Date: 20-March-2019

Dr Zalina Abu Zaid
UNIVERSITY PUTRA MALAYSIA (UPM)

Dear Sir/ Mdm,

ETHICS INITIAL APPROVAL:

NMRR-18-2625-43546 (IIR)
RESUBMISSION : Effectiveness of intensive perioperative nutrition therapy among adults undergoing surgery (NMRR-18-459-40279)

This letter is made in reference to the above matter.

2. The Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia (MOH) has provided ethical approval for this study. Please take note that all records and data are to be kept strictly **CONFIDENTIAL** and can only be used for the purpose of this study. All precautions are to be taken to maintain data confidentiality. Permission from the District Health officer/Hospital Administrator/ Hospital Director and all relevant heads of departments /units where the study will be carried out must be obtained prior to the study. You are required to follow and comply with their decision and all other relevant regulations, including the Access to the Biological Resources and Benefit Sharing Act 2017.

3. The investigators involved in this study are:

HOSPITAL SERDANG
Dr Zalina Abu Zaid (Principal Investigator)
Associate Prof. Dr Mohd Faisal Bin Jabar
Dr Barakatun Nisak Mohd Yusof
Dr Nyanamalar A/P Krishnan
Ms A'shah Zafirah binti Abdul A'zim

4. The following study documents have been received and reviewed with reference to the above study:

Documents received and reviewed with reference to the above study:

1. Study Proposal Version 1, dated 11 March 2019
2. Patient Information sheet & Informed Consent Form (English) Version 2, dated 11 March 2019
3. Patient Information sheet & Informed Consent Form (BM) Version 3, dated 11 March 2019
4. Questionnaire Version 4, dated 15 August 2018
5. Investigator's documents: IAHOD, CV, GCP certificate and COI declaration :

APPENDIX B: Approval letter from MREC (BM version)

JAWATANKUASA ETIKA & PENYELIDIKAN PERUBATAN
(Medical Research & Ethics Committee)
KEMENTERIAN KESIHATAN MALAYSIA
d/a Kompleks Institut Kesihatan Negara
Blok A, No 1, Jalan Setia Murni U13/52,
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Ruj.Kami:(11)KKM/NIHSEC/ P18-1985
Tarikh: 20-March-2019

Dr Zalina Abu Zaid
UNIVERSITY PUTRA MALAYSIA (UPM)

Dato'/ Tuan/ Puan,

SURAT KELULUSAN ETIKA:

NMRR-18-2625-43546 (IIR)
RESUBMISSION : Effectiveness of intensive perioperative nutrition therapy among adults undergoing surgery (NMRR-18-459-40279)

Dengan hormatnya perkara di atas adalah dirujuk.

2. Bersama dengan surat ini dilampirkan surat kelulusan saintifik dan etika bagi projek ini. Segala rekod dan data subjek adalah SULIT dan hanya digunakan untuk tujuan kajian dan semua isu serta prosedur mengenai *data confidentiality* mesti dipatuhi. Kebenaran daripada Pengarah Hospital/Institusi di mana kajian akan dijalankan mesti diperolehi terlebih dahulu sebelum kajian dijalankan. Dato'/ Tuan/ Puan perlu akur dan mematuhi keputusan tersebut dan undang-undang lain yang berkaitan, termasuklah Akta Akses Kepada Sumber Biologi dan Perkongsian Faedah 2017.

3. Penyelidik- penyelidik yang terlibat ialah:

HOSPITAL SERDANG
Dr Zalina Abu Zaid (Penyelidik Utama)
Associate Prof. Dr Mohd Faisal Bin Jabar
Dr Barakatun Nisak Mohd Yusof
Dr Nyanamalar A/P Krishnan
Ms A'shah Zafirah binti Abdul A'zim

4. Adalah dimaklumkan bahawa kelulusan ini adalah sah sehingga 19-Mac-2020. Tuan/Puan perlu menghantar dokumen-dokumen seperti berikut selepas mendapat kelulusan etika. Borang-borang berkaitan boleh dimuat turun daripada laman web Jawatakuasa Etika & Penyelidikan Perubatan (JEPP) (http://www.nih.gov.my/mrec).

