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ORIGINAL ARTICLE

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Socioeconomic and Demographic Correlates of Nutritional Status in Elderly Urban Dwellers of Havana, Cuba

Leonardo Cristiá-Lara **Orlando L. Mendiluza** **Abel F. Brígido** **Aniette M. Martínez** **Sahilí Cristiá-Lara**

Policlínico Universitario Ana Betancourt Calle 5ta. No. 1404 entre 14 y 16, Havana, Cuba lcristialara@gmail.com / lescanoorlando88@gmail.com / abelfb1967@gmail.com / aniettemartinez@infomed.sld.cu / scristialara@gmail.com

ABSTRACT

Background: Malnutrition among the elderly constitutes a significant public health concern in Cuba and the wider Caribbean. Its frequent onset in the region is primarily driven by age-related medical conditions, unhealthy dietary patterns, and low levels of physical activity. There is also a growing body of evidence suggesting that socioeconomic and demographic factors contribute to the risk of malnutrition and may serve as modifiable determinants of weight regulation and nutritional health.

Aims: The primary objective of this study was to investigate the prevalence of underweight, overweight, and obesity in older adults residing in urban Havana, Cuba, in relation to various socioeconomic and demographic factors.

Methods: A cross-sectional descriptive study was conducted with 320 older Cubans, aged 60–95 years, from the urban neighborhood of Miramar, Havana. Body weight and height were measured using standard procedures. The World Health Organization (WHO) body mass index (BMI) cut-offs were applied to classify participants as underweight, overweight, or obese. Socioeconomic and demographic data were also collected. The influence of these variables on nutritional status was analyzed employing descriptive statistics and logistic regression models. Furthermore, cluster analysis was performed to identify the specific socioeconomic groups at higher risk of either underweight or overweight/obesity.

Results: The study found a prevalence of 3.0% for underweight, 45.7% for overweight, and 19.7% for obesity. Participants living in small elderly households composed of elderly individuals, those who were employed, or those with low educational level were more likely to be underweight. Conversely, individuals in large, cross-generational households, those who were retired, or those with a high educational level displayed a greater likelihood of being overweight and obese. Cluster analysis further indicated that the effects of these socioeconomic correlates are additive. The highest risk for being underweight was observed in participants with low education, living in small elderly households and who were still employed. In contrast, those with high education, residing in large, cross-generational households, and who were retired faced a greater risk of overweight/obesity.

Conclusions: Underweight, overweight and obesity in older adults in Havana are significantly associated with distinct socioeconomic and demographic factors. The strongest associations were found with employment status, educational level, and household size, both individually and in combination. Underweight status showed a positive correlation with low educational level, employment, and residence in small elderly households. In contrast, overweight/obesity was positively correlated with high educational level, retirement status, and living in large cross-generational households. Incorporating these findings into local public health policy and clinical practice could significantly improve the management of malnutrition in this population.

Keywords: Underweight, Overweight, Elderly, Socioeconomic risk, Cuba, Caribbean.

Article Information

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Corresponding author: Leonardo Cristiá-Lara
E-mail: lcristialara@gmail.com
Tel. (+53) 58052092

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Prof. Khaled Méghit Boumediene

Article reviewed by:
Dr. Emmanuel Bidemi Bernice
Prof. Basil H. Aboul-Enein

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1 INTRODUCTION

The combined prevalence of both underweight and overweight in the Caribbean is among the highest worldwide (NCD-Risk, 2024). This trend stems from the combination of various biological, socioeconomic, and cultural factors that have converged to negatively affect optimal diet and physical activity patterns in recent decades (Ichinohe *et al.,* 2005; Simo-Tabue *et al.,* 2023; Tan *et al.,* 2025). Underweight is often a sign of undernutrition and occurs when nutrients or energy are insufficiently supplied, in contrast, overweight and obesity usually result from excessive energy consumption. In elderly populations, these nutritional imbalances are particularly common, often linked to energy-dense diet, a sedentary lifestyle, and pathological conditions leading to impaired nutrition (Corish & Bardon, 2019).

