

# Healthy Lifestyles Associated With Socioeconomic Determinants in the Older Adult Population

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Elizabeth Roldán González<sup>1</sup> , Piedad Rocío Lerma Castaño<sup>2</sup> ,  
Adriana Yulieth Aranda Zemanate<sup>1</sup>, Ángela Giovana Caicedo Muñoz<sup>1</sup>, and  
Gisella Bonilla Santos<sup>3</sup>

## Abstract

**Introduction/Objective:** The evaluation of lifestyle in older adults and the study of socioeconomic determinants becomes an essential indicator of the health conditions of older adults. The purpose of this study was to establish the relationship between socioeconomic factors and healthy lifestyles in older adults. **Methods:** Study with a quantitative approach, descriptive type, non-experimental design, cross-sectional in a sample of 407 elderlies who have applied a self-designed instrument for socioeconomic characterization and the FANTASTIC test to assess lifestyle. For data analysis, a bivariate analysis was applied using chi2 and multivariate analysis using ordinal logistic regression. **Results:** 53% of elderlies aged between 60 and 70 years reported their lifestyle as excellent and very good. Age, average household income, and perceived health status are associated with healthy lifestyles in older adults. **Conclusions:** This study found that in addition to socioeconomic determinants, self-perceived health is a factor that influences the lifestyles of this population.

## Keywords

aging, lifestyle, socioeconomic factors, elderly

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## Introduction

Healthy aging is defined as the process of developing and maintaining functional capacity that promotes well-being in old age. It is an important indicator that shows a considerable improvement in health care that allows the population to live longer.<sup>1</sup>

Today, most people live to old age, so an increasingly large proportion of the population will be elderly. According to World Health Organization,<sup>2</sup> between 2020 and 2030, the percentage of the planet's inhabitants over 60 years will increase by 34%. By 2050, an estimated 434 million elderly worldwide, 80%, will live in low- and middle-income countries.

Although Latin America and the Caribbean are not yet considered an aging region. Since adults over 60 years of age represent 11% of its population (like 12% of the world population and much lower than the values observed in Europe, North America, East Asia, and Oceania with 24%, 21%, 17%, and 16%, respectively), it is the region that ages more rapidly, at an unprecedented rate.<sup>3,4</sup>

For example, in Colombia, the aging index has gone from 16.6% in 1985 to 58.6% in 2018. Demonstrating the continuous increase in the number of people aged 60 years and over.<sup>5</sup> Today, it is expected to live about 76.7 years.<sup>6</sup> This is a significant figure compared to the time of the 50's when life expectancy was just 52 years. Although this substantial increase in life expectancy is an outstanding achievement, it also brings significant challenges, especially ensuring good health and well-being conditions for a growing number of people over 70 years, with a possibly increasing demand for services and its level of dependency.

<sup>1</sup>Fundación Universitaria María Cano sede Popayán, Colombia

<sup>2</sup>Fundación Universitaria María Cano sede Neiva, Colombia

<sup>3</sup>Universidad Surcolombiana, Neiva, Colombia

### Corresponding Author:

Piedad Rocío Lerma Castaño, Fundación Universitaria María Cano sede Neiva, Calle 21 8 B-15 Barrio Tenerife, Neiva Huila 410010, Colombia.  
Emails: piedadrociolermacastano@fumc.edu.co; pirlcast28@gmail.com



Several studies report that lifestyle has significant effects on the physical and mental health and quality of life of the human being and is reflected in adulthood.<sup>7</sup> Physical exercise interventions promote global cognition and cognitive flexibility benefits in older adults with frailty syndrome.<sup>8</sup> However, many of them experience a sedentary life, inadequate nutrition, little emotional support, and little self-realization.

