Body image, nutritional status and quality of life in long-lived older adults

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Abstract

Objective: To evaluate the body image and nutritional status (NS) of older adults aged 80 and over and its relation with quality of life (QoL). *Method*: A cross-sectional, quantitative study, with no intervention, using non-probabilistic sampling, was conducted from October 2016 to September 2017 with 103 older individuals aged ≥80 years old from the state of São Paulo. NS was evaluated according to OPAS/SABE; body image was evaluated by the Kakeshita fifteen silhouette scale, and the WHOQoL-bref and WHOQoL-old were used to measure QoL. The Chi-square test was used to verify the association between the studied variables and sex. To compare QoL with nutritional status and body image, the ANOVA Factor test was used. The level of significance was 5% ($p<0.05$). *Results*: The majority of the interviewees were female (69.2%) and the average age was 82.75 (±2.98). When comparing the perception of QoL with NS, there was a significant difference ($p=0.027$) in the self-evaluation of QoL of obese older adults only. The QoL related to body image of both sexes presented a significant difference ($p=0.020$) in the environmental domain of the WHOQoL-bref in the evaluation of body satisfaction. *Conclusion*: The body image distortion identified by these older adults did not interfere with their perception of QoL. However, when NS was considered, overweight older adults had a higher perception of QoL.

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INTRODUCTION

Population aging is a worldwide phenomenon, and among older adults, those of greater age grow old at an accelerated rate. From the age of 80 onwards[1] such individuals are considered long-lived older adults[2]. Terms such as octogenarians, nonagenarians and centenarians can also be used for this population, based on the decade of life of the older adult[2]. For gerontology, the increase in life expectancy has brought a new challenge for the care of older adults aged over 80 years[3].

The increase in the number of older adults people is accompanied by a higher prevalence of Chronic Noncommunicable Diseases (CNCD)[4-6]. These are considered a natural part of the aging process and can aggravate or promote the appearance of other diseases[4]. The diseases that most affect older adults are cardiovascular illnesses, high blood pressure, stroke, diabetes and cancer[6].

Other changes resulting from aging include biopsychosocial changes such as sagging skin and muscles, weight gain, loss of hair shine and color, which can lead to dissatisfaction with body image. This is the mental representation of the body identity of human beings, and involves psychological, social, cultural and biological factors related to changes caused by the aging process[7].

Loss of muscle mass and overweight are changes in nutritional status that negatively affect the quality of life (QoL) of older adults[8]. These physical changes interfere with the representation of the body itself, and can cause a difference in the perception of the desired and real images in a way that impacts on the health and QoL of the individual[9].

Specific studies with older adults related to the perception of body image have been carried out in Brazil[1,7,10,11], however, most were not performed exclusively with older adults aged 80 or over. These studies have found a positive relationship between QoL and advancing age and physical activity[1] and a negative relationship with overweight[7] and non-normal nutritional status[10,11]. There has been a growing number of studies aimed at verifying how QoL impacts health promotion among older adults[1,12]. Thus, it is essential to carry out further studies that advance knowledge in this area in a manner that contributes to the generation of public policies that serve the fastest growing public in the world, namely, long-lived older adults. The objective of this study was to assess body image and nutritional status and their relationship with the quality of life of older adults aged 80 and over.

METHOD

This is a cross-sectional, quantitative, non-intervention study, performed with non-probabilistic sampling[13]. Data collection was carried out between Oct 2016 and Sep 2017, with 103 older adults aged 80 and over, of both sexes, living in different community contexts in the state of São Paulo. Among the participating municipalities are: São Paulo (n=39), São José dos Campos, (n=29), Jundiaí (n=18) and São Caetano do Sul (n=17).

Older adults were selected by a non-probabilistic convenience sample in five institutions which provide free activities in the areas of education, sports, leisure and culture, in addition to health promotion and care services for older adults.

All the participants met the inclusion criteria, being: of both sexes, aged 80 years or older; able to answer the questionnaires and carry out the proposed tests without the help of third parties. No exclusion criteria were defined, since older adults who participated in the study answered the invitation that was voluntarily delivered in each institution. Thus, when older adults were unwilling to participate in a test, they were considered absent in the database.

The data were collected by a team of researchers (physical educators, pharmacists, physiotherapists, nutritionists and psychologists) trained in the techniques of collection and evaluation. A questionnaire was used to obtain information on sociodemographic variables and the presence of diseases. Double entry validation was used when entering the data. Thus, all the survey questionnaires were typed and retyped. In case of disagreement, the researcher responsible for the instrument made the correction based on the respective questionnaire.