Numerous nutrition health studies have been carried out in Cuba (Bonet *et al.,* 2018; Coqueiro *et al.,* 2009; López *et al.,* 2021) and the Caribbean (Henry, 2015; Ichinohe *et al.,* 2005; Simo-Tabue et *al.*, 2023; Tan *et al.,* 2025). Several of these investigations have demonstrated that prevalence of malnutrition is disproportionate across different population groups (Bonet *et al.,* 2018; Coqueiro *et al.,* 2009; Ichinohe *et*

al., 2005;). The elderly are among the most vulnerable groups due to age-associated pathologies associated with increased nutritional risk (Cabrera *et al.,* 2015; González *et al.,* 2017; Simo-Tabue *et al.,* 2023; Tan *et al.,* 2025). Even in cases of healthy ageing, nutritional status can be compromised by deficiencies in nutrient metabolism (Palmer *et al.,* 2022). There is growing evidence indicating a strong relationship between nutritional health and socioeconomic, demographic, and cultural factors (Bonet *et al.,* 2018; Cabrera *et al.,* 2015; Coqueiro *et al.,* 2009; González *et al.* 2017; Ichinohe *et al.,* 2005; Simo-Tabue *et al.,* 2023; Tan *et al.,* 2025).

Cuba is an island country located in the western part of the Caribbean Sea has a population of approximately 10 million, with its capital, Havana, serving as one of the largest urban centers of the region. The socioeconomic, and demographic influences on the Cuban population are multifaceted. The country's heritage and customs maintain a strong presence of West African and Spanish cultures. Local food production has been significantly influenced by Soviet-inspired models for urbanization and industrialization. The ongoing privatization of local food markets and increasing international trade are promoting dietary shifts towards industrially processed and energy-dense foods. Concurrently, demographic aging is placing a growing burden on the public health system. These converging factors make Cuba a compelling context in which to assess the socioeconomic and demographic dimensions of nutritional health in older adults.

The potential of socioeconomic variables as modifiable risk factors for the prevention of underweight, overweight and obesity in older Cubans warrants investigation. The integration of these variables into public policies and medical interventions aimed at promoting healthy aging could lead to improved outcomes. Therefore, this study explores the prevalence of underweight, overweight and obesity in a sample of urban-dwelling older Cubans in Havana and examine their associations with socioeconomic and demographic characteristics.

2 Material and Methods

2.1 Study Design and Population

An exploratory cross-sectional study was carried out in older adults aged ≥ 60 years living in Miramar, Havana. Convenience sampling was employed. Subjects with psychological and/or physical health impairments that compromised their autonomous capacity to feed themselves or perform daily life activities were excluded. A total of 320 individuals voluntarily agreed to participate in the study and provided their informed consent. The research adhered to the ethical principles and guidelines of the Declaration of Helsinki on the protection of human subjects in research (World Medical Association, 2013).

2.2 Nutritional Status

Nutritional status was determined based on WHO criteria for BMI (underweight: < 18.5 kg/m^2; normal weight: 18.5–24.9 kg/m^2; overweight: 25.0–29.9 kg/m^2; obesity: ≥ 30.0 kg/m^2) (WHO, 1998). BMI was calculated by dividing a person's body weight in kilograms by their height in meters squared and expressed in kg/m^2. Body weight was measured with a scale (InBody H20N) to the nearest 0.5 kg. Height was measured with a stadiometer (Salus) at head level to the nearest centimeter with the subject standing barefoot with their feet together. All measurements were performed following Airlie House Conference guidelines (van den Berg *et al.,* 2019).

2.3 Socioeconomic and Demographic Variables

Socioeconomic and demographic characteristics were obtained during scheduled face-to-face interviews using a standardized questionnaire. Data related to demographic (sex, age, educational level) and socioeconomic characteristics (marital status, household size, household composition, home ownership and employment) were obtained. Household composition was classified into two categories: (i) elderly, where all household members were aged ≥ 60 years, and (ii) cross-generational, where one or more household members were aged < 60 years.