i. ***Continuing Review Form*** selewat-lewatnya dalam tempoh 2 bulan (60 hari) sebelum tamat tempoh kelulusan ini bagi memperbaharui kelulusan etika.
ii. ***Study Final Report*** pada penghujung kajian.
iii. Mendapat kelulusan etika sekiranya terdapat pindaan ke atas sebarang dokumen kajian/ lokasi kajian/ penyelidik. Pihak JEPP mempunyai hak untuk menarik balik kelulusan etika sekiranya terdapat perubahan dokumen kajian yang tidak diisytiharkan.
iv. Kajian berkenaan intervensi klinikal sahaja: Laporan mengenai ***all Serious Adverse Events (SAEs), Suspected Unexpected Serious Adverse Reaction (SUSARs)*** dan ***Protocol Deviation/Violation*** di lokasi kajian yang diluluskan oleh JEPP jika berkenaan. *SAE* perlu dilaporkan dalam tempoh 15 hari kalender dari kesedaran kejadian (*awareness of event*) oleh

APPENDIX D: Subject Information Sheet and Patient Consent Form (English version)

PARTICIPANT INFORMATION SHEET AND INFORMED CONSENT FORM
(for adult subjects)

1. **Title of study**: Associations of socio-demographic, nutritional status and quality of life with functional status among pre-operative surgical patients in public hospital.

2. **Name of investigator and institution:** Zalina Abu Zaid (Universiti Putra Malaysia), Sunitta A/P Eh Sot (Universiti Putra Malaysia)

3. **Name of sponsor**: Self-sponsored

4. **Introduction:**

   It is important that you understand why the research is being done and what it will involve. Please take your time to read through and consider this information carefully before you decide if you are willing to participate. Ask the study staff if anything is unclear or if you would like more information. After you are properly satisfied that you understand this study, and that you wish to participate, you must sign this informed consent form.

   Your participation in this study is voluntary. You do not have to be in this study if you do not want to. You may also refuse to answer any questions you do not want to answer. If you volunteer to be in this study, you may withdraw from it at any time. If you withdraw, any data collected from you up to your withdrawal will still be used for the study. Your refusal to participate or withdrawal will not affect any medical or health benefits to which you are otherwise entitled.

   This study has been approved by the Medical Research and Ethics Committee, Ministry of Health Malaysia.

5. **What is the purpose of the study?**

   The purpose of this study is to determine the association of socio-demographic, nutritional status (anthropometry measurement, biochemical data, and dietary intake) and quality of life with functional status among pre-operative surgical patients in Hospital Serdang, Selangor. This research is necessary because there are limited data on assessing functional status of pre-operative surgical patients in Malaysia. It may serve as baseline information for other studies in the future.

   This research will be conducted for duration of 3 months. The expected number of participants are 110 individuals.

6. **What are my responsibilities when taking part in this study?**

   It is important that you answer all of the questions asked by the study staff honestly and completely which will take about 35 minutes of your time. Study team will also access your medical records for your biochemical data.

You will be interviewed by the researcher using interviewer-administered questionnaire. This form contains 6 sections which will enquire about your socio-demographic, anthropometry measurements, biochemical data, dietary intake, quality of life and functional status. Your weight and height will be measured by the researcher. After that, your diet history will be assessed by the researcher. Then, you will also need to sit straightly with arms by your side of body and elbow flex at 90 degree to have researcher measure your hand grip strength.

7. What are the potential risks and side effects of being in this study?

Participation to this study will not affect your treatment, and the risk is minimal. You are free to decline to answer any of the questions that you feel uncomfortable with.

8. What are the benefits of being in this study?

There may or may not be any benefits to you. Information obtained from this study will help improve the treatment or management of other participants with the same disease or condition.

9. Who is funding the research?

This study is self-sponsored. You will not be paid for participating in this study.

10. Will my medical information be kept private?

All your information obtained in this study will be kept and handled in a confidential manner, in accordance with applicable laws and/or regulations. When publishing or presenting the study results, your identity will not be revealed without your expressed consent. Individuals involved in this study, qualified monitors and auditors, and governmental or regulatory authorities may inspect the study data, where appropriate and necessary.

11. Who should I call if I have questions?

If you have any questions about the study or if you think you have a study related injury and you want information about this study, please contact the researcher of this study, Sunitta A/P Eh Sot at telephone number 01116875279 or email to saisunitta@gmail.com. You may also contact the researcher's supervisor, Dr. Zalina bt Abu Zaid at telephone number 03-86092961.

If you have any questions about your rights as a participant in this study, please contact: The Secretary, Medical Research & Ethics Committee, Ministry of Health Malaysia, at telephone number 03-3362 8407/8205/8888/8100.