To measure body mass, a Plenna® brand portable digital scale with a maximum load of 150 kg and a precision of 0.1 kg was used. Height measurement was performed with a Welmy® portable stadiometer, with a scale of 0.5cm scale and a maximum height of 2m. Abdominal circumference (AC) and calf circumference (CC) were measured with an inelastic tape with a precision of 1mm.

Nutritional status was classified by the Body Mass Index (BMI) and analyzed according to the cutoff points recommended by the Pan American Health Organization (PAHO/SABE)[14], with older adults classified as underweight (<23.0 kg/m²), normal weight (23.0 - 28.0 kg/m²), overweight (28.0 - 30.0 kg/m²) and obese (>30.0 kg/m²).

Abdominal Circumference (AC) was classified as normal for men (<94 cm) and women (<80 cm); increased risk for men (94 - 102 cm) and women (80 - 88 cm); greatly increased risk for men (> 102 cm) and women (> 88 cm)[15]. For Calf Circumference (CC) three measurements were taken and the mean was used for classification, with CC$>$31cm[16] considered normal.

The Kakeshita fifteen silhouettes scale[17] was used to assess body image. This scale is composed of 15 cards for adults, in both a female and male version, with the shapes of both sexes shown according to variations in BMI. During the application of the test, the images were placed randomly on a table, and older adults chose the silhouette they considered the most similar to their current silhouette (CS) and what they believed to be the ideal silhouette (IS), while the real silhouette (RS) was established according to BMI result.

Body image was considered normal when RS=AS, overestimated when RS<AS and underestimated when RS>AS. In terms of body satisfaction, older adults were considered satisfied when AS=IS, dissatisfied due to thinness when AS<IS and dissatisfied due to excess weight when AS>IS.

For the subjective assessment of quality of life, the instruments developed by the Quality of Life Group, known as the World Health Organization Quality of Life (WHOQOL), as adapted for the Brazilian population by Fleck[18] and Fleck, Chachamovich, Trentini[19], were used in the abbreviated version (WHOQoL-Bref) and the specific for older adults version (WHOQoL-Old). A final score on both instruments close to 100 (maximum score) represents a high QoL, and a final score distant from 100, a low QoL.

The data were presented through descriptive statistics (mean and standard deviation), median, interquartile range, absolute and relative frequency. To identify the associations between the variables studied and sex, the Chi-square test and Fisher's exact test were used.

To compare QoL with nutritional status and body image, the Single Factor Anova Test was used, followed by the Tukey test. The level of significance was set at 5% ($p<0.05$) for all variables assessed.

The present study arose from the multicenter project entitled *Patterns of physical, cognitive and psychosocial aging in long-lived older adults living in different settings*, of the National Academic Cooperation Program (or PROCAD) proposed by the Universidade Estadual de Campinas (Campinas State University, or UNICAMP) in partnership with the Universidade Católica de Brasília (the Catholic University of Brasília, or UCB) and the Universidade de Passo Fundo (Passo Fundo University, or UPF). A partnership was signed between the three universities and the Universidade São Judas Tadeu (São Judas Tadeu University, or USJT), and each institution has the prerogative to propose objectives that meet the profile of the program in which the project is included. Thus, this project was approved under opinion nº 3327599.

Older adults signed an Informed Consent Form (ICF) created in accordance with the National Health Council (Resolution Nº466, dated 12 December 2012).

RESULTS

A total of 103 older adults people took part in the study, and the average age was 82.75 (±2.98). There was a minimum age of 80 years and a maximum age of 94 years. The majority of participants were female (69.2%), and most described themselves as

white (82.7%), widowed (58.7%), with a complete elementary school education (51.9%), living with others (66.3%), and earning between one and two minimum wages (51.9%).

When verifying morbidities, all older adults reported having at least one disease, the most frequent being Arterial Hypertension (82.2%), followed by Arthrosis (26.7%), Diabetes Mellitus (23.3%), Hypercholesterolemia (20.0%) and Arthritis (13.3%).

Table 1 shows that when nutritional status and body image were compared by sex, only the AC variable exhibited a significant association ($p<0.001$), with 81.7% of women presenting a much increased risk for cardiovascular diseases.

