



## Original Article

# Quality Of Life among Elderly: The View from Appetite and Anthropometry Characteristic Perspective

Azam Syafinas<sup>1</sup>, Adznam Siti Nur 'Asyura<sup>1,2\*</sup>, Mun Chan Yoke<sup>1</sup>, Ibrahim Zuriati<sup>1</sup>, Taib Mohd Nasir Mohd<sup>1</sup>, Hamzah Nur Aqlili Riana<sup>1</sup>

<sup>1</sup> Department of Nutrition and Dietetics, Faculty of Medicine and Health Science, University Putra Malaysia, Selangor, Malaysia

<sup>2</sup> Malaysian Research Institute on Ageing (MyAgeing), University Putra Malaysia, Serdang, Malaysia

### ABSTRACT

#### Article history

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**Introduction:** The world's population ageing is poised to growth in number including in Malaysia. In conjunction with the transition of the nation toward ageing population, the Quality of Life (QoL) among elderly should be maintain or improved to good level. This study was to investigate the relationship between appetite, anthropometric characteristic and QoL among elderly people in the Federal Land Development Authority (FELDA) Schemes, Johor, Malaysia.

**Methods:** This cross-sectional study involved a total of 269 elderly (130 men and 139 women), with mean age of  $69.50 \pm 5.221$ . Elderly in FELDA Air Tawar 4, FELDA Air Tawar 5 and FELDA Bukit Batu were sampled using probability proportionate to size sampling. Data on age, monthly income and marital status were collected using questionnaire guided face-to-face Interviewed by trained researcher through house to house visit. Appetite was measured with Simplified Nutritional Appetite Questionnaire, height with stadiometer, weight with weighing scale, waist circumference with measuring tape and QoL with Short Form-36. The findings were analyzed using IBM SPSS statistics version 22 software.

**Results:** The majority of subjects were classified as good appetite, obese and large waist circumference. Role limitations due to emotional problems domain was highest mean score of QoL, while physical functioning domain the lowest mean score of QoL. Appetite ( $r = 0.260$ ;  $p < 0.001$ ), body mass index ( $r = -0.136$ ;  $p < 0.001$ ) and waist circumference ( $r = -0.191$ ;  $p = 0.002$ ) were correlated with physical component summary of QoL. However, they were not correlated with mental health component summary of QoL.

**Conclusion:** Most of the elderly are at good level of appetite, in obesity weight group, high risk of co-morbidities based on waist circumference measurement and at sensible level of QoL. Furthermore, as appetite, body mass index and waist circumference do have relation with physical component summary of QoL, thus, it is pivotal to include those factors as domain in planning health promotion program with aimed to increase QoL level among the elderly.

**Keywords:** Quality of Life, Appetite, Body Mass Index, Waist Circumference, Aged

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#### Introduction

The world's population ageing is poised to growth in number. According to data from World Population Prospects: the 2017 revision (1), the number of older persons with those aged 60 years or over is expected

to more than double by 2050 and to more than triple by 2100, rising from 962 million globally in 2017 to 2.1 billion in 2050 and 3.1 billion in 2100. In Malaysia, due to increase of life expectancy at birth,

\* **Corresponding Author:** Department of Nutrition and Dietetics, Faculty of Medicine and Health Science, University Putra Malaysia, Selangor, Malaysia. **Tel:** +60123612644, **Email address:** [asyura@upm.edu.my](mailto:asyura@upm.edu.my)

the number of elderly people has risen gradually (2). In conjunction with the transition of the nation toward ageing population, the Quality of Life (QoL) among elderly need to be investigated and should be maintained or improved to a good level. World Health Organization defines QoL as an 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, expectations, standards and concerns (3).

Study in urban Puducherry, India revealed that QoL among elderly is a neglected issue especially in developing countries (4). In developing countries, the demographic transition results in higher life expectancy and increase in the proportion of elderly population. The proportion of aged population are expected to be higher in the urban than rural area and the change in the demographic pattern of the aged population will also influence the distribution of health care resources (5). As there will be an improvement in the distribution of health care resources, the QoL of the elderly will become more stable including their health status. The health of the elderly is a pivotal factor that contributes towards their QoL and corresponds to the enhancement of the QoL (6). One of the most common health problems related among the elderly is poor appetite. Poor appetite can contribute to weight loss, nutritional deficiencies and associated with poor healthcare including mortality (7). Based on previous studies in Thailand, elderly who face appetite loss will affect their QoL (8). The study which reported the prevalence of appetite loss with 27.9% concluded that appetite lost affected not only QoL but also nutritional status.

