Assessment Nutritional Status of Elderly People at Old Folk Home in Klang Valley: A Cross-Sectional Study

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Abstract
Background & Aims: Undernutrition has a detrimental effect on health, especially in elderly individuals. Early detection of malnutrition and malnutrition risk allows for timely prevention and initiation of the necessary nutritional support. The study aimed to determine the prevalence of malnutrition among elderly residents at the old folk home in Selangor, Malaysia. Materials and methods: A total of 46 Klang valley nursing facility residents were enrolled for this cross-sectional study. The Mini Nutritional Assessment-Short Form (MNA-SF), 24-hour food recall, Food frequency questionnaire, Habitual physical activity, 24-hours physical activity recall, and anthropometric measurements were used to assess malnutrition by a trained healthcare professional. Results: Of the 46 participants, 41% had adequate nutrition, 11% had malnutrition, and 48% had malnutrition risk. According to BMI, 6.7% of the population was underweight, 35.6% were overweight, 11.1% were obese, and 46.7% were normal weight. The energy consumption was 2453.9 (±421.6) kcal for female residents and 2248.2 (±536.5) kcal for male residents, which was higher than the Recommended Nutrient consumption (RNI). Contrary to the cereals and grains category, it was determined that enough fruits and vegetables were consumed, as advised by the Food Pyramid. Consumption of milk and dairy products was higher than suggested by the Food Pyramid. Among older adults who are sedentary and inactive, results showed a higher incidence of malnutrition than those who were at risk for it. The amount of daily energy consumed surpassed the RNI, and the elderly did not consume enough of the food groups as advised by the Food Pyramid.

Keywords:
Geriatrics, Elderly, Malnutrition, Klang Valley, Nutrition
Introduction

The United Nations defines an older person as an individual who is over 60 years of age. Similarly, Malaysia has adopted the same terminology to describe older people (Department of Social Welfare, 2012). Globally, the population is ageing, and the World Health Organisation (WHO) predicts that, by 2050, the population aged 60 years or more will double. This lifespan extension is seen as a triumph of medical advances arising from access to better treatments and a focus on preventive therapies (Evangelista et al., 2014).

In 2019, 10.3% of the Malaysian population was aged 60 years and over, about 3.4 million of the 32.6 million Malaysian population (Department of Statistics Malaysia, 2019). By 2040, the ageing population in Malaysia is expected to cover 20% of the Malaysian population, which is about 6.3 million (Social Wellbeing Research Centre, 2019). Due to working adults in the family being unable to care for their elderly parents, the demand for assistance and healthcare for older people is rising as the population ages quickly. As a result, there is a growing demand for old folk homes to meet this demand, particularly in urban regions like Kuala Lumpur, Selangor, Johor, and Penang (Hoe et al., 2018). These institutions are mostly managed by NGOs, the private sector, or the Department of Social Welfare. In all regions of Malaysia, the Department of Social Welfare reported 1473 approved registered care centers in 2015, with 1019 centers coming from private organizations while 454 coming from non-profits.

The government constructed Rumah Seri Kenangan (RSK), which is one of the senior homes to give proper care and protection to the elderly poor who lack family and financial assistance. Ten RSKs have been developed in various states in Malaysia, including Perlis, Perak, Selangor, Negeri Sembilan, Melaka, Johor, Kelantan, and Kedah. RSK is unique compared to other nursing facilities because its residents are typically more independent. However, because most elderly people live in poverty and isolation before admission, malnutrition is probably still significant and at risk (Visvanathan et al., 2005).

Poor nutritional status and malnutrition in the elderly population in old folk homes are important areas of concern. Therefore, assessing the nutritional status is essential to determine the health risks among the elderly, commonly malnutrition associated with other diseases (Shahar et al., 2001). The prevalence of malnutrition has been reported to be 50% and higher in nursing home residents, geriatric patients in acute care hospitals, and geriatric rehabilitation (Kaiser et al. 2010; Cereda, 2012; Kruizenga et al. 2016; Roger et al. 2016; Van Zwienen-Pot et al. 2016). In residential institutions, 12.3 to 17.4% of the elderly were reported to be malnourished, according to earlier Malaysian surveys (Abdul Aziz et al., 2019; Mohd Shahrin et al., 2019; Chen et al., 2012; Visvanathan et al., 2005). At the same time, between 32.1% and 40.3% of elderly living in nursing facilities are in danger of malnutrition (Mohd Shahrin et al., 2019; Visvanathan et al., 2005).

