

## Eating Habits and Diseases Associated with the Aging Process

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### Abstract

This study illustrates the impact of dietary habits on the development of chronic non-communicable diseases (NCDs) and analyzes how changes in lifestyle open possibilities for improvement in the quality of life and how they contribute to the so-much desired successful aging. This is a cross-sectional quantitative study of a population aged 60 years and older, of both genders, living in the city of São Luís, Maranhão (MA). A semi-structured questionnaire was used to investigate the socio-demographic profile, weekly food consumption and lifestyle analysis. A total of thirty-four elderly individuals were evaluated; they were predominantly female (79.41%), non-whites (52.94%), and married (61.76%). Among the elderly, 55.88% (n=19) had at least one chronic NCD, the most frequent of which was arterial hypertension (51.61%) followed by obesity (29.03%) and diabetes mellitus (19.35%). The study showed a significant daily consumption of rice (47.1%), milk (61.8%), coffee (58.8%), and bananas (79.4%). The consumption of fish (64.7%) and leafy vegetables (38.2%) was shown to be consumed twice a week.

**Keywords:** Aging, nutrition, chronic diseases, lifestyle, quality of life, longevity.

### Introduction

Aging represents a challenge nowadays, as the elderly are the fastest growing portion of the population. The World Health Organization (WHO) predicts that there will be 1.2 billion people over the age of 60 by 2025, with very old people (aged 80 and over) being the fastest growing age group. Thus, it is estimated that, by 2025, the growth of this population segment will place Brazil in sixth position in the ranking of countries with the highest rates of human aging (Bina & Abreu, 2016; Bernardi *et al.*, 2017; Cruz *et al.*, 2017).

This significant growth in the number of elderly people is due to increased longevity and improved health conditions and quality of life. However, the inversion of the population pyramid does not always have a positive indication; after all, living longer is not synonymous with living better as quoted in the literature (Bina & Abreu, 2016; Nogueira *et al.*, 2016).

At an individual basis, longer life expectancy results in a complex situation, which is the fear of reaching this stage with limitations and dependencies (Monteiro & Maia, 2015). Maintaining health status is one of the major concerns of this population group. In this scenario, an important goal is to prevent pathologies and ailments, and to remain capable of carrying out one's daily activities without depending on others (Nogueira *et al.*, 2016).

Changes in the epidemiological and demographic profiles of the Brazilian population have resulted in changes in nutritional patterns, which have a direct effect on lifestyle and overall health (Cruz *et al.*, 2017; Oliveira *et al.*, 2016). Moreover, health, nutrition and aging are closely intertwined, and so maintaining the health of the elderly is considerably dependent on an adequate nutritional status and a balanced diet (Rezende *et al.*, 2016).

Reis *et al.* (2015) analyzed aging as a natural process in the population in general and correlated it with the onset of diseases, causing a slow and gradual impact on all individuals, causing biological and socio-environmental changes.

The aging process can trigger or exacerbate numerous health-related problems that can impact both the quality of life and life expectancy. The main systemic comorbidities, considered chronic and associated with a set of physio-metabolic alterations, are systemic arterial hypertension, diabetes mellitus, obesity, dyslipidemia and metabolic syndrome (Freitas *et al.*, 2015; Martins *et al.* 2015).

Chronic diseases are a major health problem, causing 68% of deaths worldwide. Of these deaths, 40% are considered premature, occurring before 70 years of age. Chronic non-communicable diseases (NCDs) are responsible for 80% of primary care consultations and 60% of hospital admissions. They are currently the major cause of disability (Silocchi & Junges, 2017).

The assessment of the physical, psychological, social and cultural conditions of the elderly allows for the understanding of their health needs. The generated information can support the implementation of programs and planning of care strategies and interventions appropriate to the reality of this group of people (Cruz *et al.*, 2017: 430). According to Bina and Abreu (2016), body weight control and a balanced diet are essential to achieve the necessary health care conditions.

An individual's eating habits can be determined by a number of factors, ranging from family habits, taboos, religious beliefs, and socio-cultural and financial conditions. The diet has to be adequate in

order to ensure good nutritional status, maintain vital functions, and meet specific physiological conditions, namely, growth, pregnancy, lactation, maintenance and recovery, (Bernardi *et al.*, 2017; Henriques *et al.*, 2015; Monteiro & Maia, 2015; Nogueira *et al.*, 2016; Oliveira *et al.*, 2016).