When comparing the perception of QoL (in its different domains and facets) with nutritional status, there was a significant difference ($p=0.027$) only in the self-assessment of QoL. Obese older adults had a significantly higher perception of QoL than overweight people (Table 2).

When considering sex, the perception of QoL in the autonomy facet is significantly ($p<0.001$) higher in women who are overweight than those who are obese or of normal wight. In the intimacy facet, the perception of QOL is significantly ($p=0.045$) higher in overweight older women than women of normal weight (Table 3). No significant difference was found in the domains and facets assessed for men.

QoL related to body image (perception and body satisfaction) evaluated for both sexes showed a significant difference ($p=0.020$) in the environment domain of the WHOQoL-Bref in the assessment of body satisfaction (Table 4). According to the Tukey test, the perception of QoL in the environment domain is significantly higher in older adults who are satisfied with their body than among those who are dissatisfied due to thinness.

When the domains and facets of QoL based on body perception were compared by sex, it was observed that men with overestimated and underestimated body perception had a significantly higher perception of QoL in relation to satisfaction with health ($p=0.006$), than men who saw themselves as normal. Older women with underestimated body perception have a significantly higher perception of QoL in the functioning of the senses ($p=0.042$) and autonomy ($p=0.039$) facets, compared to those who have an overestimated body perception (Table 5). When analyzing body satisfaction, no significant difference was found for either sex.

Table 1. Distribution of older adults (N=103), according to anthropometric measures and body image. São Paulo, 2016-2017.

Variables	Men	Women	Total	Chi-squared	p^*
	n (%)	n (%)	n (%)		
Nutritional status					
Low weight	05 (15.6)	10 (14.3)	15 (14.7)	0.899	0.826
Normal Weight	19 (59.4)	37 (52.9)	56 (54.9)		
Overweight	04 (12.5)	09 (12.9)	13 (12.7)		
Obesity	04 (12.5)	14 (20.0)	18 (17.6)		
Total	32 (100.0)	70 (100.0)	102 (100.0)		
Abdominal circumference					
Normal	14 (43.8)	2 (2.8)	16 (15.5)	37.542	<0.001
Increased risk	10 (31.3)	11 (15.5)	21 (20.4)		
Greatly increased risk	08 (25.0)	58 (81.7)	66 (64.1)		
Total	32 (100.0)	71 (100.0)	103 (100.0)		
Calf Circumference					
Not normal	02 (6.3)	06 (8.6)	08 (7.8)	0.164	0.686
Normal	30 (93.8)	64 (91.4)	94 (92.2)		
Total	32 (100.0)	70 (100.0)	102 (100.0)		
Body Perception				2.626	0.269
Normal	07 (22.6)	13 (18.6)	20 (19.8)		
Overestimated	12 (38.7)	39 (55.7)	51 (50.5)		
Underestimated	12 (38.7)	18 (25.7)	30 (29.7)		
Total	31 (100.0)	70 (100.0)	101 (100.0)		
Body Satisfaction				0.533	0.766
Normal	15 (48.4)	31 (44.3)	46 (45.5)		
Dissatisfied due to thinness	05 (16.1)	09 (12.9)	14 (13.9)		
Dissatisfied due to excess weight	11 (35.5)	30 (42.9)	41 (40.6)		
Total	31 (100.0)	70 (100.0)	101 (100.0)		

*level of significance ($p<0.05$).

Table 2. Distribution of older adults (N=103), according to nutritional status and quality of life. São Paulo, 2016-2017.

Quality of Life	Underweight (n=13) Mean QoL ± sd	Normal Weight (n=52) Mean QoL ± sd	Overweight (n=12) Mean QoL ± sd	Obesity (n=16) Mean QoL ± sd	F	p	η2 partial
WHOQoL-Bref							
Physical	67.30 ± 16.55	70.19 ± 15.48	69.35 ± 14.48	69.42 ± 16.65	0.12	0.949	0.4
Psychological	73.40 ± 14.08	72.76 ± 10.35	65.97 ± 13.74	74.45 ± 12.35	1.42	0.244	4.6
Social relationships	69.23 ± 20.52	69.39 ± 14.27	70.14 ± 13.97	78.13 ± 13.90	1.44	0.236	4.6
Environment	71.40 ± 15.35	70.19 ± 12.70	68.75 ± 13.06	72.27 ± 12.28	0.20	0.897	0.7
Self-assessment of quality of life	75.00 ± 14.43[ab]	78.84 ± 15.95[ab]	72.92 ± 16.71[a]	89.06 ± 12.81[b]	3.20	0.027	9.7
Self-assessment of health satisfaction	75.00 ± 17.68	72.59 ± 25.85	70.83 ± 14.43	89.06 ± 12.81	0.07	0.976	0.2