Malnutrition leads to a deterioration of health and functional status with increased dependency and disability (Visser et al., 2017). Kiesswetter et al. (2012) have highlighted the relationship between nutritional deficits and functional impairments. Consumption of energy below body requirements with pre-existing weight loss worsens the age-related loss of muscle mass and physical functions (Newman et al. 2005; Ritchie et al. 2008). Therefore, malnutrition is a critical aetiological factor that affects the gradual loss of muscle mass, strength, functions, and frailty, the most common geriatric problem among older people.

In recent years, treating nutritional issues among older persons has drawn more scientific attention. Nevertheless, many uncertainties remain unsolved, for instance, the lack of an optimal screening tool to identify malnourished persons and the effectiveness of nutritional interventions (Health Council of the Netherlands, 2011). Poor nutritional care is still prevalent in many healthcare settings, including medical staff, elderly patients, and their loving families, despite the authority’s numerous intervention efforts (Monteagudo et al., 2015; Zylan et al., 2015; Craven et al., 2016). Alarmingly, numerous nutritional and health issues arise in the latter stages of aging, necessitating an upgrade in facilities and rehabilitation services for this vulnerable age group (Chilima & Ismail, 1998; Cho et al., 2004; Gavazzi et al., 2004; Jitapunkul et al., 2003; Shahar et al., 2001; Suzana et al., 2002).

In addition to raising mortality and morbidity, malnutrition in older persons accelerates physical aging, impacting daily activities and overall quality of life. As higher age is one risk factor for developing a
disease, older adults have the highest risk of becoming malnourished. In order to start nutritional interventions, it is necessary to address malnutrition issues by employing appropriate screening techniques that assist in the early identification of older persons who are malnourished or at risk of becoming malnourished. Hence, this study is conducted to determine the prevalence of malnutrition and malnutrition risks at an old folk home in the Klang Valley area. In addition, this study sought to identify the physical patterns of elderly residents in old folk's homes in the Klang Valley region and evaluate their nutrient and calorie intake.

**Materials & Methods**

**Setting and sample:** The cross-sectional study was conducted from August to January 2019. About 119 elderly people who were 60 or older and residing in the old folk's home in the Klang valley were chosen for the study using the convenient sampling technique. The exclusion criteria were: 1- staying temporarily or living in the institution for < 1 month, 2- the presence of oedema (noticeable swelling of any part of the body due to accumulation of excessive fluid in the tissue), kyphosis (abnormal curvature of the spine causing hunchback), those who are terminally ill, bedridden or having severe dementia. 3-not willing to take part in the study.

The sample size was calculated using the Cochran Formula with $N=336$, a confidence level of 95%, power of 80%, and difference between proportions of 30% and gives $n=75$. However, for a smaller sample size, 46 minimum sample size is required (Cochran, 1977).

**Instruments:** The questions that were presented to the respondents were related to: A) sociodemographic information while the respondent’s nutritional status was assessed using the B) Mini Nutritional Assessment (MNA), C) dietary intake 24-hour Diet Recall, D) Food Frequency Questionnaire (FFQ). The physical activity pattern was evaluated using the E) Habitual Physical Activity and 24-Hour Physical Activity Questionnaire and F) Anthropometry measurement. The researcher administered the questionnaire via face-to-face interviews and recorded responses in the questionnaire booklet.

**Form A: Sociodemographic**

This form contains questions on the respondents' identity, and sociodemographic data such as gender, ethnicity, marital status, and literacy. This questionnaire aims to classify the respondents according to the sociodemographic characteristics of malnutrition and malnutrition risks among elderly people in shelter homes.

The demographic data and the anthropometry form consists of information about the participants, such as name, weight, and height. The measurements were measured three times using the standard techniques. Height was measured using standard portable techniques. Participants were instructed to be barefoot, legs straight, shoulders relaxed, and look straight ahead at the horizontal plane (Robert & David, 2007). Mid-upper arm circumference (MUAC) and calf circumference (CC) were measured using a non-stretchable measuring tape. The weight was measured with a portable electronic weighing scale. The participant was informed to wear minimum clothing and stand still on the scale's platform.