As society develops, the number of older people increases, and health problems challenge existing health care models. Technological advances and the health sciences offer the opportunity to enjoy a better quality of life at an advanced age. Lifelong preventive strategies have become more important in solving today's and, especially, future challenges (Oliveira *et al.*, 2016).

Therefore, the construction of healthy eating habits is fundamental for maintaining the quality of life during all stages of life, and is not different throughout the senescence process.

## **Purpose and Scope**

This study aims to show the impact of certain eating habits on the development of chronic NCDs among elderly patients who attended a Specialized Center for Rehabilitation of Elderly People in São Luís-MA, and shows how nutrition education and lifestyle changes open up possibilities for improvement in the quality of life and, mainly, contribute to the so-much desired successful aging.

## **Methodology**

This is a cross-sectional and observational study, whose data were collected at a single moment, presenting descriptive and analytical characteristics. The sample was non-probabilistic for convenience, consisting of 34 elderly patients aged 60 years and over, of both genders, residing in the municipality of São Luís, Maranhão (MA), who attended the elderly group of the Specialized Center for Rehabilitation of Elderly People.

The elderly were invited to participate in the research and were informed about the objectives, limitations and benefits of this scientific work. Only individuals who, after reading and signing the informed consent form, spontaneously expressed acceptance participated in the study. Individuals who did not agree to participate or who were younger than 60 years were excluded. The informed consent form was prepared according to Resolution of the National Health Council nº 196/96, which standardizes research on human beings and explains the objectives of the project. Data was collected through specific questionnaires.

In the first stage of the study, a protocol form prepared by the researchers was filled out covering the socioeconomic and demographic data; the second stage consisted of a semi-open food frequency questionnaire (FFQ) developed by Fisberg *et al.* (2008). The FFQ was based on dietary information obtained through a 24-hour recall (R24h) of 1,477 adults (708 men and 769 women), aged between 20 and 101 years, with a mean age of 37 ( $\pm$  18) and 35 ( $\pm$  18) years, from different socioeconomic strata in the city of São Paulo.

To survey the socio-demographic profile and analyze the lifestyle, a semi-structured questionnaire with multiple questions was used which covered age, gender, education, occupation, family disease history: diseases reported by the elderly and existing in first-degree relatives (father and mother); clinical status and medication use: symptoms of any disease and types of medications consumed; lifestyle habits: tobacco use, alcohol consumption, eating habits, and diet practice.

The nutritional status was assessed by the Body Mass Index (BMI), calculated with the weight and height to be measured in the participants. The recommendations used by Lipschitz (1994) were adopted as a classification criterion, considering the following cutoff points: low weight - BMI < 22 kg/m<sup>2</sup>; eutrophic - BMI between 22 kg/m<sup>2</sup> and 27 kg/m<sup>2</sup>; and overweight - BMI > 27 kg/m<sup>2</sup>. A Filizola® digital anthropometric scale with ruler, with 150 Kg capacity and accurate to 100gm, was used to measure weight. Weight was measured in individuals wearing light clothes and who were barefoot. Height was measured using a vertical anthropometry attached to the scale, barefoot, with the feet close together, arms extended along the body and eyes fixed at the height of the horizon line.

Data was tabulated, and statistical analyses were carried out using the Microsoft Office Excel® software. The analyses were presented in tables and graphs.

Quantitative variables were described as means and standard deviations, and categorical variables were described as absolute and relative frequencies. The Pearson's chi-square test was used to compare proportions. The level of statistical significance adopted was 5% ( $p \leq 0.05$ ).

The research project was approved by the Research Ethics Committee (REC) of the University Center of Maranhão - UNICEUMA under Opinion n° 3.104.563 and CAAE n° 00985718.2.0000.5084.

## Findings

Thirty-four elderly people were evaluated. They were predominantly female (79.41%), non-white (52.94%), married (61.76%), from the capital city (41.18%), and lived with up to three people at home (32.35%) (Table 1).