On the other hand, poor eating habits, insufficient physical activity, and smoking late in life are the main risk factors for death worldwide and a key risk factor for non-communicable diseases such as cardiovascular disease and type II diabetes in people 65 years old or older.<sup>9</sup>

Additional, Ng et al<sup>10</sup> reports that following a healthy diet, performing regular physical activity, avoiding cigarettes, and moderately ingesting alcohol are factors that reduce total population mortality, including that caused by cardiovascular diseases, suggesting that adherence to a Mediterranean diet and a healthy lifestyle in people ages 70 to 90 is associated with a more than 50% lower all-cause and cause-specific mortality rate.

Although the fact that a healthy lifestyle can make a big difference between 2 people who are exposed to the same risk level. Likewise, individual health can also be affected by structural factors such as the primary producers of social stratification or disintegration as well as the intermediate elements, such as the material conditions of life.<sup>11</sup>

Many people enter the third age having a working career of more than 30 or 40 years, with a non-negligible cumulative impact of various exposures throughout the working life. However, working conditions can affect health differently from one individual to another.<sup>12</sup> These so-called “structural” determinants reflect a relatively stable form of society. Various studies indicate that health levels decrease with socioeconomic characteristics such as age, educational background, and social inequity.<sup>12,13</sup>

The study on Socioeconomic inequality in non-communicable diseases in Europe<sup>14</sup> presents interesting findings that non-communicable diseases (NCD) are unequally distributed to the detriment of poor people and that this inequality may be related to differences in education and wealth rather than income. For your side, Nguyen et al<sup>15</sup> revealed that being female, older, living alone, and having a chronic disease were negatively associated with QOL, while higher education was positively associated with QOL.

Studies in Colombia with the elderly population have reported somewhat divergent results<sup>16-18</sup> presents an association between quality of life and structural SSD: predominating the self-perception about their economic position and educational level that is associated with a good quality of life, while Toro et al<sup>19</sup> present a positive relationship between belonging to the subsidized social security system, being a woman, and being long-lived with a poor quality of

life and He did not find a relationship between quality of life and socioeconomic, nor with educational level.

Numerous studies report higher morbidity and mortality rates due to NCDs are more frequent in populations with low socioeconomic status. However, studies that analyze their relationship with unhealthy lifestyles only partially explain this relationship. It is possible that such a relationship has been examined in a limited way, mainly because “lifestyle” implies the possibility of “choice and control over health behaviors,” and in less favored populations (low income, poverty, low educational level, among others) such control cannot be exercised.<sup>20</sup> However, few studies are found that examine the relationships between lifestyle, SES, and adverse health outcomes from the perspective of interactions between lifestyle factors and SES.<sup>21</sup>

According to the above, there seems to be ample evidence, especially for developing countries, about the influence of socioeconomic characteristics and people’s health status.<sup>20</sup> In general, not many studies show the influence of socioeconomic determinants on the lifestyles of older adults in countries like Colombia, with high levels of inequity and inequality in health, which was sought to be addressed in this study.

Therefore, the study’s main objective was to establish the relationship between socioeconomic factors and the healthy lifestyles of the elderly.

## Methods

The research was developed from a descriptive quantitative approach with analytical intent, with a non-experimental, cross-sectional design.

**Participants:** Universe: Older adults in the city of Colombia. Population: Members of the older adult groups organized and registered in the municipal health secretariat as of December 2016. Sample: The sample was estimated considering a population of 33 117 people for the DANE-Population projections 2005 to 2020 by age groups. The sample size is determined at 377 people. The sample finally consisted of 407 older adults. The calculation was determined using the freely distributed program EPIDAT 4.0. With a 95% CI, an error of 5%, and an expected proportion of 50%.

**Sampling:** A purposive sampling that included older adults in the urban area was conducted.

Criteria for inclusion in the study were the following: (1) being over 60 years of age, (2) having the ability to answer the questions of the sociodemographic questionnaire, the Fantastic test: the ability to concentrate, attention, and verbal and written communication. This criterion was established through the evaluation of higher mental functions by means of the Mini-mental test,<sup>22</sup> (3) to accept participation in the study by signing the informed consent form.