The body mass index (BMI) was calculated using the following equation: weight in kilogram divided by height in meter square = weight (kg) / height (m)². Body mass index (BMI) classification is defined as underweight if the BMI score is less than 18.5 kg/m²; normal with a BMI range between 18.5-24.9 kg/m²; overweight with a BMI range between 25.0-29.9 kg/m²; and obese with BMI equal or more than 30 kg/m² (Ministry of Health Malaysia, 2003; WHO, 2006).

**Form B: Mini Nutritional Assessment (MNA)**

This section contains eighteen questions consisting of several parameters regarding dietary intake, personal health history, and anthropometric measurements. According to Nestle Nutrition Institute, Mini Nutritional Assessment (MNA) is the most well-validated nutrition screening tool for the elderly. Hence, MNA has been widely used as an assessment tool to determine malnutrition and malnutrition risks (Sakineh et al., 2011; Chan et al., 1997; Hsu et al., 2003). The anthropometric measurements include weight in kilogram, height, Mid Upper Arm Circumference (MUAC), and Calf Circumference (CC) in
centimeters. The total score for the full MNA falls between 0 and 30, with 24 points and higher indicating a well-nourished patient, 17 to 23.5 indicating a risk of malnutrition, and lower than 17 points indicating malnourishment of the participant.

This form has been used by the Ministry of Health Malaysia in research on the Malaysian Adult Nutrition Survey in 2003 (Malaysian Adult Nutrition Survey, 2003). It consists of the date of the interview and the day the respondent recalled their diet intake within the week. All food and beverages consumed on the recalled day were recorded in the tables according to the time taken, type of food eaten, characteristics of the food, quantity consumed, and the amount eaten for each food.

**Form D: Food Frequency Questionnaire (FFQ)**

The Food Frequency Questionnaire (FFQ) is another common tool researchers use to assess nutritional status in large epidemiologic studies because of its effectiveness in measuring long-term diet, quick and inexpensive, besides providing quantitative information on nutrients and foods (FAO, 2018). This study retrieved the questionnaire from the Malaysian Adult Nutrition Survey 2003 by the Ministry of Health Malaysia. By determining the diet intakes, interventions on healthier diet routines can be scheduled for a proper nutritionally balanced as suggested by the Malaysian Dietary Guideline for the elderly (Tee, 2011).

**Form C: 24-hour Diet Recall**

This form has been used by Ministry of Health Malaysia in research on Malaysian Adult Nutrition Survey which was done in 2003 (Malaysian Adult Nutrition Survey, 2003). It consists of the date of interview and the day the respondent recalled their diet intake within the week. All food and beverages consumed on the recalled day were recorded in the tables according to the time taken, type of food eaten, characteristics of the food, quantity consumed and the amount eaten for each food.

**Form E: Habitual Physical Activity and 24-Hour Physical Activity**

This form is retrieved from Malaysian Adult Nutrition 2003. Part 1 comprises a brief habitual physical activity questionnaire, while Part 2 comprises a 24-hour physical activity recall form. The questions are designed to complement a brief habitual physical activity and to provide information on daily physical activity at the shelter home, including walking, climbing stairs, and lying down. Apart from that, the questionnaire also be designed to obtain information on the types, frequency, and duration of the three most frequent exercises carried out within the prior week of the interview. Meanwhile, Part 2 consists of a table format that focuses on physical activity and body position when the activities are carried out. The respondents were asked to recall all activities done on a day starting from midnight of the previous day until midnight of the day within the week. Activities were recorded at five-minute intervals to obtain a full one-day physical activity pattern by classifying them into three categories of the intensity of activity, namely light, moderate, or vigorous-intensity activities (Ainsworth et al., 2000).

The written ethical approval has been obtained from the Medical Research Ethics Committee of Management and Science University, Shah Alam, with code ethics: MSU-RMC-02/FR01/08/L1/059. Permission to conduct this study at Rumah Seri Kenangan Cheras was also obtained from the Department of Social Welfare Malaysia through an online application on the portal Aplikasi MyResearch.

Before collecting the data, verbal consent was obtained from the respondents to get their permission to participate in this study. All procedures that would be performed for the research were explained to the respondents. Respondents’ information was kept confidential by the researcher, and respondents were reminded that they were free to be excluded from this study at any time.