Quality of Life	Underweight (n=12) Mean QoL ± sd	Normal Weight (n=50) Mean QoL ± sd	Overweight (n=12) Mean QoL ± sd	Obesity (n=13) Mean QoL ± sd	F	p	η2 partial
WHOQoL-old							
Functioning of senses	71.35 ± 21.73	70.63 ± 22.53	79.17 ± 19.46	79.81 ± 22.12	0.94	0.424	3.3
Autonomy	70.83 ± 17.94	63.38 ± 16.89	76.04 ± 18.43	62.98 ± 17.76	2.16	0.099	7.2
Past, present and future activities	78.13 ± 13.98	73.13 ± 17.78	76.56 ± 18.49	77.40 ± 12.64	0.47	0.703	1.7
Social participation	76.04 ± 16.82	70.63 ± 15.68	78.65 ± 18.36	76.44 ± 11.74	1.24	0.301	4.3
Death and dying	76.56 ± 21.00	68.12 ± 27.53	63.54 ± 26.36	66.35 ± 28.24	0.53	0.661	1.9
Intimacy	76.56 ± 17.09	72.00 ± 18.39	76.56 ± 25.86	79.33 ± 16.41	0.65	0.584	2.3

[ab]In the self-assessment of quality of life compared to nutritional status, means followed by the same letter[ab] do not differ among one another and means followed by different letters[ab] differed among one another according to the Tukey test; QoL: quality of life; sd: standard deviation; F: force; p: level of significance (p<0.05); η2 partial: η partially squared.

Table 3. Distribution of older women (n=61) according to nutritional status and quality of life, classified by sex. São Paulo, 2016-2017.

Sex	Quality of Life	Underweight (n=8) Mean QoL ± sd	Normal Weight (n=33) Mean QoL ± sd	Overweight (n=8) Mean QoL ± sd	Obese (n=12) Mean QoL ± sd	F	p	η2 partial
Women	**WHOQoL-Bref**							
	Physical	71.42 ± 17.70	71.64± 15.46	71.42 ± 16.31	69.94 ± 18.50	0.03	0.992	0.2
	Psychological	76.56 ± 12.28	73.59 ± 9.42	65.10 ± 14.93	73.95 ± 14.00	1.55	0.213	7.5
	Social relationships	81.25 ± 16.51	71.46 ± 13.50	70.83 ± 14.88	80.55 ± 14.46	2.00	0.124	9.5
	Environment	75.49 ± 14.41	73.10 ± 11.31	69.53 ± 14.44	72.65 ± 14.23	0.29	0.831	1.5
	Self-assessment of quality of life	78.12 ± 16.02	75.00 ± 18.90	75.00 ± 18.99	89.68 ± 12.98	2.12	0.108	10.0
	Self-assessment of health satisfaction	75.00 ± 18.90	71.21 ± 25.10	68.75 ± 11.57	66.77 ± 28.97	0.22	0.882	1.1
	WHOQoL-old							
	Functioning of senses	78.57 ± 14.81	68.03 ± 21.90	87.50 ± 12.04	77.09 ± 24.80	2.26	0.092	11.0
	Autonomy	73.21 ± 16.42[ab]	65.18 ± 15.91[b]	85.15 ± 12.01[a]	55.66 ± 14.13[b]	5.99	<0.001	24.6
	Past, present and future activities	82.14 ± 11.09	72.85 ± 18.97	82.81 ± 17.91	78.47 ± 12.92	1.16	0.335	5.9
	Social participation	73.21 ± 21.97	69.64 ± 16.05	86.71 ± 14.34	74.30 ± 11.02	2.50	0.069	12.0
	Death and dying	79.56 ± 12.35	69.38 ± 26.13	64.84 ± 27.73	58.33 ± 24.40	1.01	0.394	5.2
	Intimacy	81.25 ± 11.97[ab]	73.92 ± 16.00[b]	90.62 ± 13.88[a]	81.94 ± 16.95[ab]	2.87	0.045	13.5

[ab] In the self-assessment of quality of life compared to nutritional status, means followed by the same letter[ab] do not differ among one another and means followed by different letters[ab] differ among one another according to the Tukey test; QoL: quality of life; sd: standard deviation; F: force; p: level of significance (p<0.05); η2 partial: n partially squared.