INFORMED CONSENT FORM

Title of Study: Associations of socio-demographic, nutritional status and quality of life with functional status among pre-operative surgical patients in public hospital.

By signing below, I confirm the following:

- I have been given oral and written information for the above study and have read and understood the information given.
- I have had sufficient time to consider participation in the study and have had the opportunity to ask questions and all my questions have been answered satisfactorily.
- I understand that my participation is voluntary and I can at anytime free withdraw from the study without giving a reason and this will in no way affect my future treatment. I am not taking part in any other research study at this time. I understand the risks and benefits, and I freely give my informed consent to participate under the conditions stated. I understand that I must follow the study doctor's (investigator's) instructions related to my participation in the study.
- I understand that study staff, qualified monitors and auditors, the sponsor or its affiliates, and governmental or regulatory authorities, have direct access to my medical record in order to make sure that the study is conducted correctly and the data are recorded correctly. All personal details will be treated as STRICTLY CONFIDENTIAL
- I will receive a copy of this subject information/informed consent form signed and dated to bring home.
- I agree/disagree* for my family doctor to be informed of my participation in this study. *(*delete which is not applicable)*

Subject:

Signature: I/C number:

Name: Date:

Investigator conducting informed consent:

Signature: I/C number:

Name: Date:

Impartial witness:

Signature: I/C number:

Name: Date:

APPENDIX E: Subject Information Sheet and Patient Consent Form (BM version)

RISALAH MAKLUMAT PESERTA DAN
BORANG PERSETUJUAN atau KEIZINAN PESERTA
(untuk subjek dewasa)

1. **Tajuk penyelidikan**: Penghubungkait antara faktor-faktor socio-demografi, status pemakanan dan kualiti kehidupan dengan status fungsi keupayaan dalam kalangan pesakit sebelum pembedahan di hospital awam.

2. **Nama Institusi and nama penyelidik:** Zalina Abu Zaid (Universiti Putra Malaysia), Sunitta A/P Eh Sot (Universiti Putra Malaysia)

3. **Nama penaja**: Tajaan sendiri

4. **Pengenalan:**

   Risalah ini menjelaskan hal-hal berkenaan penyelidikan tersebut dengan lebih mendalam dan terperinci. Amat penting anda memahami mengapa penyelidikan ini dilakukan dan apa yang dilakukan dalam penyelidikan ini. Sila ambil masa yang secukupnya untuk membaca dan mempertimbangkan dengan teliti penerangan yang diberi sebelum anda bersetuju untuk menyertai penyelidikan ini. Jika ada sebarang kemusykilan ataupun maklumat lanjut yang anda ingin tahu, anda boleh bertanya dengan mana-mana kakitangan yang terlibat dalam penyelidikan ini. Setelah anda berpuas hati bahawa anda memahami penyelidikan ini, dan anda berminat untuk turut serta, anda dikehendaki untuk menandatangani Borang Persetujuan atau Keizinan Peserta, pada muka surat akhir risalah ini.

   Penyertaan anda dalam penyelidikan ini adalah secara sukarela. Anda tidak perlu menyertai penyelidikan ini jika anda tidak mahu. Anda juga mempunyai hak untuk tidak menjawab mana-mana soalan yang anda tidak mahu jawab. Anda juga boleh menarik diri daripada penyelidikan ini pada bila-bila masa sahaja. Jika anda menarik diri, segala maklumat yang telah diperolehi sebelum anda menarik diri tetap akan digunakan dalam penyelidikan ini. Jika anda tidak mahu menyertai ataupun menarik diri dari penyelidikan ini, tindakan anda tidak akan menjejaskan segala hak dan keistimewaan perubatan kesihatan yang selayaknya anda terima.

   Penyelidikan ini telah mendapat kelulusan Jawatankuasa Etika dan Penyelidikan Perubatan, Kementerian Kesihatan Malaysia.

5. **Apakah tujuan penyelidikan ini dilakukan?**

   Tujuan penyelidikan ini dilakukan adalah untuk mengenal pasti penghubungkait antara sosio-demografi, status pemakanan (ukuran antropometri, data biokimia, dan pengambilan makanan) dan kualiti kehidupan dengan status fungsi keupayaan dalam kalangan pesakit sebelum pembedahan di hospital awam. Penyelidikan ini diperlukan kerana terdapat data berkaitan penilaian status fungsi keupayaan dalam kalangan pesakit sebelum pembedahan di Malaysia yang terhad. Ia dapat memberikan pemahaman yang lebih lanjut untuk intervensi pada masa akan datang.