2.4 Statistical Analysis

Continuous variables are presented as the mean and standard deviation (SD), while categorical variables are presented as absolute (n) and relative frequencies (%). Statistical differences between continuous variables were examined using Student's *t*-test and the χ^2 test for categorical variables. The level of statistical significance was set at $p = 0.05$ in all cases. The associations between socioeconomic and demographic variables and nutritional status (underweight and overweight/obesity) were assessed by univariate logistic regression analyses. Odds-ratios (OR) with 95% confidence intervals (CI) were computed.

Furthermore, subjects were grouped based on the similarity of their socioeconomic and demographic characteristics using cluster analysis. Principal component analysis (PCA) was carried out following the methods of Horn and Velicer (Coste et *al.*, 2005). Agglomerative hierarchical cluster analysis based on the Ward method (Everitt, 1979) was employed to determine the optimal number of clusters. The final clusters were selected based on PCA, the rescaled distances evident in the hierarchical cluster dendrograms, and statistical criteria such as R^2, pseudo-*F*, pseudo-t^2 and the cubic clustering criterion. Differences in the prevalence of underweight or overweight prevalence were evaluated between the socioeconomic clusters. OR values were determined for

each cluster by selecting the healthiest cluster as the reference group. The healthiest cluster was defined as the one with the highest proportion of subjects with normal weight as well as, the lowest for underweight, overweight and obesity. All statistical analysis were conducted using the IBM SPSS Statistics version 26.

3 Results

3.1 Underweight and Overweight Prevalence

The prevalence of underweight, normal weight, and overweight among all participants is shown in Figure 1. The mean values for the anthropometric measurements were 163.1 ± 5.2 cm for height, 69.8 ± 17.4 kg for weight, and 26.1 ± 5.4 kg/m^2 for BMI. The sample included both underweight and overweight/obese individuals. Underweight was detected in only 3.0 % of older adults, while 65.4 % were overweight, of which 19.7 % were obese.

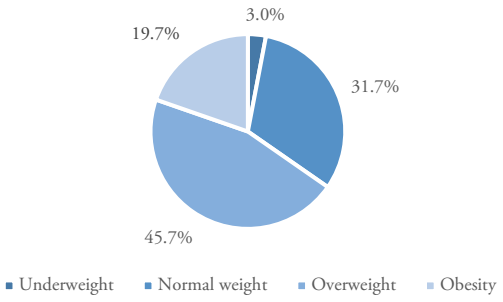

Figure 1. Prevalence of Underweight, Overweight and Obesity in Study Subjects

3.2 Socioeconomic and Demographic Characteristics of the Sample

In the total sample, females were more represented than males (60.4 % vs 39.6 %, respectively). The mean age was 72.7 years, with most participants (74.5 %) falling within the 60–79 years age group. The educational level was high, with 70.0 % of participants having attained ≥12 years of education. A significant portion of the sample was divorced or widowed (58.0%). Large and cross-generational households were prevalent (50.6% and 65.5%, respectively). Most participants were retired (60.6%) and did not own their homes (55.9%)

3.3 Socioeconomic and Demographic Variables According to Nutritional Status

Table 1 displays socioeconomic and demographic characteristics by nutritional status. Sex, age, and marital status did not differ significantly across groups, though underweight and overweight/obesity were more common in women and those divorced or widowed. Significant differences were found for education, household size/composition, home ownership, and employment. The underweight group had higher proportions of individuals with low education, those living in small elderly households, homeowners, and employed individuals. Conversely, the overweight/obesity group had higher proportions of highly educated individuals, those living in large cross-generational households, retirees, and non-homeowners.

3.4 Socioeconomic and Demographic Correlates with Underweight and Overweight/Obesity

OR values of underweight and overweight/obesity by each socioeconomic and demographic variable are detailed in Table 2. Underweight was significantly associated with low educational level, small elderly-only households and employment. Overweight/obesity was significantly associated with high educational level, large cross-generational households, and retirement.