Table 4. Distribution of older adults (N = 103), according to body image and quality of life. São Paulo, 2016-2017.

Quality of Life	Body Image			F	p	η2 partial
	Normal (n=16) Mean QoL ± sd	Overestimated (n=48) Mean QoL ± sd	Underestimated (n=28) Mean QoL ± sd			
WHOQoL-bref						
Physical	71.20 ± 15.57	68.75 ± 16.28	70.41 ± 14.45	0.19	0.826	0.4
Psychological	70.83 ± 13.86	72.74 ±12.15	71.58 ± 11.17	0.18	0.837	0.4
Social relationships	70.31 ± 17.47	73.44 ± 14.04	68.16 ± 15.22	1.13	0.326	2.5
Environment	69.93 ± 15.89	71.29 ± 12.98	69.53 ± 11.46	0.18	0.836	0.4
Self-Assessment of Quality of Life	75.00 ± 18.26	80.73 ± 16.50	79.46 ± 13.70	0.77	0.467	1.7
Self-assessment of health satisfaction	68.75 ± 28.14	70.83 ± 25.44	76.79 ± 19.16	0.74	0.480	1.6

Quality of Life	Body Image			F	p	η2 partial
	Normal (n=18) Mean QoL ± sd	Overestimated (n=45) Mean QoL ± sd	Underestimated (n=23) Mean QoL ± sd			
WHOQoL-old						
Functioning of senses	72.22 ± 23.70	70.56 ± 22.24	79.62 ± 20.83	1.30	0.279	3.0
Autonomy	65.28 ± 19.79	64.17 ± 17.14	69.02 ± 19.35	0.54	0.584	1.3
Past, present and future activities	71.88 ± 14.74	72.50 ± 18.09	81.25 ± 13.98	2.50	0.088	5.7
Social participation	73.61 ± 11.25	70.97 ± 16.22	76.36 ± 18.75	0.87	0.422	2.1
Death and dying	75.57 ± 22.50	68.75 ± 26.48	63.32 ± 29.21	0.66	0.527	1.5
Intimacy	69.79 ± 16.50	76.67 ± 15.27	73.10 ± 25.87	0.91	0.406	2.2

to be continued

Continuation of Table 4

Quality of Life	Body satisfaction			F	p	η2 partial
	Satisfied	Dissatisfied due to Thinness	Dissatisfied due to Excess Weight			
	(n=42) Mean QoL ± sd	(n=13) Mean QoL ± sd	(n=37) Mean QoL ± sd			
WHOQoL-Bref						
Physical	71.47 ± 16.24	61.26 ± 16.74	70.66 ± 13.50	2.33	0.103	5.0
Psychological	74.31 ± 12.17	66.67 ± 13.07	71.40 ± 11.20	2.13	0.124	4.6
Social relationships	73.61 ± 14.94	69.23 ± 17.14	69.37 ± 14.44	0.92	0.402	2.0
Environment	74.11 ± 13.63[a]	63.46 ± 13.98[b]	68.92 ± 10.60[ab]	4.07	0.020	8.4
Self-assessment of quality of life	82.74 ± 15.11	75.00 ± 17.68	77.03 ± 16.01	1.84	0.163	4.0
Self-assessment of health satisfaction	72.62 ± 23.95	67.31 ± 25.79	73.65 ± 24.26	0.33	0.717	0.8

Quality of Life	Body satisfaction			F	p	η2 partial
	Satisfied	Dissatisfied due to Thinness	Dissatisfied due to Excess Weight			
	(n=40) Mean QoL ± sd	(n=12) Mean QoL ± sd	(n=34) Mean QoL ± sd			
WHOQoL-old						
Functioning of senses	73.59 ± 22.71	71.35 ± 23.30	73.71 ± 22.02	0.05	0.948	0.1
Autonomy	65.78 ± 19.46	71.86 ± 16.96	63.42 ± 17.07	0.96	0.389	2.3
Past, present and future activities	76.86 ± 15.26	78.13 ± 13.19	70.96 ± 19.02	1.46	0.238	3.4
Social participation	73.59 ± 16.17	76.04 ± 17.24	71.14 ±15.77	0.47	0.630	1.1
Death and dying	69.84 ± 27.07	78.65 ± 23.90	62.32 ± 25.63	1.90	0.156	4.4
Intimacy	77.19 ± 17.48	69.30 ± 20.78	69.30 ± 20.78	2.03	0.138	4.7

[ab]In the self-assessment of quality of life compared to body satisfaction, means followed by the same letter[ab] do not differ among one another and means followed by different letters[ab] differ among one another according to the Tukey test; QoL: quality of life; sd: standard deviation; F: force; p: level of significance (p<0.05); η2 partial: n partially squared.