Apart from that, as the ageing populations have increasing from time to time, so it is necessary to consider their nutritional status in order to make sure that they are in optimal health status. Therefore the elderly anthropometric characteristics must be quantified as it is an important indicator of an individual nutritional status (9). One of the best anthropometry characteristics is body mass index (BMI) as BMI formula has a strong correlation to body fat content that commonly can be used to assess the prevalence of overweight and obesity (10). BMI increases among middle-aged and elderly people, who are at greatest risk of health complications. Furthermore, anthropometric measurements are regarded as important indicators of an individual's nutritional status (11).

Other than that, in elderly population, BMI can be calculated by using weight and height, with height can be derived by equation prediction from arm-span (12). BMI do affect the level of QoL among elderly as underweight or obese can lead to impaired QoL compared to normal weight elderly (13). Furthermore, a cross-sectional study in Spain found concordance finding with the percentage of obese were 31.9% and 41.1% in men and women, respectively, the obese elderly showed worse in physical functioning (PF) domain of QoL compared with normal weight elderly (14). Other than BMI,

waist circumference was also known as one of the anthropometric characteristics. In depth, waist circumference and BMI were considered as useful measurement in predicting the health outcomes of elderly. In elderly, larger waist circumference results in high mortality risk. A study demonstrated that those elderly who had more than 102 cm waist circumference were related to increased mortality (15). In addition, a study on 1999 non-institutionalized elderly women illustrated diminished of QoL level as an impact from high value of waist circumference (16).

Even though various studies had been done regarding QoL, but the relation between appetite and anthropometric characteristics with QoL was ambiguity as very lack of study had been done in Federal Land Development Authority (FELDA) schemes in Malaysia. Moreover, due to an increase in ageing population in Malaysia, it is important to improve the QoL level among the elderly population. Therefore, the purpose of this study was to investigate the relationship between appetite, anthropometric characteristics and QoL among elderly people in the FELDA schemes, Johor, Malaysia.

## Methods

### *Procedure and sampling*

Cross sectional survey was conducted among elderly aged 60 years old in FELDA schemes, Johor Malaysia. Probability Proportionate to Size sampling was used for the selection of study location and subjects. Three FELDA schemes, FELDA Air Tawar 5, FELDA Air Tawar 4 and FELDA Bukit Batu, were selected from 71 FELDA schemes in Johor, Malaysia.

The sample size of this study was 273 elderly and was sampling according to the inclusion criteria of the study subjects. The inclusion criteria were elderly aged 60 years and above, both males and females, Malaysian, have been resident in the study locations for at least 6 months and no issues with mental illness or senile problem.

### *Measure*

The research instrument included four parts, which consisted of socio-demographic, appetite, anthropometric characteristics and QoL. The socio-demographic was designed as set of questions about the subjects regarding their gender, age, income and marital status.

Appetite: Appetite was measured by using Simplified Nutritional Appetite Questionnaire (SNAQ) (17). The SNAQ is composed of 4 items and each question presents 5 options for answer which are represented by letters from A to E. The questions are punctuated based on the following scale: A = 1, B = 2, C = 3, D = 4 and E = 5. When summed up, they give total score of the questionnaire which range from 4 and 20. Total score less or equal 14 indicates significant risk of at least 5% weight loss within six month. In

this study, the Cronbach's alpha value to test the reliability of SNAQ questionnaire was 0.60.

**Anthropometric measurement:** The parameters were waist circumference and BMI. Height was measured by using stadiometer model SECA 213. A stadiometer is a piece of medical equipment used for measuring human height. This method can only be used for subjects who can stand straightly without being assisted by other people. If the subjects have difficulty in stand straightly, other suitable method can be used to determine their height. Subjects stood with their scapula, buttocks and heels resting against a wall, the neck was held in a natural non-stretched position which means the toe will touched each other, the toe tips formed a 45 angle and the head was held straight with the inferior orbital border in the same horizontal plane which known as Frankfort's plane (18). However, measuring height can be difficult in physically and mentally frail subject, for example subject that are wheelchairs user or subjects with osteoporosis. Arm span is the most reliable body parameter for predicting the height of an individual especially predicting age-related loss in stature (19). In this study for those subjects that did not being able to stand straightly and need assisted by other people, their height were determined by using arm span calculation. Weight was measured by SECA 803 weight scale. Weighing scale should be put on flat hard surfaces that will allowed them to sit securely without rocking or tipping over (20). Body-weight must record in indoor clothing, without shoes, using a portable scale.