Penyelidikan ini akan berlangsung selama 3 bulan. Dijangka bahawa 110 individu akan mengambil bahagian dalam kajian ini.

6. Apakah tanggungjawab saya sewaktu menyertai penyelidikan ini?

Amat penting anda menjawab kesemua soalan yang dikemukakan oleh kakitangan penyelidikan dengan jujur dan lengkap yang akan mengambil masa selama 30 minit. Penyelidik juga memerlukan maklumat seperti data biokimia daripada rekod perubatan anda.

Pertama sekali, anda akan ditanya oleh penyelidik untuk melengkapkan borang soal selidik. Borang tersebut merangkumi 6 bahagian iaitu info sosio-demografi, ukuran antropometri, data biokimia, pengambilan diet, kualiti kehidupan dan keupayaan fungsi badan. Ukuran antropometri akan dijalankan untuk memperoleh berat badan dan tinggi anda. Anda juga akan diminta untuk duduk tegak dan meletakkan siku bersudut 90° untuk mendapatkan ukuran kekuatan pegangan anda.

7. Apakah manfaatnya saya menyertai kajian ini?

Penyelidikan ini mungkin akan mendatangkan manfaat ataupun langsung tiada memberi apa-apa manfaat kepada anda. Segala maklumat yang diperolehi daripada penyelidikan ini akan dapat membantu dalam penambahbaikan kaedah rawatan atau pengurusan pesakit lain yang mengidap penyakit atau masalah kesihatan yang sama dengan anda.

8. Apakah risiko dan kesan-kesan sampingan menyertai penyelidikan ini?
Risiko untuk penyertaan penyelidikan ini yang adalah minima dan tidak akan menjejaskan rawatan anda. Anda berhak untuk tidak menjawab jika rasa tidak selesa dengan mana-mana soalan kajian.

9. Siapakah yang membiayai penyelidikan ini?

Kajian ini adalah tajaan sendirian oleh penyelidik. Anda tidak akan dibayar untuk menyertai kajian ini.

10. Adakah maklumat saya akan dirahsiakan ?

Segala maklumat anda yang diperolehi dalam penyelidikan ini akan disimpan dan dikendalikan secara sulit, bersesuaian dengan peraturan-peraturan dan/ atau undang-undang yang berkenaan. Sekiranya hasil penyelidikan ini diterbitkan atau dibentangkan kepada orang ramai, identiti anda tidak akan didedahkan tanpa kebenaran anda terlebih dahulu.

Pihak-pihak tertentu seperti individu yang terlibat dalam penyelidikan ini, juruaudit dan jurupantau yang terlatih, pihak berkuasa kerajaan atau undang-undang, boleh memeriksa maklumat atau data kajian jika diperlukan.

11. Siapakah yang perlu saya hubungi sekiranya saya mempunyai sebarang pertanyaan?

Anda boleh menghubungi penyelidik, Sunitta A/P Eh Sot pada nombor telefon 011-16875279 atau emel ke saisunitta@gmail.com sekiranya anda mempunyai sebarang

pertanyaan mengenai penyelidikan ini atau jika anda mengesyaki anda mengalami kecederaan yang terhasil daripada penyelidikan ini dan anda mahukan maklumat tentang rawatannya. Anda juga boleh menghubungi pemantau penyelidikan, Dr. Zalina binti Abu Zaid, 03-8609 2961.

Jika anda mempunyai sebarang pertanyaan berkaitan dengan hak-hak anda sebagai pesakit dalam penyelidikan ini, sila hubungi: Setiausaha, Jawatankuasa Etika & Penyelidikan Perubatan, Kementerian Kesihatan Malaysia, melalui talian telefon 03-3362 8407/8205/8888.

BORANG PERSETUJUAN/ KEIZINAN PESERTA

Tajuk Penyelidikan : Penghubungkait antara faktor-faktor socio-demografi, status pemakanan dan kualiti kehidupan dengan status fungsi keupayaan dalam kalangan pesakit sebelum pembedahan di hospital awam.