Data were analyzed using SPSS (Statistical Package for Social Sciences) version 18. The qualitative variables were: gender, marital status, and level of education, whereas the quantitative variables were: age, mealtimes, anthropometric measures, and BMI. Qualitative variables were described by frequencies and percentages. Quantitative variables were expressed by means and standard deviations (SD). The Chi-square test was conducted to determine the association between malnutrition (malnutrition and over-nutrition) indicators and sociodemographic characteristics (e.g., gender, age group, ethnicity, marital,
literacy, and smoking status). Analysis of variance (ANOVA) with Bonferroni procedures was used to test for differences in mean body weight, height, BMI, MUAC, and WC across age groups for both genders. The significance level used was p<0.05 for all the statistical tests.

**Results**

A total of 46 elderly participated in this study, where 60.9% of them were male, and 39.1% were female. The mean age of the male subjects was 71.6±4.3 years and 73.6±6.9 years for female subjects. Most subjects who participated in this study were majority Malays (78.3%), with the highest percentage for both males and females, where 71.4% were male and 88.9% were female. The study also showed that most of the residents were illiterate. Elderly males who were illiterate are 60.7%, meanwhile, females are 60.95. Among female subjects, none were either smoking or ever smoked before. Most of the male subjects are non-smokers. However, 32.1% are currently smoking. Anthropometric measurements measured respondents’ weight and standing height and calculated body mass index. The mean weight of male subjects was 61.0±11.0 kg and 58.5±14.2 kg. The body mass index of male subjects recorded an average of 24.0±4.1 kg/m² and 25.0±4.9 kg/m² for female subjects. Table 4.1 demonstrates the results of the sociodemographic background of the elderly residing in an old folk home in the Klang Valley area.

Table 4.1: Socio-demographic characteristics and anthropometric measurements according to gender (presented as number (%) or mean±SD and p values)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Men (n=28) n (%), mean±SD</th>
<th>Women (n=18) n (%), mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>71.6±4.3</td>
<td>73.6±6.9</td>
</tr>
<tr>
<td>Age group (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-69</td>
<td>10 (35.7)</td>
<td>4 (22.2)</td>
</tr>
<tr>
<td>70-79</td>
<td>17 (60.7)</td>
<td>11 (61.1)</td>
</tr>
<tr>
<td>≥80</td>
<td>1 (3.6)</td>
<td>3 (16.7)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>20 (71.4)</td>
<td>16 (88.9)</td>
</tr>
<tr>
<td>Chinese</td>
<td>3 (10.7)</td>
<td>1 (5.6)</td>
</tr>
<tr>
<td>Indian</td>
<td>4 (14.3)</td>
<td>1 (5.6)</td>
</tr>
<tr>
<td>Others</td>
<td>1 (3.6)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>15 (53.6)</td>
<td>4 (22.2)</td>
</tr>
<tr>
<td>Married</td>
<td>0 (0.0)</td>
<td>2 (11.1)</td>
</tr>
<tr>
<td>Divorced</td>
<td>8 (28.6)</td>
<td>2 (11.1)</td>
</tr>
<tr>
<td>Widowed</td>
<td>5 (17.9)</td>
<td>10 (55.6)</td>
</tr>
<tr>
<td>Literacy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literate</td>
<td>11 (39.3)</td>
<td>7 (39.1)</td>
</tr>
<tr>
<td>Illiterate</td>
<td>17 (60.7)</td>
<td>28 (60.9)</td>
</tr>
<tr>
<td>Smoking status**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current smoker</td>
<td>9 (32.1)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Ex-smoker</td>
<td>7 (25.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>12 (42.9)</td>
<td>18 (100)</td>
</tr>
<tr>
<td>Anthropometric</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>61.0±11.0</td>
<td>58.5±14.2</td>
</tr>
<tr>
<td>Standing height (cm)*</td>
<td>159.7±9.0</td>
<td>150.0±8.2</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>24.0±4.1</td>
<td>25.0±4.9</td>
</tr>
</tbody>
</table>

*p<0.05, independent t test  
**p<0.05, Pearson chi-square test
Figure 4.1 shows the prevalence of malnutrition and malnutrition risk in residents at old folk home in the Klang valley area. In this study, a total number of 46 elderlies were recruited. Based on the result, it is found that 48% are at risk of malnutrition. While there is 41% are well-nourished, and 11% are malnourished. Below are the details of the results in Figure 4.1.