The waist circumference was used to determine whether the subjects have abdominal obesity or not. Waist circumference was measured by SECA 201 measuring tape. Subjects were asked to stand with feet close together, arms at the side and body weight evenly distributed. The measurements were taken at the end of a normal expiration and repeated twice, each. If the measurements were within 1 cm of one another, the average was calculated. If the difference between the two measurements exceeds 1 cm, the two measurements were repeated. Waist circumference should be measured at the midpoint between the lower margin of the least palpable rib and the top of the iliac crest, using a stretch resistant tape. The tape should be snug around the body, but not pulled so tight that it is constricting. Increased risk to metabolic diseases of elderly was compared with waist circumference cut-off points proposed by World Health Organization (21). Meanwhile, body weight status of elderly was determined based on their BMI status among Asian population (21). BMI is a simple measure to describe the relationships between height and weight and it is frequently recommended for screening and to monitor nutritional status (22).

**Quality of Life:** Short-Form 36 (SF-36) is a self-report health-related quality-of-life (HRQOL) questionnaire, was developed in 1992 (23). The questionnaire was used for measuring self-reported physical and mental health status. The SF-36 questionnaire consists of 36 items measuring

physical and mental health status in relation to eight health component. The eight components were PF, role limitations due to physical health (RPH), role limitations due to emotional problems (REP), energy or fatigue (EF), emotional wellbeing (EWB), social functioning (SF), pain (PN) and general health (GH) (24). A lower score of mean indicated a lower level of quality of life while higher scores reflected better functioning and greater wellbeing (25).

The 8 domains of QoL were contributed to the evaluation of two major aspects of component summary which were Physical Component Summary (PCS) and Mental Component Summary (MCS). PF, RPH, PN and GH domains were the clusters for PCS while REP, EF, EWB and SF domains were the clusters for MCS (26). In addition, PCS and MCS can be used to capture more than 80% of the reliable variance in the 8 domains of QoL (26). In this study, the Cronbach's alpha value to test the reliability of SF-36 questionnaire was calculated with relative validity coefficients ranged from 0.74 to 0.90 for PCS and ranged from 0.51 to 0.90 for MCS.

#### *Data Collection*

Data for this study was collected by house to house visit and each interview section was done rapidly and easily in about 20 minutes. A total of 269 subjects (130 men and 139 women) out of 273 participated in this study, with response rate of 98.5%. The reason of non-participation among the subjects were not willing to participate in this study and not available in their home during data collection even after three time visiting.

#### *Ethical Considerations*

The selected elderly were given information sheet and the approval from National Medical Research Registered (NMRR/14/1474/19811/IRR), Research Ethics Committee of Faculty Medicine and Health Sciences, Universiti Putra Malaysia (FPSK/FR14/007) and FELDA Head Quarters, Kuala Lumpur were obtained. The consent to be involved in this study was obtained from the elderly.

#### *Data analysis*

The data were analyzed using Statistical Package for Social Sciences (SPSS) version 22.0. The simple descriptive statistics were used to describe the general characteristics of the subjects. Pearson correlation and Spearman correlation analysis was employed depending on the normality of the data. Correlation analysis was to investigate the relationship between appetites, BMI and waist circumference with QoL. The statistical significance was set at a p-value < 0.05.

## **Results**

### *Socio-demographic characteristics*

Of the total subjects, 48.3% were men and 51.7% were women. Age of the subjects ranged from 60 to 87 years old, with a mean age of  $69.50 \pm 5.221$ .

Majority of them received more than MYR1200.00 income per month. Besides, most of the subjects were married (77.0%) followed by widowed (22.3%), single (0.4%) and divorced (0.4%).

*Appetite status*

Based on table 1, subjects were shows to be in a good level (71.4%) of appetite with mean score of SNAQ (15.54 ± 1.84). Furthermore, women (mean = 15.53 ± 27.37%) had significant lower mean of SNAQ score than men (mean = 15.56 ± 30.0%), indicating poorer appetite in women than men (p < 0.05).

*Body weight status*

Based on body weight status, table 1 shows that 53.2% of subjects were classified as obesity followed by 21.9% normal weight, overweight (17.1%) and underweight (7.8%). The mean value for BMI was 25.71 ± 5.16 and there is differences in mean of BMI between sexes with women (26.37 ± 5.34) significant higher mean of BMI compared to men (25.01 ± 4.89) (p < 0.05). Among the women subjects, 61.1% of them were classified as obese compared to 44.6% (p

< 0.05) of men subjects. Based on the waist circumference measurement, 61.3% of subjects were in high risk of co-morbidities with the mean value of 87.73 ± 13.90.