Exclusion criteria were established as follows: (1) being in nursing homes, (2) being under psychiatric treatment, (3) not having a good health and functional condition that would allow participation in the study.

**Instruments:** A survey designed by the research group was applied with questions of sociodemographic and socioeconomic information.

In sociodemographic variables included: Age (60-70 years; 71-80 years; 81-90 years and 91-100 years); Social stratum (0, 1 (Low-Low), 2 (Low), 3 (Medium-Low), 4 (Medium), 5 (Medium-High). Occupation (Employee, Pensioner, Work at home, Informal work, Unemployed), Educational level (None; Preschool; Basic elementary; Basic high school; Half Educational; Titled technician; Technological and professional).

In the socioeconomic aspects, the information on the perception of the financial situation, declaration of economic dependence (Financially independent or Economically dependent), Level of income (Your average household income is), level of income (in minimum wages current laws <1 to >4), number of people living with him (in ranges from 1 to 15 people), Housing tenure (Own, fully paid; Own, in payment plan; For lease or sublease; With permission of the owner; without any payment -usufructuary).

Food safety is approached from the possibility of accessing a balanced diet (Consumption of a balanced diet) with the following answer options: Almost never, Rarely, Sometimes, Very frequent, Almost Always.

To assess lifestyle, the “FANTÁSTICO” questionnaire was applied in the Spanish version, a generic instrument developed by Wilson and Ciliska<sup>23</sup> from the Department of Family Medicine at McMaster University in Canada. It was built to identify and measure a specific population’s lifestyle by the Department of Family Medicine at McMaster University in Canada. It was made to identify and measure the lifestyle of a given population.

The acronym FANTASTIC represents the first letters of 10 physical, psychological, and social domains related to Family and friends, Physical Activity, Nutrition and Food, Tobacco, Alcohol, Sleep and stress, Work and personality, Insight, Health control, sexuality and other behaviors), in which 30 questions are distributed with 3 response options with a numerical value from 0 to 2 for each category, and are rated using a Likert-type scale (0: hardly ever; 1: sometimes; 2: Always)<sup>24</sup> Table 1.<sup>24</sup>

Once the questionnaire is completed, the final score is multiplied by 2, obtaining a final range of scores from 0 to 120 and classified into the following categories that will determine the lifestyle the person evaluated:

0 to 46: You are in a danger zone.

47 to 72: Somewhat low. You could improve.

73 to 84: Adequate, you’re fine.

85 to 102: Good job, you are on the right track

103 to 120: Congratulations, you have a **Fantastic** lifestyle.

This questionnaire has been validated in Colombian adults, presenting good internal consistency with a Cronbach’s  $\infty$  more significant than .67. It has been used in primary health care and epidemiological studies to assess the lifestyle of older people.<sup>25</sup>

### Statistical Analysis

Was performed using univariate descriptive methods such: as measures of central tendency and dispersion; and the bivariate methods such: as contingency tables. In the contingency tables, we studied whether there are associations between the variables using the Chi-square test. The variables that were statistically significant in the bivariate were included in the ordinal logistic regression models, employing the introduced method, taking as dependent variables lifestyle with 4 categories (excellent, very good, good, regular) and emotional condition, represented for the variable “I feel sad or depressed” with 5 categories (almost never, rarely, sometimes, quite often, and almost always). An alpha level of .05 was adopted for all the tests, and the statistical analyses were performed using the SPSS version 28.

**Ethical considerations:** Written informed consent was obtained from the study participants, respecting the ethical principles of the declaration of Helsinki<sup>26</sup> y la Resolución No. 8430 of 1993 of the Ministry of Health of Colombia for research in health sciences classified in the category research “without risk” according to article 11.<sup>27</sup> This study was approved by the Research Committee (Minutes 1-14) and the Ethics Committee of the Fundación Universitaria María Cano (code 01300706B-2014-311). Before being included, the participants were informed about the research, and an explanation was provided on the evaluation of the state and perception of health and healthy lifestyles.