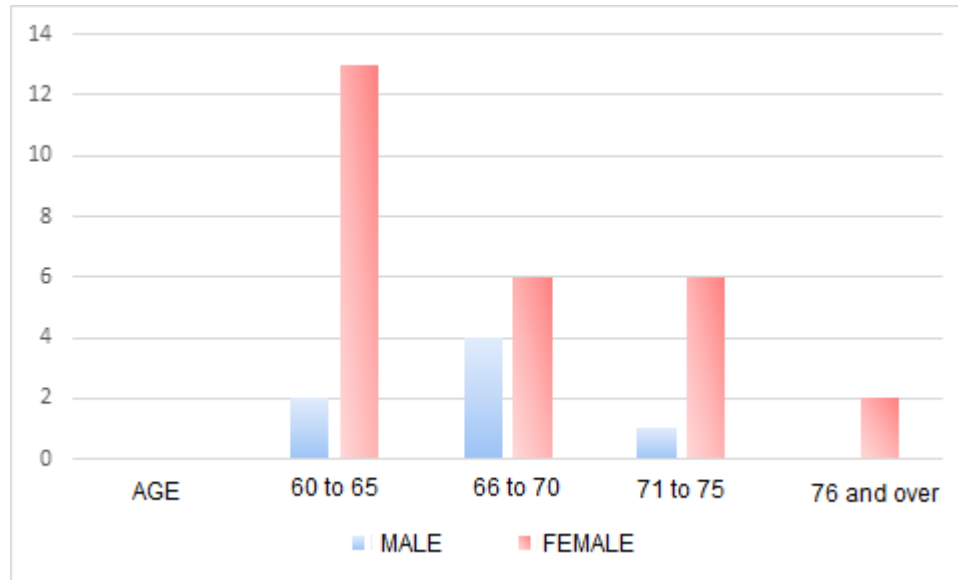
Table 1. Sample characteristics according to socioeconomic and demographic variables of elderly people assisted at the Specialized Center for Rehabilitation of Elderly People, São Luís-MA, 2018.

Variable	Category	n (%)
Sex	Female	27 (79.41%)
	Male	7 (20.59%)
Skin color	White	16 (47.06%)
	Non-white	18 (52.94%)
Marital status	Married	21 (61.76%)
	Single	2 (5.88%)
	Separated	4 (11.76%)
	Widowed	6 (17.65%)
	Other	1 (2.94%)
Origin	São Luís	14 (41.18%)
	Countryside	12 (35.29%)
	Others	8 (23.53%)
Total residents in the household	1	2 (5.88%)
	2	9 (26.47%)
	3	11 (32.35%)
	4	6 (17.65%)
	More than 4	6 (17.65%)

Source: prepared by the author based on data collection.

Graph 1 shows the age values of the elderly participants, according to gender. It was noticed that most participants were female. The data indicates that the female elderly were mostly aged between 60 and 65 years and that the males were between 66 and 70 years. The overall mean age of the participants, regardless of gender, was 67.09 years; the youngest was 60 years old and the oldest was 78. By gender, a total of 27 women (79.41%) and seven men (20.59%) were evaluated.

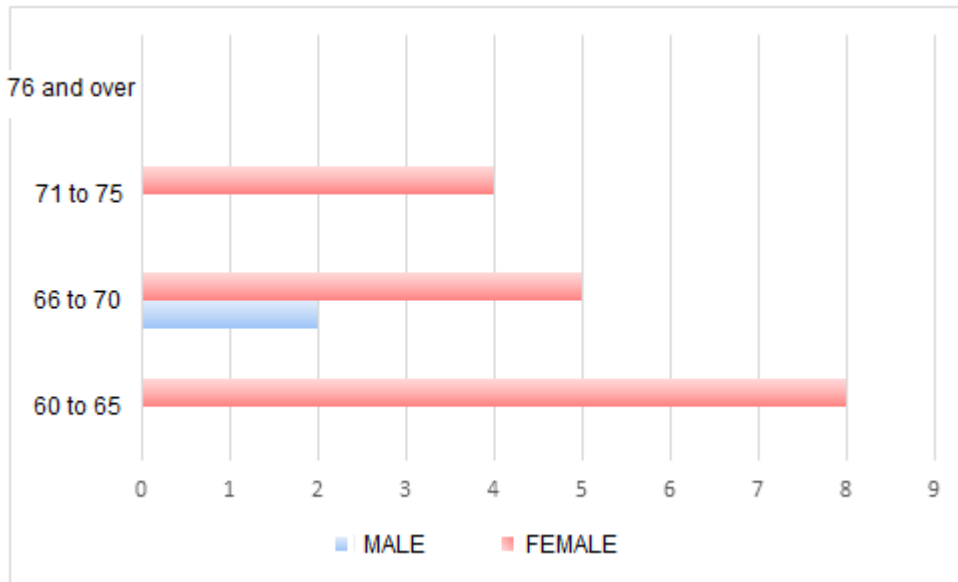
Graph 1. Relationship of ages according to gender of the elderly people assisted at the Specialized Center for Rehabilitation of Elderly People, São Luís-MA, 2018.