Figure 4.1: Prevalence of malnutrition and risk of malnutrition in elderly residents of studied old folk home in the Klang Valley area.

The energy intake of the elderly was calculated daily on a particular day by assessing a 24-hour food recall questionnaire. Each meal consumed within 24 hours was recorded, and the total calorie intake was calculated. Within the respondents, the daily energy intake of older men and women differs. The older men in old folk home consumed approximately 2453.9±421.6 kcal per day. Meanwhile, elderly females consumed approximately 2248.2±536.5 kcal.

Table 4.2 shows the consumption of food groups per day and food pyramid recommendations. The number of servings of cereals and grains consumed per day by elderly residents is 3.4. However, the Food pyramid recommends four servings daily for the elderly 60 and above. The serving does not meet the Food Pyramid recommendation.

Unlike the fruits group, the serving meets the Food Pyramid recommendation with 2.45 servings daily. Servings of vegetables also meet the Food pyramid recommendation of 3.10 servings daily.

Excess of servings compared to food pyramid recommendation are shown by meat (poultry), fish and legumes group and milk and dairy products group. Meat (poultry), fish, and legumes are excessively served at 4.54 compared to 2 servings preferred by the Food Pyramid. Milk and dairy products are served in two servings compared to 1 serving recommended by the Food pyramid.
Figure 4.2 results from the physical activity level of elderly residents at an old folk home in Klang Valley. The physical activity level of residents living in old folk home is highly sedentary, with 34.8% for female and 32.6% for male respondents. Meanwhile, 26% of males and 6.5% of females were moderately active in physical activities while residing at the old folk home. None of the residents are vigorously active in physical activities.

Table 4.3: Food group consumptions per day and food pyramid recommendation

<table>
<thead>
<tr>
<th>Food group</th>
<th>Food pyramid recommendation</th>
<th>No. of servings per day</th>
<th>Meet Food Pyramid recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals and grains</td>
<td>4 servings</td>
<td>3.40</td>
<td>No</td>
</tr>
<tr>
<td>Fruits</td>
<td>2 servings</td>
<td>2.45</td>
<td>Yes</td>
</tr>
<tr>
<td>Vegetables</td>
<td>3 servings</td>
<td>3.10</td>
<td>Yes</td>
</tr>
<tr>
<td>Meat/poultry, Fish and Legumes</td>
<td>2 servings</td>
<td>4.54</td>
<td>Excess</td>
</tr>
<tr>
<td>Milk and dairy products</td>
<td>1 serving</td>
<td>2</td>
<td>Excess</td>
</tr>
</tbody>
</table>

According to the BMI calculation, 46% of the elderly are classified as having normal body weight. Meanwhile, 35% are overweight, 7% are obese, and 12% are underweight. Figure 4.4 further describes the BMI categories within genders.

The bar chart is in Figure 4.4. categorizes the BMI classification for female and male elderly living in old folk home in the Klang Valley area.

The percentage of elderly males reported as underweight (7.10%), normal (50%), overweight (32.10%), and obese (10.70%). Meanwhile, female elderly recorded 5.9% underweight, 41.20% normal weight, 41.20% overweight, and 11.80% are found to be obese.
Figure 4.4: Prevalence of malnutrition according to BMI categories and gender

Discussion

Malnutrition is a frequent issue existing within the elderly population. Saletti et al. (2000) addressed malnutrition among the elderly residing in institutional care facilities are common. Furthermore, the elderly are physiologically vulnerable to malnutrition due to social isolation and poverty associated with nutritional risk (Vishvanathan, 2005). Malnutrition can also be due to various physical and physiological changes in the body physically and physiologically as a part of aging, psychosocial and environmental factors, income and food accessibility, and others.

The prevalence of malnutrition among the elderly living at old folk home in the Klang Valley area was 11% of the total population (n=46). The percentage reduced slightly from a recent study by Abdul Aziz et al. (2019), which found that 13% of the elderly residing in old folk homes were malnourished. Meanwhile, another study by Mohd Shahrin et al. (2019) (n=57) found that the prevalence of malnutrition among the elderly in old folk homes was 12%.