*Quality of life level*

In the scope of 8 QoL domain mean value, the REP (94.67 ± 10.58) domain scores proportionally the highest followed by EWB (89.93 ± 20.95), EF (89.70 ± 17.00), SF (89.45 ± 19.61), PN (86.94 ± 19.78), GH (76.10 ± 18.34), RPH (74.35 ± 34.78) and PF (70.91 ± 27.16) domain the lowest. When stratifying according to QoL component summary, MCS (62.31 ± 30.6) scores relatively higher than PCS (48.45 ± 8.88).

*Factors associated with QoL*

Table 2 revealed that appetite (r = 0.260; p < 0.001), BMI (r = -0.136; p < 0.001) and waist circumference (r = -0.191; p = 0.002) had negative relationship with PCS. However, appetite, BMI and waist circumference were not correlated with MCS of QoL.

**Table 1. Subject characteristics with their frequency, percentage, mean and standard deviation**

Variable	Groups	Full Sample, N=269	Men, n=130	Women, n=139
Age, Mean ±SD		69.50 ± 5.22	71.01 ± 4.88*	68.09 ± 5.15
Monthly Income (MYR), Mean ±SD		1673.99 ± 870.95	2063.11 ± 894.55*	1310.07 ± 670.12
Marital Status, n(%)	Single	1 (0.4)	0 (0.0)	1 (0.7)
	Married	207 (77.0)	123 (94.6)	84 (60.4)
	Divorced	1 (0.4)	1 (0.8)	0 (0.0)
	Widowed	60 (22.3)	6 (4.6)	54 (38.8)
Appetite, Mean ±SD n(%)	Good	15.54 ± 1.84 192 (71.4)	15.56 ± 1.88 91 (70.0)	15.53 ± 1.81 101 (72.7)
	Poor	77 (28.6)	39 (30.0)*	38 (27.3)
BMI, [kg/m2], Mean ±SD		25.71 ± 5.16	25.01 ± 4.89	26.37 ± 5.34*
Body weight status, n(%)	Underweight	21 (7.8)	12 (9.2)	9 (6.5)
	Normal	59 (21.9)	28 (21.5)	31 (22.3)
	Overweight	46 (17.1)	32 (24.6)	14 (10.1)
	Obese	143 (53.2)	58 (44.6)	85 (61.2)
Waist circumference [cm], Mean ±SD		87.73 ± 13.90	89.40 ± 11.88	86.18 ± 15.43
Risk to metabolic diseases, n(%)	No risk	104 (38.7)	65 (50.0)	39 (28.1)
	High risk	165 (61.3)	65 (50.0)	100 (71.9)
QOL domains, Mean ±SD	PF	70.91 ± 27.16	72.69 ± 28.89	69.24 ± 25.43
	RPH	74.35 ± 34.78	75.19 ± 32.57	73.56 ± 36.83
	REP	94.67 ± 10.58	93.33 ± 23.26	95.92 ± 17.70
	EF	89.70 ± 17.00	90.54 ± 16.48	88.92 ± 17.51
	EWB	89.93 ± 20.95	89.72 ± 21.07	90.13 ± 20.92
	SF	89.45 ± 19.61	89.90 ± 19.57	89.03 ± 19.71
	PN	86.94 ± 19.78	88.21 ± 18.08	85.76 ± 21.24
	GH	76.10 ± 18.34	74.62 ± 20.77	77.48 ± 15.69
QOL component summary, Mean ±SD	PCS	48.45 ± 8.88	48.89 ± 8.62	48.03 ± 9.13
	MCS	62.31 ± 30.68	60.19 ± 8.85	64.30 ± 41.79

\*Significant at level 0.05; MYR= Malaysia Ringgit

**Table 2. Relationships between appetite, BMI and waist circumference with QoL (PCS and MCS)**

Factors	PCS		MCS	
	r/r <sup>2</sup> value	P	r/r <sup>2</sup> value	P
<b>Appetite</b>	0.260**	0.000	0.035	0.568
<b>BMI, kg/m<sup>2</sup></b>	-0.136*	0.026	0.015	0.813
<b>Waist circumference, cm</b>	-0.191**	0.002	0.105	0.086

\*Significant at level 0.05; \*\*Significant at level 0.01

## Discussions

The results of our study illustrated appetite level in the subjects higher than other studies (27). For instance Suzana et al. reported that their elderly subjects who were residents in agricultural area had poor appetite (61.2%) compared to 71.4% in our study. The inconsistency in the findings between the studies is probably due to financial stability concerning in Suzana et al. most of their subjects did not working compared to our study subjects who obtained monthly income exceeds MYR 1200.00, way beyond the current poverty line of MYR 460.00 set by the Performance Management and Delivery Unit, Department of Prime Minister (28). Likewise, appetite level among low-incomes elderly was poor and at risk of malnutrition and supported the resolution of elderly who faced financial constraints were at high risk of developing poor appetite.