Table 5. Distribution of older adults (N=103), according to body image and quality of life, classified by sex. São Paulo, 2016-2017.

Sex	Quality of Life	Body image			F	p	η2 partial
		Normal (n=16) Mean QoL ± sd	Overestimated (n=12) Mean QoL ± sd	Underestimated (n=12) Mean QoL ± sd			
	WHOQoL-Bref						
	Physical	65.81 ± 15.13	64.58 ± 13.40	68.75 ± 15.54	0.25	0.779	1.8
	Psychological	63.69 ± 10.95	72.92 ± 11.02	73.96 ± 13.19	1.84	0.178	11.6
	Social relationships	64.28 ± 17.16	64.58 ± 10.13	65.97 ± 16.84	0.04	0.961	0.3
	Environment	61.61 ± 16.11	67.45 ± 10.53	67.71 ± 13.41	0.57	0.572	3.9
	Self-assessment of quality of life	67.86 ± 18.90	79.17 ± 20.87	79.17 ± 14.43	1.05	0.363	7.0
	Self-assessment of health satisfaction	53.57 ± 30.37[a]	83.33 ± 16.28[b]	85.41 ± 16.71[b]	6.28	0.006	40.0
		Body image			F	p	η2 partial
	Quality of Life	Normal (n=07) Mean QoL ± sd	Overestimated (n=10) Mean QoL ± sd	Underestimated (n=10) Mean QoL ± sd			
Men	**WHOQoL-old**						
	Functioning of senses	66.96 ± 28.56	80.63 ± 16.52	72.50 ± 26.39	0.71	0.501	5.6
	Autonomy	54.46 ± 21.56	71.88 ± 16.20	61.25 ± 18.82	1.90	0.171	13.7
	Past, present and future activities	67.85 ± 17.09	70.00 ± 14.37	78.75 ± 13.57	1.37	0.272	10.3
	Social participation	72.32 ± 11.33	73.13 ± 11.04	75.00 ± 19.76	0.07	0.929	0.6
	Death and dying	82.14 ± 26.13	70.63 ± 29.02	59.38 ± 33.24	1.20	0.319	9.1
	Intimacy	65.18 ± 26.13	74.38 ± 14.86	60.00 ± 28.75	1.08	0.355	8.3

to be continued

Continuation of Table 5

Sex	Quality of Life	Body image			F	p	η2 partial
		Normal (n=09) Mean QoL ± sd)	Overestimated (n=36) Mean QoL ± sd	Underestimated (n=16) Mean QoL ± sd)			
	WHOQoL-Bref						
	Physical	76.39 ± 13.82	70.14 ± 17.08	71.65 ± 13.95	0.39	0.679	1.3
	Psychological	76.39 ± 12.66	72.69 ± 12.66	69.79 ± 9.44	0.87	0.424	2.9
	Social relationships	75.00 ± 17.18	76.39 ± 14.02	69.79 ± 14.23	1.15	0.325	3.8
	Environment	76.39 ± 13.01	72.57 ± 13.57	70.90 ± 9.99	0.56	0.583	1.8
	Self-assessment of quality of life	80.56 ± 16.67	81.25 ± 15.09	79.69 ± 13.60	0.06	0.941	0.2
	Self-assessment of health satisfaction	80.56 ± 20.83	66.67 ± 26.73	70.31 ± 18.75	1.20	0.308	4.0
	Quality of Life	Body image			F	p	η2 partial
		Normal (n=11) Mean QoL ± sd)	Overestimated (n=35) Mean QoL ± sd	Underestimated (n=13) Mean QoL ± sd			
Women	**WHOQoL-old**						
	Functioning of senses	75.57 ± 20.81[ab]	67.68 ± 23.01[a]	85.10 ± 14.10[b]	3.36	0.042	10.7
	Autonomy	72.16 ± 15.90[ab]	61.96 ± 16.97[a]	75.00 ± 18.22[b]	3.45	0.039	11.0
	Past, present and future activities	74.43 ± 13.24	73.21 ± 19.15	83.17 ± 14.52	1.60	0.210	5.4
	Social participation	74.43 ± 11.68	70.36 ± 17.50	77.40 ± 18.67	0.90	0.413	3.1
	Death and dying	66.48 ± 18.59	68.21 ± 26.14	66.35 ± 26.70	0.04	0.964	0.1
	Intimacy	72.73 ± 14.60	77.32 ± 15.54	83.17 ± 18.82	1.28	0.286	4.4