### Results

The sample consisted of 407 older adults with an average age of 70.31 years ( $\pm 10$ ). Primarily women (73.5%), with single marital status (60.2%), concerning socioeconomic status, the majority (76%) of the participants were located in: I (low-low) and II (low), the (45.2%) said they did housework, (21.6%) informal and 21.4% reported being unemployed. Older adults between 60 and 70 years old reported their lifestyles excellent and very good. In contrast, the rating of regular increases in older adults with ages of the following 2 decades, with an average of 23.2%.

Furthermore, to establish the relationship between the levels of perception of lifestyle and the sociodemographic,

**Table 1.** “FANTÁSTICO” Questionnaire Test.

Category or domain	Lifestyle evaluation items	Response
Family and Friends	- I have someone to talk to about the things that are important to me	0: Hardly ever
	- I give and receive love	1: Sometimes
	- I find it hard to say good morning, excuse me, thank you, or I'm sorry	2: Always
Physical activity, associativity	- I am an active member of health or social support groups.	0: Hardly ever
	- I do physical activity for 30 min	1: Sometimes
	- I walk at least 30 min daily	2: Always
Nutrition and food	- I eat 2 servings of fruit and three servings of vegetables.	0: Hardly ever
	- I often eat a lot of sugar, salt, junk food, or fat	1: Sometimes
	- I am over my ideal weight	2: Always
Tobacco	- I smoke cigarettes	0: Hardly ever
	- How many cigarettes do you usually smoke per day?	1: Sometimes
	- Excessive use of medications without a medical prescription or I self-medicate	2: Always
Alcohol	- Average number of drinks per week.	0: Hardly ever
	- I drink more than 4 drinks on the same occasion	1: Sometimes
	- I drive the car after drinking alcohol.	2: Always
Sleep and stress	- I sleep well and feel rested	0: Hardly ever
	- I feel able to handle stress or tension in my life	1: Sometimes
	- I relax and enjoy my free time	2: Always
Work and personality	- I seem to be running fast.	0: Hardly ever
	- I feel angry or aggressive	1: Sometimes
	- I feel happy with my job or my activities	2: Always
Introspection	- I am a positive and optimistic thinker	0: Hardly ever
	- I feel tense or tight	1: Sometimes
	- I feel depressed or sad.	2: Always
Health control, sexuality	- I have regular health checks	0: Hardly ever
	- I discuss with my partner or family aspects of sexuality	1: Sometimes
	- In my sexual behavior, I worry about self-care and the care of my partner	2: Always
Other behaviors	- As a pedestrian, or passenger of public transport, I follow the rules	0: Hardly ever
	- I use seat belt	1: Sometimes
	- I have a clear goal in life	2: Always

Source: Villaret al<sup>24</sup>

economic, and self-perceived variables of health status, a comparison was carried out using the  $\chi^2$  test. It shows significant differences with the variables age, socioeconomic status, occupation, educational level, perception of health status and economic situation, type of housing, number of people who make up the household, and the average income received. The data in detail are observed in the Supplemental Material (Supplemental Tables 1, 2, and 3). Subsequently, an ordinal logistic regression analysis design was applied in which the dependent variable lifestyle measured with the fantastic test included 4 categories (excellent, very good, good, fair). As independent variables, those stated compared to the  $\chi^2$  statistic were included. An analysis of the regression modeler obtained a Nagelkerke  $R^2$  of .362. Therefore, the model could explain 36% of the relationship between sociodemographic and economic factors. During the analysis, in introducing each variable, the factors that lost statistical significance did not fit with the model or contributed little to the  $R^2$  were excluded, seeking

a parsimonious adjustment. Finally, Table 1 presents the model corresponding to lifestyle explained mainly by the variables: number of people living in the household ( $\beta = -.182$ ), age ( $\beta = .027$ ), and average economic income ( $\beta = 1.461$ ); Table 2.