*Source: prepared by the author based on data collection.*

With regards to the diagnosis of chronic NCDs, findings show that the highest prevalence was in females aged 60 to 65 years. Of the evaluated elderly, 55.88% (n = 19) had at least one NCD and the average number of pathologies was  $2.0 \pm 1.4$ , with no statistically significant differences between genders (p = 0.935). Figure 2 shows the association between the diagnosis of chronic NCDs, age and gender.

Graph 2. Prevalence of chronic non-communicable diseases according to gender and age group in elderly people assisted at the Specialized Center for Rehabilitation of Elderly People, São Luís-MA, 2018.



Source: prepared by the author based on data collection.

Table 2. Distribution of elderly people according to the presence, number and type of existing non-communicable chronic diseases, São Luís-MA, 2018.

Health status	Frequency	
	N	%
Presence of chronic NCDs		
Yes	19	55.88
No	15	44.12
Number of chronic NCDs		
1	8	42.11
2	8	42.11
3	3	15.79
Type of chronic NCD		
Diabetes Mellitus	6	19.35
Arterial Hypertension	16	51.61
Obesity	9	29.03

Source: prepared by the author based on data collection.

Regarding health status, 55.88% (n = 19) stated they suffered from some chronic NCDs. Among those who reported having them, 42.11% (n = 8) reported having only one disease. As for the type of disease, the most recurrent was arterial hypertension (51.61%), followed by obesity (29.03%) and lastly diabetes mellitus (19.35%), as shown in Table 2.

Table 3. Body mass index (BMI) according to gender and age group, São Luís, MA, 2018.

Sex and age group	N	BMI		Me (min - max)
		Mean	± standard deviation	
<b>Male (years)</b>				
60 to 65	2	27,49	± 0,94	27,49(26,83-28,16)
66 to 70	4	25,19	± 9,64	25,00(16,84-33,93)
71 to 75	1	22,86		22,86
76 and over	-			
<b>Total</b>	<b>7</b>	<b>25,52</b>	<b>± 3,75</b>	<b>26,83(16,84-33,93)</b>
<b>Female (years)</b>				
60 to 65	13	27,95	± 6,48	27,73(21,26-44,93)
66 to 70	6	28,58	± 9,48	28,87(21,94-35,35)
71 to 75	6	27,13	± 3,66	25,3 (22,26 -30,74)
76 and over	2	27,03	± 1,38	27,02(26,05-28,00)
<b>Total</b>	<b>27</b>	<b>27,84</b>	<b>± 4,77</b>	<b>27,73(21,26-44,93)</b>

SD: standard deviation; max: maximum value; Me: median; min: minimum value.

*Source: prepared by the author based on data collection.*

Table 3 shows the distribution of BMI for men and women according to age group. The median total BMI was 26.83 (minimum 16.84 and maximum 33.83) in males and 27.73 (minimum 21.26 and maximum 44.93) in females.

Table 4 illustrates the distribution of frequencies and patterns of food consumption, obtained from the foods present in the FFQ applied to the elderly of the research. There is a significant daily frequency of consumption of bread (32.3%), rice (47.1%), milk (61.8%), coffee (58.8%) and bananas (79.4%). Fish (64.7%), soup (26.5%) and leafy vegetables (38.2%) were reported to have been consumed twice a week. A total of 41.2% and 88.2% conveyed not consuming sugar and soda, respectively.



Table 4. Distribution of food consumption frequencies of the elderly people assisted at the Specialized Center for Rehabilitation of Elderly People, São Luís-MA, 2018.