Nevertheless, in the view of body weight status study, a study in Singapore shows contradict findings with current study with majority of their subjects were normal (52.2%) follows by overweight (33.4%), obese (8.7%) and underweight (5.5%) (30). Divergent between the findings may due to inclusion and exclusion criteria. Fauziana et al. excluded those elderly who were bedridden (29) while our study that include those elderly that were bedridden or wheelchair bound.

Some studies have shown association between marital status and body weight (30). Elderlies who were married or divorced had higher risk of being overweight and obese compared to those who never married (30). In current study, most of the subjects were married which probably explain the pattern of high prevalence of overweight and obese. Other than that, sexually there was significant differences in body weight status in which women subjects were likely to be category as obese group compared to men. National Health and Morbidity Survey also stated the prevalence of obesity was significantly higher among women (31).

Based on the waist circumference measurement, 61.3% of the subjects were in at high risk of metabolic diseases with the mean value of waist circumference  $87.73 \pm 13.90$ . A study by Ho et al. revealed that a majority of their subjects were at high risk of metabolic diseases by reason of abdominal obesity in concordance with current study (32). Apart from that, aging had a direct relationship with waist circumference as elderly people have higher amount of visceral fat compared with younger adults (33).

This study reported that appetite has positive relationship with PCS of QoL. Loss of appetite was known to be one of the causes of malnutrition (34). The elderly with poor appetite will face malnutrition which may mediate decrease in QoL. Furthermore study among community elderly clock in information of malnutrition had association with QoL with significant reduction in QoL with an increasing risk of malnutrition (35). Kvamme et al. suggested that malnutrition may also be associated with diseases and conditions that decreased QoL (35). Besides, conditions of those with osteoporosis, lipid disorder and arthritis had lower QoL than those who did not (36). Food intake is not just physical act of eating food but also involves sociological and cultural aspects of eating that leads to life satisfaction and better QoL (37). In a nutshell, good appetite among current study subjects was one of the aspects that increases the life satisfaction and good level of QoL.

Moreover, this study revealed that BMI and waist circumference was associated with PCS. The finding were positively supported by study in Southern Brazil, which concluded that having excess weight by BMI  $\geq 25.0$  kg/m<sup>2</sup> and large waist circumference were associated with lower QoL level in elderly (38). In term of waist circumference, those elderly with higher waist circumference prompt to impair of mobility (39). By the same token, extreme abdominal obesity worsens the QoL of elderly (39). On top of that, the potent correlations between abdominal obesity and cardiovascular mortality risk (40) could influence the QoL level of the elderly.

## Conclusion

This study conclude that appetite, BMI and waist circumference do have relationship with PCS of QoL among elderly resident in FELDA, Johor. This study might provide essential information to implement public health policy for the policymakers. As BMI and waist circumference had relationships with QoL among the elderly residents at FELDA schemes, we recommend the policymakers to place a health educator in each FELDA schemes. The health educator can co-operate with researcher, non-government and relevant institutions to plan and implement health promotion programs among the elderly resident in FELDA schemes. The health promotion program can improvise the current aerobic

exercise program that already been held twice per month among the FELDA residents. Currently, the aerobic exercise program was conducted without supervision of professional trainers. Researchers would like to suggest for health educator to invite professional physical trainers to conduct the aerobic exercise program. A proper and right way of aerobic exercise is very important in order to avoid any mistakes during exercise. Simple mistakes can be costly as they can lead to injury, energy depletion and lack of motivation to progress.

### Study limitations

Ultimately, the cross-sectional nature becomes the limitation of this study as it measures the variables at only one point of time and could not investigate the causality of QoL.

### Conflict of interest

The author(s) declare(s) no potential conflicts of interests.

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### Authors' contribution

Syafinas A. and Siti Nur 'Asyura A. conceived of the presented idea. Syafinas A. and Nur Aqlili Riana H. collected data. Siti Nur 'Asyura A. supervised the research. Syafinas A. wrote the manuscript with support from Siti Nur 'Asyura A and Nur Aqlili Riana H.. Yoke Mun C., Mohd Nasir MT. and Zuriati I. provided critical feedback and helped shape the research. All authors discussed the results and commented on the manuscript.

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