Dengan menandatangani di bawah, saya mengesahkan bahawa :

- Saya telah diberi maklumat tentang penyelidikan di atas secara lisan dan bertulis and saya telah membaca dan memahami segala maklumat yang diberikan dalam risalah ini.
- Saya telah diberikan masa yang secukupnya untuk mempertimbangkan penyertaan saya dalam penyelidikan ini dan telah diberi peluang untuk bertanyakan soalan dan semua persoalan saya telah dijawab dengan sempurna dan memuaskan.
- Saya juga faham bahawa penyertaan saya adalah secara sukarela dan pada bila-bila masa saya bebas menarik diri daripada penyelidikan ini tanpa harus memberi sebarang alasan dan ianya sama sekali tidak akan menjejaskan rawatan perubatan saya pada masa akan datang. Saya tidak mengambil bahagian dalam mana-mana penyelidikan lain pada masa ini. Saya juga memahami tentang risiko dan manfaat penyelidikan ini dan saya secara sukarela memberi persetujuan untuk menyertai penyelidikan ini di bawah syarat-syarat yang telah dinyatakan di atas. Saya faham saya harus mematuhi nasihat dan arahan yang berkaitan dengan penyertaan saya dalam penyelidikan ini daripada doktor penyelidikan (penyelidik) .
- Saya faham bahawa kakitangan penyelidikan, pemantau dan juruaudit terlatih , pihak penaja atau gabungannya, dan pihak berkuasa kerajaan atau undang-undang, mempunyai akses langsung dan boleh menyemak laporan perubatan saya bagi memastikan penyelidikan ini dijalankan dengan betul dan data direkodkan dengan betul. Segala maklumat dan data peribadi akan dianggap sebagai SULIT.
- Saya akan menerima satu salinan 'Risalah Maklumat Pesakit dan Borang Persetujuan atau Keizinan Pesakit' yang telah lengkap dengan tarikh dan tandatangan untuk dibawa pulang ke rumah.
- Saya bersetuju/ tidak bersetuju* untuk doktor yang merawat keluarga saya diberitahu tentang penyertaan saya dalam penyelidikan ini. *(*Potong mana yang tidak berkenaan)*

Subjek :

Tandatangan: Nombor K/P:

Nama: Tarikh :

<u>Penyelidik yang mengendalikan proses menandatangani borang keizinan:</u>

Tandatangan: Nombor K/P:

Nama: Tarikh :

<u>Saksi tidak-berpihak/adil:</u>

Tandatangan: Nombor K/P:

Nama: Tarikh :

APPENDIX F: Questionnaire

CONFIDENTIAL*/ **SULIT*

Reference Number

QUESTIONNAIRE

BORANG SOAL SELIDIK

Associations of socio-demographic, nutritional status and quality of life with functional status among pre-operative surgical patients in public hospital.

Penghubungkait antara faktor-faktor socio-demografi, status pemakanan dan kualiti kehidupan dengan fungsi keupayaan dalam kalangan pesakit sebelum pembedahan di hospital awam.

Supervisor/Pemantau: DR. ZALINA BINTI ABU ZAID

Researcher/Penyelidik: SUNITTA A/P EH SOT

SECTION A/ *BAHAGIAN A*

Fill in the blank or tick the boxes for the questions below. / *Isi tempat kosong atau tandakan kotak yang berkenaan untuk soalan-soalan di bawah.*

No/ *Bil*	Information/ *Maklumat*	Options/ *Pilihan*
1	Date of birth/ *Tarikh lahir*	___ ___ / ___ ___ / ___ ___ ___ ___ dd/ *hh* mm/ *bb* yyyy/ *tttt*
2	Age/ *Umur*	___ ___ years old/ *tahun*
3	Gender/ *Jantina*	□ Male/ *Lelaki* □ Female/ *Perempuan*
4	Ethnicity/ *Kaum*	□ Malay/ *Melayu* □ Chinese/ *Cina* □ Indian/ *India* □ Others/ *Lain-lain* Please specify/ *Sila nyatakan*: ……
5	Educational level/ *Tahap pendidikan*	□ Tertiary Education/ *Pendidikan Tertiari* □ Secondary Education/ *Sekolah Menengah* □ Primary Education/ *Sekolah Rendah* □ No Formal Education/ *Tiada Pendidikan Formal*
6	Occupation/ *Pekerjaan*	□ Student/ *Pelajar* □ Employee/ *Pekerja* □ Self-employed/ *Bekerja sendiri* □ Retired/ *Bersara* □ Unemployed/ *Tidak bekerja*
7	Income per month/ *Pendapatan sebulan*	□ RM 0 – RM500 □ RM 501 – RM 1000 □ RM 1001 – RM 2000 □ RM 2001 – RM 3000 □ > RM 3000