On the other hand, the risk of malnutrition in elderly people living in old folk home in the Klang Valley area was 48%. Compared to previous research, there was an increase within a couple of years of research from Mohd Shahrin et al. (2019), which found the prevalence of elderly at risk of malnutrition at 40.4%. Viswanathan et al. (2005) reported that many elderly people in these shelter homes originated from rural communities and were poorly educated and at risk of undernutrition. Rural elderly Malaysians with no steady financial support and who were uneducated were at high risk of undernutrition (Shahar et al., 2001).

The elderly people at old folk home in the Klang Valley area were well-nourished (41%) analysed with Mini Nutritional Assessment. This is supported by a study from Visvanathan et al. (2005) that used Nutritional Health Checklist (NHC) and determined that 41.4% (n=287) of elderlies residing in publicly shelter homes in Peninsular Malaysia are well-nourished.

The energy and nutrient intake of elderly people living at old folk home in the Klang Valley area was manifested using a 24-hour food recall questionnaire (FFQ) retrieved from the Malaysian Adult Nutrition Survey 2003 by the Ministry of Health Malaysia. The 24-hour energy intake of the elderly residing in the old folk home in the Klang Valley area was significantly high. Elderly males consumed around 2453.9±421.6 kcal per day; meanwhile, elderly females consumed lesser at 2248.2±536.5 kcal. The mean dietary intakes for male and female respondents meet the energy and protein requirements. However, this did not agree with previous studies that reported that the mean energy and specific nutrient intake were significantly lower. Several factors affect food consumption among the elderly in the institution, which is found to be declined with age increment (Shahar et al., 2001). Other factors could be...
decreased sensory function, oral health problems and gastrointestinal complications, poor appetite, impaired ingestion, digestion, and absorption that will manifest in malnutrition (Volkert, 2013).

Aging is a process in which age-related change occurs in physiological systems, and that influences the physical function of the elderly in their activities of daily living (ADL) (Whittaken et al., 2018). Results showed that most of the respondents could perform activities of daily living, including feeding themselves, bathing, dressing, and grooming. It was found that 34.8% and 32.6% of male and female respondents were sedentary for more than 8.5 h daily. Sedentary physical activities were reported to be the highest among the male and female elderly residing in old folk homes, respectively. None of the subjects were found to be vigorously active in physical activity, as expected. Respondents said their lack of physical activity was due to joint pain and frailty. The amount of time spent being sedentary is an important risk factor associated with several aspects of ill health, including overweight and obesity and associated metabolic diseases [5]. Therefore, sedentary behaviour and physical activities are important factors to consider in the health of older adults.

Conclusion

In this present study, the energy and nutrient intake of elderly people at old folk home in the Klang Valley area was found to exceed the Recommended Nutrients Intake (RNI). The physical activity pattern among elderly people at old folk home in Klang Valley is found to be sedentary.

Malnutrition and risk of malnutrition are associated with increased mortality regardless of the origin of death, emphasizing the importance of early nutritional assessment to identify older adults who may require nutritional support to reduce the mortality rate of this age group (Soderstrom, 2017). Besides that, the early screening and diagnosis of malnutrition and the risk of malnutrition in old age helped the elderly understand their current health status. At this phase, elderlies are physiologically vulnerable to many health problems (Shahar et al., 2003).

This study also assessed the residents’ nutritional status in a negligence or abuse case of old folk homes. It has been found that there are several common signs of old folk homes negligence, which are malnutrition, dehydration, unusual weight loss, poor personal hygiene, and unsanitary living conditions (Kwok et al., 2001). Many studies have also agreed that many residents in old folk homes have inadequate calories, proteins, vitamins, and minerals (Kwok et al., 2001; Kergoat et al., 2000). Thus, the nutritional assessment is important to determine the relevance of old folk homes in providing adequate nutrition for their residents.

This study contains several limitations that can be improved, including time restrictions and a small sample size. The finding of this study is not suitable to be generalized for all old folk homes in Selangor or Malaysia due to its small sample size, in which only 46 respondents participated in this study.

For future studies in the range of similar topics, nutrition and energy intake of elderly people at old folk homes should be supervised by monitoring daily energy intake and energy spending to eradicate malnutrition which appears along with aging.

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