3.5 Identified Socioeconomic and Demographic Clusters

PCA identified four socioeconomic factors with significant effects on BMI and prevalence of underweight and overweight/obesity. The first factor segregated by household size, the second by household composition, the third by employment and, the fourth by educational level. Table 3 present the socioeconomic and demographic characteristics of identified clusters. Grouping the participants by PCA similarities resulted in the following clusters:

Cluster 1 (n = 70, 21.9 %): This cluster included members of small cross-generational households, employed and with high education level. Females tended to be more prevalent with a female to male ratio of 1.3. The proportion of subjects married or in consented unions and those divorced or widowed was similar. Most were not homeowners.

Cluster 2 (n = 57, 17.8 %): This cluster included members of small elderly families, often with low levels of education and employed. Males were slightly more prevalent with a female to male ratio of 0.9. Most were divorced or widowed and not homeowners.

Cluster 3 (n = 142, 44.4 %): This cluster included members of large cross-generational families, with high education level and retired. Females were more prevalent with a female to male ratio of 1.6. The proportion of subjects who were married or in consensual unions was similar to those who were divorced or widowed. Most were homeowners.

Table 1. Socioeconomic and Demographic Characteristics According to Nutritional Status

Variable	Underweight	Normal Weight	Overweight/Obesity	*p*
Sex (n, %) [a]				0.41
Male	9 (7.1)	35 (27.6)	83 (65.4)	
Female	20 (10.4)	60 (31.1)	113 (58.5)	
Age (mean ± SD) [a]	73.6 ± 9.4 y	73.1 ± 9.1 y	72.4 ± 8.8 y	0.45
Age group (n, %) [a]				0.65
60-79 years	23 (9.7)	74 (31.1)	141 (59.2)	
≥ 80 years	6 (7.3)	21 (25.6)	55 (67.1)	
Educational level (n, %) [b]				0.00
Low (< 12 y of education)	20 (10.6)	42 (49.4)	34 (35.4)	
High (≥ 12 y of education)	9 (8.5)	53 (22.6)	162 (72.3)	
Marital status (n, %) [a]				0.32
Divorced/widowed	19 (10.2)	59 (31.7)	107 (57.8)	
Married/union	10 (7.5)	36 (26.9)	89 (65.9)	
Household size (n, %) [b]				0.00
1 member	17 (29.3)	19 (32.8)	22 (37.9)	
2 members	10 (10.0)	26 (26.0)	64 (64.0)	
≥ 3 members	2 (1.2)	50 (30.9)	110 (67.9)	
Household composition (n, %) [b]				0.00
Elderly	24 (21.8)	48 (43.6)	38 (34.5)	
Cross-generational	5 (2.4)	47 (22.4)	158 (75.2)	
Home ownership (n, %) [b]				0.00
Yes	19 (13.5)	57 (40.4)	65 (46.1)	
No	10 (5.6)	38 (21.2)	131 (73.2)	
Employment (n, %) [b]				0.00
Employed	25 (19.8)	44 (42.5)	50 (39.7)	
Retired	4 (2.1)	51 (22.0)	146 (75.3)	

Note: [a] no significant differences between nutritional categories [b] significant differences between all nutritional categories

Table 2. Odd Ratio (OR) of Underweight and Overweight/Obesity by Socioeconomic and Demographic Variables

Variable	Underweight			Overweight/obesity		
	%	OR	95% CI	%	OR	95% CI
Sex						
Male	20.5	1.0	Ref.	70.3	1.0	Ref.
Female	25.0	1.3	0.5, 3.2	65.3	0.8	0.5, 1.3
Age group						
60-79 years	23.7	1.0	Ref.	65.6	1.0	Ref.
≥ 80 years	22.2	0.9	0.3, 2.6	74.4	1.4	0.8, 2.4
Educational level						
Low (< 12 y of education)	27.41	1.0	Ref.	44.7	1.0	Ref.
High (≥ 12 y of education)	17.6	**0.4**	**0.1, 0.9**	75.3	**3.8**	**2.2, 6.5**
Marital status						
Single/divorced /widowed	24.4	1.0	Ref.	64.7	1.0	Ref.
Married/union	21.7	0.9	0.3, 2.1	70.9	1.3	0.8, 2.2
Household size						
Small (1 member)	47.2	1.0	Ref.	50.7	1.0	Ref.
Small (2 members)	52.8	0.4	0.2, 1.2	71.1	**2.1**	**1.0, 4.6**
Large (≥ 3 members)	3.9	**0.1**	**0.0, 0.2**	69.8	**2.0**	**0.9, 3.9**
Household composition						
Elderly	34.1	1.0	Ref.	44.2	1.0	Ref.
Cross-generational	10.6	**0.2**	**0.1, 0.7**	77.1	**4.3**	**2.5, 7.3**
Home ownership						
Yes	21.1	1.0	Ref.	53.3	1.0	Ref.
No	22.2	1.1	0.4, 2.9	77.5	1.8	1.0, 4.0
Employment						
Employed	26.8	1.0	Ref.	49.5	1.00	Ref.
Retired	12.5	**0.4**	**0.1, 1.3**	76.8	**3.4**	**2.0, 5.7**