The relationship between the levels of perception of the emotional condition with the sociodemographic, economic, and self-perceived variables of health status was also initially analyzed with the  $\chi^2$  statistic. It shows significant differences in age, socioeconomic status, occupation, educational level, average income, perception of health status, and economic situation; detailed data can be seen in the Supplemental Material (Supplemental Tables 2 and 3). The ordinal logistic regression for the emotional condition, represented by the variable “I feel sad or depressed,” measured with the fantastic test, included 5 categories (almost never, rarely, sometimes, quite often, and almost always). Also, a model with a Nagelkerke  $R^2$  of .33 was obtained. It explains 33% of the relationship

**Table 2.** Relationship Between the Perception of Lifestyle Sociodemographic and Economic Variables and Self-Perceived Health Status.

Parameter estimates					CI 95%	
Threshold	Estimate	Dev. mistake	Wald	Next.	Inferior limit	Higher limit
[Fantastico = 1]	1.892	0.991	3.647	0.056	-0.05	3.834
[Fantastico = 2]	3.071	0.996	9.51	0.002	1.119	5.022
[Fantastico = 3]	5.874	1.036	32.152	<0.001	3.843	7.904
Location						
No. of people living in the home	-0.182	0.044	17.502	<0.001	-0.268	-0.097
Age	0.027	0.014	3.987	0.046	0.001	0.054
Average household income	1.461	0.144	102.81	<0.001	1.179	1.744
Log-Likelihood = 733.081						
Test that all slopes are zero	Chi-square	DF	P-value			
	166.174	3	<0.001			
Goodness-of-fit tests						
Pearson	739.323	789	0.896			
Deviance	609.538	789	1			
Parallel lines test	3.87	6	0.694			

Source: Own.

between sociodemographic, economic, and self-perception factors with the condition of emotional health. Likewise, only the significant coefficients that fit the model presented in Table 2 were included, made up of age ( $\beta = -0.044$ ), average household income ( $\beta = -1.282$ ), and perceived health status ( $\beta = -0.567$ )—Table 3.

## Discussion

The present study establishes the relationship between socioeconomic determinants with healthy lifestyles of the elderly population.

The results showed that most older adults between 60 and 70 years old reported having an excellent and very good lifestyle according to the categorization of the Fantastic questionnaire. Similarly, Deluga et al<sup>28</sup> found an “excellent” lifestyle with healthy habits in a sample of 138 older adults from rural and urban areas (45.7%) or “very good” (41.3%) lifestyle healthy habits. Therefore, the lifestyle of older people is determined by several factors, including age, gender, health status, level of education, and place of residence.

Differences were found in the relationship between lifestyles and the variables age, socioeconomic status, occupation, educational level, perception of health status and economic situation, type of housing, number of people who make up the household, and the average income received. Significant, as reported by Asadi Brojeni et al<sup>29</sup> who found that the lifestyle of the elderly was significantly associated with gender, education, income level, marital status, living arrangement, state of housing, and age ( $P < .001$ ).

Another study carried out in Iran also reported significant differences between the lifestyle of the elderly in terms of marital status, cohabitation status, and economic and educational level ( $P \leq .05$ ),<sup>30</sup> therefore, the elderly who are married live in single-family homes, live in a nuclear family, have their own home, a stable economic situation, and a good diet are considered positive factors for healthy aging.<sup>31</sup>

Different studies<sup>32-34</sup> similarly conclude that the lifestyle of older adults is significantly associated with sociodemographic variables such as gender, age, education, income level, type of housing, and housing situation.