Food	Food Consumption Frequency													
	0		1		2		3		4		5		6	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Bread	10	29.4	11	32.3	4	11.8	1	2.9	4	11.8	3	8.8	1	2.9
Rice	4	11.8	16	47.1	12	-	-	2	5.9	-	-	-	-	-
Flour	16	47.1	4	11.8	4	11.8	-	-	5	14.7	4	11.8	1	2.9
Pasta	8	23.5	2	5.9	-	-	13	38.2	6	17.6	4	11.8	1	2.9
Beans	9	26.5	9	26.5	5	14.7	-	-	2	5.9	8	23.5	1	2.9
Red meat	2	5.9	3	8.8	-	-	12	35.3	14	41.2	2	5.9	1	2.9
Chicken	4	11.8	2	5.9	-	-	6	17.6	18	52.9	-	-	4	11.8
Fish	3	8.8	3	8.8	-	-	4	11.8	22	64.7	2	5.9	-	-
Soup	10	29.4	4	11.8	-	-	7	20.6	9	26.5	3	8.8	1	2.9
Milk	1	2.9	21	61.8	10	29.4	1	2.9	1	2.9	-	-	-	-
Leafy vegetables	6	17.6	9	26.5	4	11.8	2	5.9	13	38.2	-	-	-	-
Banana	-	-	27	79.4	5	14.7	1	2.9	1	2.9	-	-	-	-
Apple	5	14.7	11	32.4	2	5.9	5	14.7	8	23.5	3	8.8	-	-
Sugar	14	41.2	14	41.2	6	17.6	-	-	-	-	-	-	-	-
Coffee	2	5.9	20	58.8	10	29.4	1	2.9	1	2.9	-	-	-	-
French fries	32	94.1	1	2.9	-	-	-	-	1	2.9	-	-	-	-
Soft drinks	30	88.2	-	-	-	-	2	2.9	2	2.9	-	-	-	-

0 = does not consume; 1 = once/day; 2 = twice/day; 3 = once/week; 4 = twice/week; 5 = once/month; 6 = 2 or more times/month.

Source: prepared by the author based on data collection.

As for the relation between food intake and chronic NCDs, only the variable rice consumption showed a statistical significant association ( $p = 0.005$ ) (Table 5).

Table 5. Association of dietary variables and presence of chronic non-communicable diseases (NCDs) of elderly people assisted at the Specialized Center for Rehabilitation of Elderly People, São Luís-MA, 2018.

Variables	N	Arterial hypertension N (%)	Diabetes mellitus N (%)	Obesity N (%)	p*
Milk consumption					0.073
1 to 2 times/day	29	16 (100%)	6 (100%)	7 (77.78)	
1 to 2 times/week	2	-	-	2 (22.22)	
1 to 2 times/month	-	-	-	-	

Never	-	-	-	-	
Consumption of leafy vegetables					0.945
1 to 2 times/day	14	8 (50%)	2 (33.33%)	4 (44.44%)	
1 to 2 times/week	12	6 (37.50%)	3 (50%)	3 (33.33%)	
1 to 2 times/month	-	-	-	-	
Never	5	2 (12.50%)	1(16.67%)	2(22.22)	
Consumption of rice					0.005
1 to 2 times/day	24	12 (75%)	4 (66.67%)	8 (88.89%)	
1 to 2 times/week	4	2 (12.50%)	1 (16.67%)	1 (11.11%)	
1 to 2 times/month	-	-	-	-	
Never	3	2 (12.50%)	1 (16.67%)	-	
Consumption of bread					0.716
1 to 2 times/day	15	8 (50%)	2 (33.33%)	5 (55.56%)	
1 to 2 times/week	5	2 (12.50%)	2 (33.33%)	1 (11.11%)	
1 to 2 times/month	2	1 (6.25%)	1 (16.67%)	-	
Never	9	5 (31.25%)	1 (16.67%)	3 (33.33%)	
Consumption of red meat					0.845
1 to 2 times/day	1	-	-	1 (11.11%)	
1 to 2 times/week	24	13 (81.25%)	5 (83.33%)	6 (66.67%)	
1 to 2 times/month	4	2 (12.50%)	1 (16.67%)	1 (11.11%)	
Never	2	1 (6.25%)	-	1 (11.11%)	
Consumption of sugar					0.297
1 to 2 times/day	12	6 (37.50%)	1 (16.67%)	5 (55.56%)	
1 to 2 times/week	-	-	-	-	
1 to 2 times/month	-	-	-	-	
Never	19	10 (62.50%)	5 (83.33%)	4 (44.44%)	

\*p = Pearson's chi-square

Source: prepared by the author based on data collection.