Note: Ref., reference category. Cells in bold indicate statistically significant OR.

Table 3. Socioeconomic and Demographic Clusters in Older Cubans of Havana

Variables	Cluster 1	Cluster 2	Cluster 3	Cluster 4	*p*
Sex (n, %) [a]					0.05
Male	30 (42.9)	29 (50.9)	55 (38.7)	13 (25.5)	
Female	40 (57.1)	28 (49.1)	87 (61.3)	38 (74.5)	
Age (mean ± SD) [a]	73.0 ± 9.1	71.9 ± 8.7	72.9 ± 8.5	72.6 ± 10.1	0.87
Educational level (n, %) [b]					0.02
Low (< 12 y of education)	27 (38.6)	23 (40.4)	37 (26.1)	9 (17.6)	
High (≥ 12 y of education)	43 (61.4)	34 (59.6)	105 (73.9)	42 (82.3)	
Marital status (n, %) [b]					0.00
Divorced/widowed	29 (41.4)	47 (82.5)	72 (50.7)	37 (72.5)	
Married/union	41 (58.6)	10 (17.5)	70 (49.3)	14 (27.5)	
Household size (n, %) [b]					0.00
Small (1 member)	0 (0.0)	30 (52.6)	0 (0.0)	28 (54.9)	
Small (2 members)	18 (25.7)	27 (47.4)	32 (22.5)	23 (45.1)	
Large (≥ 3 members)	52 (74.3)	0 (0.0)	110 (77.5)	0 (0.0)	
Household composition (n, %) [b]					0.00
Elderly	7 (10.0)	47 (82.5)	22 (15.5)	34 (66.7)	
Cross-generational	63 (90.0)	10 (17.5)	120 (84.5)	17 (33.3)	
Homeownership (n, %) [b]					0.00
Yes	7 (10.0)	9 (15.8)	116 (81.7)	47 (92.2)	
No	63 (90.0)	48 (84.2)	26 (18.3)	4 (7.8)	
Employment (n, %) [b]					0.00
Employed	70 (100.0)	56 (98.3)	0 (0.0)	0 (0.0)	
Retired	0 (0.0)	1 (1.7)	142 (100.0)	51 (100.0)	

Note: ([a]) no significant differences between clusters ([b]) significant differences between clusters

Cluster 4 (n = 51, 15.9 %): This cluster included members of small elderly families, with high levels of education and retired. Females were more prevalent with a female to male ratio of 2.9. Most individuals were divorced or widowed and were homeowners.

3.6 Socioeconomic and Demographic Clusters and the Risk of Underweight and Overweight/Obesity

As presented in Figure 2, mean BMI values and the prevalence of underweight and overweight/obesity differed significantly between clusters. Cluster 2 exhibited the lowest mean BMI value (21.5 ± 4.4 kg/m^2), the highest underweight prevalence (43.9 %), the lowest of overweight prevalence (21.1 %), and no cases of obesity.