Additionally, a relationship was found between the perception of the emotional condition with the sociodemographic-economic variables and self-perception of the state of health. Similar findings are reported by Sahinoz and Sahinoz<sup>31</sup> in a study in which 472 older adults participated, stating that 82.4% of the older adults were satisfied with their lives, and their health was evaluated as “very good” (10.9%), good (36.6%), 39.1% medium, and 13.4% poor. Likewise, a statistically significant difference was found between the satisfaction with life of the elderly according to their self-assessed health status ( $P = .0001$ ). However, the economic factor can have a negative impact on multimorbidity in older adults.<sup>35</sup>

The study also showed that the elderly belonging to low socioeconomic strata (with lower income) perceived their lifestyles as excellent. While higher strata (including pensioners) reported perceiving a regular lifestyle. When comparing the elderly stratum with the lifestyle significant differences were found ( $P = .000$ ). Contrary to this finding, Bell et al<sup>36</sup> report that elderly with previous savings, asset

**Table 3.** Relationship Between Perception of Emotional Condition with Sociodemographic and Economic Variables and Self-Perception of Health Status.

Parameter estimates					CI 95%	
Threshold	Estimates	Desv. error	Wald	Next.	Inferior limit	Superior limit
[Me siento triste o deprimido = 1]	-9.955	1.068	86.904	<.001	-12.048	-7.862
[Me siento triste o deprimido = 2]	-8.932	1.043	73.401	<.001	-10.976	-6.889
[Me siento triste o deprimido = 3]	-7.132	1.005	50.308	<.001	-9.102	-5.161
[Me siento triste o deprimido = 4]	-5.734	0.985	33.913	<.001	-7.664	-3.804
Location						
Age	-0.044	0.013	11.056	<.001	-0.069	-0.018
Average household income	-1.282	0.129	99.245	<.001	-1.534	-1.029
Perception of health status	-0.567	0.125	20.434	<0.001	-0.812	-0.321
Log-likelihood = 744.376						
Test that all slopes are zero	Chi-square	DF	P-value			
151.686	3	<.001				
Goodness-of-fit tests						
Pearson	873.137	7.29	<.001			
Deviance	577.321	7.29	1			
Parallel lines test	14.658	9	.101			

Source: Own.

allocation, and insurance decisions have better subjective longevity (Irish case), which they attribute to cultural differences that influence their lifestyle.

**Limitations:** Assuming that the instruments applied to correspond to self-report data for the elderly (although taken personally by the research team), a limitation is recognized in the difficulty of being independently verified. New studies could consider including questions for families, which later allow information to be triangulated. Finally, these findings turn out to be useful for health professionals and researchers for decision-making in public health policies applied to the elderly.

## Conclusion

This study found that in addition to socioeconomic determinants, the self-perceived health status and lifestyle of the elderly have a significant relationship with their emotional state (the feeling of sadness or depression).

On the other hand, the lifestyle of older adults seem to depend on the attitude with which they face their situation or socioeconomic condition, which would explain that even in difficult socioeconomic conditions, older adults enjoy their limited resources.

It is suggested that health promotion programs aimed at stimulating healthy lifestyles also consider strategies to encourage the participation of older adults from high strata. Therefore, more research is needed on this population group.

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## ORCID iDs

Elizabeth Roldán González  <https://orcid.org/0000-0002-2307-9351>

Piedad Rocio Lerma Castaño  <https://orcid.org/0000-0002-9546-8436>

## Supplemental Material

Supplemental material for this article is available online.

## References

1. World Health Organization. Ageing and health. 2021. Accessed June 12, 2022. <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>
2. World Health Organization. Decade of healthy ageing: plan of action 2020-2030. 2021. Accessed June 12, 2022. <https://www.who.int/publications/m/item/decade-of-healthy-ageing-plan-of-action>