SECTION B/ *BAHAGIAN B*

ANTHROPOMETRIC MEASUREMENTS/ *UKURAN ANTROPOMETRI* (Will be filled by the researcher/ *Akan diisi oleh penyelidik*)

1.	Weight/ Berat		
	1st reading/ *Bacaan pertama* (kg)	2nd reading/ *Bacaan kedua* (kg)	Average reading (kg)
2.	Height/ *Tinggi* (m)		
3.	Body Mass Index (kg/m^2)		

SECTION C/ *BAHAGIAN C*

HANDGRIP STRENGTH/ *KEKUATAN PEGANGAN TANGAN* (Will be filled by the researcher/ *Akan diisi oleh penyelidik*)

	1st reading/ *Bacaan pertama* (kg)	2nd reading/ *Bacaan kedua* (kg)	3rd reading/ *Bacaan ketiga* (kg)
Dominant hand/ *Tangan dominan*			

SECTION D/ *BAHAGIAN D*

BIOCHEMICAL DATA/ *DATA BIOKIMIA* (Will be filled by the researcher/ *Akan diisi oleh penyelidik*)

1.	Albumin (g/dL)	
2.	Hemoglobin (g/dL)	

SECTION E/ *BAHAGIAN E*

24-HOUR DIET RECALL/ *24-JAM PENGAMBILAN DIET* (Will be filled by the researcher/ *Akan diisi oleh penyelidik*)

Time/ *Masa*	Food item/ *Item makanan*	Amount/ *Jumlah*

SECTION F/ *BAHAGIAN F*

QUALITY OF LIFE (SF-36 Questionnaire) (Will be filled by the researcher/ *Akan diisi oleh penyelidik*)

Please answer the 36 questions of the Health Survey completely, honestly, and without interruptions.

GENERAL HEALTH:

1. In general, would you say your health is:

□ Excellent

□ Very good

□ Good

□ Fair

□ Poor

2. **Compared to one year ago,** how would you rate your health in general now?

□ Much better now than one year ago

□ Somewhat better now than one year ago

□ About the same

□ Somewhat worse now than one year ago

□ Much worse than one year ago

LIMITATIONS OF ACTIVITIES:

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
3. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports.			
4. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf			
5. Lifting or carrying groceries			

6. Climbing **several** flights of stairs			
7. Climbing **one** flight of stairs			
8. Bending, kneeling, or stooping			
9. Walking **more than a mile**			
10. Walking **several blocks**			
11. Walking **one block**			
12. Bathing or dressing yourself			

PHYSICAL HEALTH PROBLEMS:

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

	Yes	No
13. Cut down the **amount of time** you spent on work or other activities		
14. **Accomplished less** than you would like		
15. Were limited in the **kind** of work or other activities		
16. Had **difficulty** performing the work or other activities (for example, it took extra effort)		

EMOTIONAL HEALTH PROBLEMS:

During the **past 4 wee**ks, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

	Yes	No
17. Cut down the **amount of time** you spent on work or other activities		
18. **Accomplished less** than you would like		
19. Didn't do work or other activities as **carefully** as usual		

SOCIAL ACTIVITIES:

20. During the **past 4 weeks**, to what extend has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

- Not at all
- Slightly
- Moderately
- Quite a bit
- Extremely

PAIN:

21. How much **bodily** pain have you had during the **past 4 weeks**?

- None
- Very Mild
- Mild
- Moderate
- Severe
- Very Severe

22. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

- Not at all
- A little bit
- Moderately
- Quite a bit
- Extremely

ENERGY AND EMOTIONS:

These questions are about how you feel and how things have been with you **during the last 4 weeks.** For each question, please give the answer that comes closest to the way you have been feeling.

	All of the time	Most of the time	A good bit of the time	Some of the time	A little bit of the time	None of the time
23. Did you feel full of pep?						
24. Have you been a very nervous person?						
25. Have you felt so down in the dumps that nothing could cheer you up?						
26. Have you felt calm and peaceful?						
27. Did you have a lot of energy?						
28. Have you felt downhearted and blue?						
29. Did you feel worn out?						
30. Have you been a happy person?						
31. Did you feel tired?						

SOCIAL ACTIVITIES:

32. During the **past 4 weeks**, how much of the time has **your physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

- All of the time
- Most of the time
- Some of the time
- A little bit of the time
- None of the Time

GENERAL HEALTH:

How true or false is each of the following statements for you?

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
33. I seem to get sick a little easier than other people					
34. I am as healthy as anybody I know					
35. I expect my health to get worse					
36. My health is excellent					