## Discussion

In the present study, the average age of the elderly was 67.09 years, with a lower value of 60 years and higher of 78 years. To compare, Nogueira *et al.* (2016) evaluated 45 elderly people whose age ranged from 60 to 93 years, with an average of 74.2 years, a result much higher than this study.

Of the the elderly in the sample population, 91.44% (n = 64) were female, most of them aged 60 to 69 years (43 women), while the minority were male, six men (8.57%), five of whom were between 60 and 69 years old.

Candido and Melo (2016) evaluated the nutritional aspects in a sample of 42 elderly assisted in the elderly health department in Juiz de Fora (MG), and found that 57.1% (n = 24) were self-reported whites, about 71.4% stated that they did not live alone, and 45.2% were married or lived with a partner. Contrary to this study, most of the elderly in our present analysis (52.94%) were non-whites, 97.12% did not live alone, and 61.75% were married.

Concerning chronic NCDs, hypertension was the most frequent in the study population, affecting 51.61% of the elderly, followed by obesity (29.03%) and diabetes mellitus (19.35%). More than half of the participants (55.88%) reported having at least one chronic NCD. The study by Venturini *et al.* (2015) with a sample of 427 individuals also found hypertension as the most frequent disease, affecting 51.7% of the elderly. Moreover, in the study by Pereira, Nogueira & Silva (2015) about the quality of life and health status of elderly people in the Sertão Central do Ceará, with a sample of 372 participants, the main diseases or comorbidities reported by the participants were hypertension (46.2%) followed by diabetes (18.0%).

Regarding nutritional status, the mean BMI value of 26.83 kg/m<sup>2</sup> - eutrophic - was found for both genders. The study done by Flores *et al.* (2016) on diet quality among elderly people with a differentiated family arrangement in the Vale do Sinos region, Rio Grande do Sul, revealed a higher proportion of overweight in both gender group, with a mean BMI value of 29.3 kg/m<sup>2</sup>. Among the elderly studied for nutritional status based on BMI by Nogueira *et al.* (2016), the average BMI was 28.2 kg/m<sup>2</sup>, characterizing the prevalence of overweight in the sample population.

Despite evaluating only one component of food consumption to classify the diet, the VIGITEL 2017 showed the regular consumption of vegetables in 45.1% of the population aged 65 years and over, a result that was different from that of the present research regarding consumption of leafy vegetables (38.2%).

Regarding the relation between food consumption and nutritional risk, Candido and Melo (2016) found a tendency of increasing fruit consumption, which was predominant in the population, with a frequency of 5 to 7 days a week. Despite using different methodologies, the results show that most individuals met the recommendation of fruit consumption. In this study, the consumption of bananas by the participants (79.4%) was considered very high.

Monteiro and Maia (2016) assessed qualitatively the nutritional adequacy of registered menus and

showed that the average consumption of vegetables was 22.5% and of milk and dairy products was 30%, well-below the results of the present study, which showed a consumption of 38.2% of leafy vegetables and 61.8% of milk.

## Conclusion and Recommendations

There is a high percentage of elderly people with chronic NCDs in the studied elderly sample population. The dietary analysis found that the daily consumption of leafy vegetables was very low, despite the fact that they are important groups for maintaining good health, and reducing the risk of the onset of chronic NCDs.

Among the mentioned NCDs, the most frequent was hypertension, in addition to a high prevalence of obesity and diabetes mellitus. There is therefore an evident relationship between the frequency of these diseases and inappropriate eating habits, since these diseases are substantially related to food consumption. Given the above findings, we emphasize the need for constant monitoring of dietary patterns and encouraging healthy eating practices in order to avoid the effects of an unbalanced diet on general health and the incidence of morbidity in the elderly. In this context, it is necessary to carry out educational strategies with these elderly in order to promote healthier habits in relation to their food consumption, as these habits can become generators of a better quality of life and consequently reducing the risk of disease.

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## HOW TO CITE THIS PAPER

Léa Fontinele, S., Duque, E. & Pistelli, S. (2019). Eating Habits and Diseases Associated with the Aging Process. *International Humanities Studies*, 6(3), 1-14.

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