In contrast, clusters 3 and 4 displayed the highest mean BMI (28.1 ± 4.9 kg/m^2 and 26.5 ± 4.6 kg/m^2, respectively), a low prevalence of underweight (0.7 % and 3.9 %, respectively), and the highest proportions of overweight/obesity (76.1 % and 74.5 %, respectively). Furthermore, cluster 3 displayed the highest prevalence of obesity (31.7 %). Lastly, cluster 1 presented a mean BMI value of 25.6 ± 4.4 kg/m^2, a low underweight prevalence (1.4 %), a considerable overweight/obesity (54.2%), but few cases of obesity (7.1%).

The odds ratios (OR) for underweight and overweight/obesity within each socioeconomic and demographic cluster are presented in Table 4. Cluster 1 was selected as the reference group because it exhibited the highest proportion of subjects with normal weight, and low proportions of extreme malnutrition types (underweight and obesity). The convergence of limited family support networks (small elderly households), employment, and a low educational level significantly increased the risk of underweight. In contrast, the convergence of large family

Table 4. OR of underweight and overweight/obesity for each socioeconomic cluster

Cluster	Overweight			Overweight/obesity		
	%	OR	95% CI	%	OR	95% CI
Cluster 1 (n = 70)	1.4	1.0	Ref.	54.3	1.0	Ref.
Cluster 2 (n = 57)	43.9	**38.8**	**4.9, 309.0**	21.1	0.5	0.2, 1.2
Cluster 3 (n = 142)	0.7	0,9	0.1, 15.7	76.1	**2.9**	**1.4, 4.9**
Cluster 4 (n = 51)	3.9	5.6	0.5, 68.5	74.5	**2.8**	**1.2, 6.4**

Note: Ref., reference cluster. Cells in bold indicate statistically significant OR.

support networks (large cross-generational households), retirement and a high educational level significantly increased the likelihood of overweight/obesity.

design of regional and local public health policies. Promoting healthier diets and physical activity levels (Tan et *al.*, 2025) could serve as starting point for new public health

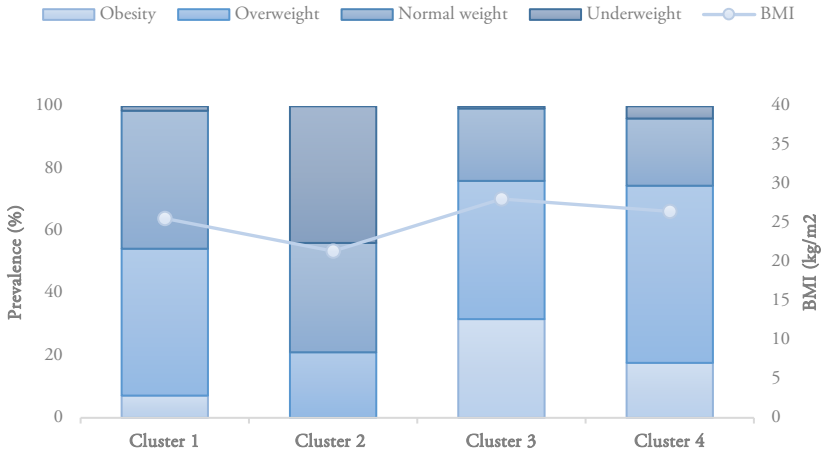

Figure 2. Mean BMI values and prevalence of underweight, overweight and obesity in each socioeconomic cluster

4 Discussion

In older adults of Havana, overweight/obesity was far more common than underweight (3.0 % vs 65.4 %, respectively). These findings differ from prior reports in Havana (underweight: 33.0 %; overweight/obesity: 29.6 %) (Coqueiro et *al,* 2009) but are consistent with recent trends in adults in western Cuba (underweight: 5.6 %; overweight/obesity: 47.8 %) (Jiménez et *al.*, 2012). The observed geographic variations could reflect a disproportional distribution of obesogenic factors across Cuba and a considerable convergence of these factors in the urban community of Miramar, Havana.