[a,b]In the environment domain compared to body satisfaction, means followed by the same letter[ab] do not differ among one another and means followed by different letters[ab] differ among one another according to the Tukey test; QoL: quality of life; sd: standard deviation; F: force; p: level of significance (p<0.05); η2 partial: n partially squared.

DISCUSSION

The present study discusses relevant themes related to the nutritional status, body image and Quality of Life of older adults aged 80 and over. Regarding perception of QoL and nutritional status, obese older adults had a better self-assessment of QoL. This is related to body satisfaction and perception, which was higher in the environment domain and in the assessment of body satisfaction (WHOQoL-Bref) of older adults of both sexes who were satisfied with their body.

In self-reported diseases, there was a predominance of arterial hypertension followed by osteoarthritis. In the longitudinal study entitled *EpiFloripa* carried out with older adults people from the urban area of Florianópolis (Santa Catarina), diseases were also investigated in a self-reported manner. At the study baseline (2009/2010) 58.1% of older adults reported being hypertensive, while following the study in 2013/2014 the percentage of hypertensive patients increased to 65.1%, although the data did not identify a statistically significant difference (p=0.059)[20]. Araújo et al.[21] found that the high incidence of chronic diseases, associated with the increase in chronological age and decreased functional capacity, can contribute to the reduction of the ability of older adults people to perform activities independently.

In assessing nutritional status, the older adults studied were mostly of normal Weight, a similar result to that observed in the study by Sass and Marcon[22] in which 37.5% of older adults were of normal weight, followed by 31.7% who were obese. In the group aged 80 and over, the older adults had normal weight, with a mean BMI of 25.13±3.50 among men and 26.02±5.40 among women.

A survey carried out in Brazil with a population-based sample presented data similar to those found in this study, with 43.8% of long-lived older Brazilians (80 years or older) being of normal weight, however, the authors highlight that this age group presented the highest percentage (26.3%) of underweight older adults, according to the classification proposed by the Food and Nutrition Surveillance System (SISVAN), 2011[23].

In a study carried out with older adults aged over 80, attending a physical activity program at the Universidade de São Francisco in the city of Petrolina (Pernambuco), the mean BMI was 24.98±0.79. The authors assessed BMI by two criteria, WHO (2000) and NSI (1994). According to both, the mean BMI value classified the older women as of normal weight. When BMI was assessed separately, there was a difference in the assessment according to the WHO, with 66.7% of older women being underweight and 33.3% normal weight[8].

Most of the cutoff points for BMI available in scientific literature are for North Americans and Europeans. The World Health Organization criteria are widely used in Brazilian and international studies, even though it has been established for the diagnosis of BMI in adults. The classification proposed by the NSI considers body changes in older adults, and is recommended for the use of studies with this public. The Pan American Organization also presents cutoff points for older adults, however, which consider the characteristics of the Latin American population[20].

Thus, given the different criteria for the classification of BMI, it is important to choose the cut-off point that is closest to the characteristics of the population to be studied, so that the results obtained are more reliable. It is emphasized that they should be used with caution, as when applied in isolation they do not represent a parameter for assessing body composition.

Abdominal visceral fat assessed by AC identified a significantly increased risk for cardiovascular diseases in the older adults studied. A similar result was found by Nascimento et al.[8], with octogenarian older adults having a mean value of 89.0 ± 9.84, with a risk for metabolic complications; while in the study by Fan et al.[24] the mean AC values were 88.83 cm in men and 87.96 cm in women. According to the Asian Health Standard, only women had abdominal obesity, with AC above 85 cm. The assessment of adiposity should be more effective, as underweight, obesity, arterial hypertension, type 2 diabetes and abdominal obesity increase the risk of morbidity and mortality[8,24]. AC reflects visceral fat and has been shown to be strongly associated with cardiovascular disease and mortality, in comparison with BMI[24,25].