When compared to the broader Caribbean region, our observations align with the dramatic shift in the nutritional status observed in adult population in the last decades. In most countries across the region, the prevalence of underweight has declined, while overweight has increased (NCD-risk, 2017). Currently, the Caribbean is one of the regions with the highest rates of overweight and obesity in the world. Prevalence values in older adults range from 20 % in Haiti to over 50 % in The Bahamas and Saint Kitts and Nevis (NCD-risk, 2024). This upward trend is alarming and is estimated to continue if current dietary and physical activity patterns remain unchanged. Combined, overweight and its associated morbidities favor increased fragility and mortality in older adults (González et *al.* 2017; Simo-Tabue et *al.*, 2023; Tan et *al.*, 2025) and should be addressed in the strategies to address ongoing socioeconomic transformations that are promoting increased overweight/obesity.

Additionally, this study provides evidence that certain social and economic factors contribute differentially to the likelihood of underweight and overweight in older Cubans from Havana. While some factors, such as sex, age and marital status, did not appear to be related to either nutritional category (Table 3), small, elderly-only households, employment, and a low educational level were strongly associated with an increased risk of underweight. Conversely, large, cross-generational households, retirement, and a high educational level were associated with a higher risk of overweight/obesity. Moreover, cluster analyses suggest that the effects of these socioeconomic correlates on nutritional status may be additive. Participants with a low educational level who were also were employed and members of small, elderly-only households were the most vulnerable to underweight. In contrast, those with a high educational level who were retired and members of large, cross-generational households exhibited higher odds of overweight and obesity.

The identified correlation patterns for sex, age, and educational level are not consistent with previous reports in Cuba and the rest of the Caribbean (Coqueiro et *al.*, 2009; Ichinohe et *al.*, 2005; IHE, 2018). The SABE study in Havana found that underweight was more frequent in males and adults aged 90–100 years and overweight/obesity in females aged 60–69 years (Coqueiro et *al.*, 2009). In Jamaica, older females who were unmarried and had a low

educational level exhibited an increased risk of overweight and obesity (Ichinohe *et al.,* 2005). In Haiti, malnutrition was more common in older females, and those with higher educational levels appeared to have an increased likelihood of being overweight and obese (IHE, 2018). This heterogeneity could stem from differences in sample composition and cofounding variables such as ethno-genetic background, diet, and physical activity patterns (Corish and Bardon, 2019).

In our sample, household composition exhibited the highest effects on nutritional status. Older adults living in households with larger number of young members had strong support networks, comfortable socio-economic conditions, increased sedentary behavior, and higher risk of overweight and obesity. Conversely, elders living alone or in small households were often compelled to adopt "active" lifestyles (i.e., holding multiple jobs, acting as caregivers, providers) to meet theirs and their daily needs and those of their families, thereby exhibiting a higher risk of underweight.

Employment also influenced nutritional status and reflected patterns in educational level. Underweight was prevalent in participants with one or more jobs, whereas overweight/obesity was common among retirees. Elderly workers often had low education levels, were limiting them to jobs with high physical demands and low income (i.e., farming, gardening, cleaning, and maintenance personnel), and restricted dietary options. In contrast, retirees often had high education level, were beneficiaries of comfortable pension plans, and exhibited sedentary lifestyles with diets rich in energy-dense foods.

Limitations of the study

The interpretation and use of the information provided by this study are subject to certain restrictions. Future research should address the following limitations:

- **Selection Bias:** The study sample consisted of older Cubans in Havana; therefore, the generalization of the identified patterns to other populations is limited.
- **Confounding Variables:** Possible ethno-genetic factors, which have been shown to significantly affect the reliability of BMI cut-offs and the risk of overweight/obesity, were not accounted for. The identification of specific phenotypes in the study sample was avoided due to the high degree of admixture among participants, so residual confounding due to genetic makeup may exist.
- **Study design:** The cross-sectional nature of our research does not allow for the establishment of cause-and-effect relationships. A longitudinal study providing information on individual nutritional health trajectories over time should be carried out.

5 Conclusions

The prevalence of underweight, overweight and obesity in older adults in Havana correlates with distinct socioeconomic and demographic factors. Subjects with low educational level, who were employed and living in small elderly-only households exhibited an increased risk of underweight. Conversely, older adults with a high educational level, who were retired, and living in large, cross-generational households demonstrated higher risk of overweight/obesity. This information could be incorporated into current public health policies to develop more effective and community-tailored strategies.

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