Older adults who were satisfied with their bodies exhibited a positive perception of QoL in the environment domain, which suggests that older adults are satisfied with their bodies and are concerned with health-related care, financial resources, information, home environment, physical environment, transportation, recreation and security physical.

Older adults with an overestimated or underestimated body image have a higher perception of QoL through self-rated health satisfaction. Older women with underestimated body image present a positive QoL in the facets of sensory functioning and autonomy. This finding suggests that for these older women, having a lower body image favors improved performance in activities that involve sensory skills, in addition to greater independence in making their own decisions. Having awareness of one's own body can positively reflect on the inherent acceptances of the aging process[7] and contribute to decision making. Independence (self-care) and autonomy (acting and making decisions) are perceived by older adults as important components of healthy aging[26].

It was observed that older adults with body image distortion, whether under or overestimated, had a more positive perception of QoL in relation to those with normal body image, which suggests that their QoL does not depend on their body image, unlike what has been found in literature. For Martins et al.[11] this fact may be related to the different cultures and regional historical experiences of the individual, which conflict with dissatisfaction of body image. Menezes et al[7] argue that a satisfactory perception of body image can be influenced by aspects such as acceptance/adaptation with age, satisfactory living conditions, favorable financial conditions, good relationships with children, social contact, and acceptance of changes in the aging process, among other factors that can intervene positively in the health status of individuals.

There are few studies in literature that assess body image in long-lived older adults. This may be due to the concern with body image being more present in younger older adults, who are still very much aware of the search for the perfect, rejuvenated body, which does not bear the marks of the aging process[24]. For Menezes et al.[7], this non-acceptance of aging is worrying, as it can trigger compensatory attitudes that put the health of older adults at risk.

A study with older adults from Campina Grande (Paraiba), found that 67.7% of a group aged 80 years or older (n=164) had a satisfactory perception of body image according to the Stunkard et al. scale, while 41.1% of older adults and 15.8% of older adults had a greater prevalence of dissatisfaction with their perception of body image. However, the authors observed that octogenarian older adults were more satisfied with their body image than younger older adults. These data can be explained by the fact that long-lived individuals are more concerned with the health and functionality of the body than with aesthetics[7].

Body image research has focused on younger women because older women were presumed to be immune to body dissatisfaction. However, studies presented in the review by Cameron et al., indicate that older women experience different levels of body dissatisfaction. Concerns about the body among older women involves dissatisfaction with gray hair, wrinkles, loss of muscle tone and weight gain[27].

Obese older adults presented a positive self-assessment of QoL. Only in underweight older women was a significant difference found in the perception of QoL in the facets of autonomy and intimacy, which was higher when compared with other classifications of nutritional status. It is inferred that these older women do not abstain from a social life because of their weight, much less let this interfere with their decision making. During the data collection process, it was observed that for older women, there is a belief that being overweight is understood as healthy, since thinness is associated with diseases.

A different result from this study was found by Miranda, Soares and Silva[1], with 55.9% of overweight older adults considering their QoL and satisfaction with health to be poor. However, when age group was considered (70-79 years and ≥80 years), advanced ages were associated with better perception of QoL. This result reaffirms the findings in the literature that older adults accept old age more than younger older adults, who still deny the aging process.

Among the limitations of this study, it should be noted that the convenience sampling technique included older adults interested in participating in the study and who, therefore, were active in their community in some way, and did not include frail older adults. Furthermore, the lack of specific Brazilian and international literature with older adults aged over 80 made comparative analysis difficult. Additionally, as this is a cross-sectional study, it was not possible to establish a cause and effect relationship between the factors associated with the QoL of older adults.

CONCLUSION

The exponential growth of long-lived older adults currently occurring in Brazil and around the world challenges different segments of society to produce knowledge that results in the understanding of factors that directly affect the Quality of Life (QoL) of this age group. Thus, the identification of these factors is essential to promote interventions aimed at meeting the needs of this population.

The present study showed that the distortion of the body image of older adults did not interfere in their perception of QoL. On the other hand, when assessing nutritional status, overweight older adults had a better perception of QoL, which suggests that older adults aged 80 and over are better adapted to the changes that occur in the body in the aging process.

It is important to carry out longitudinal studies in order to identify factors that directly affect QoL throughout the aging process, thus providing conditions for the adoption of preventive and health promotion measures.

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