3. Arango N, Stampini M, Ibararán P, Medellín N. Panorama of aging and dependency in Latin America and the Caribbean. Iberoamerican Development Bank. 2018. Accessed June 12, 2022. <https://publications.iadb.org/publications/spanish/document/Panorama-de-envejecimiento-y-dependencia-en-America-Latina-y-el-Caribe.pdf>
4. United Nations. World population prospects 2019: methodology of the United Nations population estimates and projections. 2019. Accessed June 12, 2022. <https://www.cepal.org/es/publicaciones/45989-perspectivas-la-poblacion-mundial-2019-metodologia-naciones-unidas-estimaciones>
5. Ministry of Health. Colombian policy on human aging and old ageing 2015-2024. 2015. Accessed June 12, 2022. <https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/DE/PS/Pol%C3%ADtica-colombiana-envejecimiento-humano-vejez-2015-2024.pdf>
6. Latorre C. The aging of the population. Opportunities and challenges. *Revista Ciencias de la Salud*. 2019;17(3):6-8.
7. Raggi A, Corso B, Minicuci N, et al. Determinants of quality of life in ageing populations: results from a cross-sectional study in Finland, Poland, and Spain. *PLoS One*. 2016;11(7):e0159293. doi:10.1371/journal.pone.0159293
8. Rossi PG, Carnavale BF, Farche ACS, Ansai JH, de Andrade LP, Takahashi ACM. Effects of physical exercise on the cognition of older adults with frailty syndrome: a systematic review and meta-analysis of randomized trials. *Arch Gerontol Geriatr*. 2021;93:104322. doi:10.1016/j.archger.2020.104322
9. Troutman-Jordan M, O'Brien T, Blair C, Pena T. Physical activity, cardiovascular health and mood state in older adults. *Geriatr Nurs*. 2020;41(6):846-851. doi:10.1016/j.gerinurse.2020.05.010
10. Ng TP, Zhong X, Gao Q, Gwee X, Chua DQL, Larbi A. Socio-environmental, lifestyle, behavioural, and psychological determinants of biological ageing: the Singapore longitudinal ageing study. *Gerontology*. 2020;66(6):603-613. doi:10.1159/000511211
11. De la Guardia MA, Ruvalcaba JC. Health and its determinants, health promotion and health education. *J Negat No Posit Results*. 2020;5(1):81-90. doi:10.19230/10.19230/jon-npr.3215
12. International Labour Organization. Safety and health at the heart of the future of work: Building on 100 years of experience. 2019. Accessed June 12, 2022. [https://www.ilo.org/wcmsp5/groups/public/@ed\\_protect/@protrav/@safework/documents/publication/wcms\\_678357.pdf](https://www.ilo.org/wcmsp5/groups/public/@ed_protect/@protrav/@safework/documents/publication/wcms_678357.pdf)
13. Pan American Health Organization. *Health in the Americas+, 2017 Edition. Summary: Regional Outlook and Country Profiles*. PAHO; 2017. Accessed June 12, 2022. <https://www.paho.org/salud-en-las-americas-2017/wp-content/uploads/2017/09/Print-Version-English.pdf>
14. Bono F, Matranga D. Socioeconomic inequality in non-communicable diseases in Europe between 2004 and 2015: evidence from the SHARE survey. *Eur J Public Health*. 2019;29(1):105-110. doi:10.1093/eurpub/cky165
15. Nguyen TT, Le NB, Vu LH, Le AV. Quality of life and its association among older people in rural Vietnam. *Qual Quant*. 2019;53(1):131-141. doi:10.1007/s11135-018-0739-0
16. Roldan E, Rosas LA, Rosas GA, et al. Sedentary lifestyle and physical condition in the elderly who attend life centers in Popayán, Cauca. In: Gómez E, Ordóñez CA, Calvo AP (eds) *Healthy Community and Workplace Environments. Disease*, 1st ed. Universidad Libre de Cali; 2020;237-258.
17. García JA, Vélez C. Social determinants of health and quality of life of the adult population of Manizales, Colombia. *Rev cuba salud pública*. 2017;43(2):191-203.
18. Gómez F, Osorio-García D, Panesso L, Curcio CL. Healthy aging determinants and disability among older adults: SABE Colombia. *Rev Panam Salud Publica*. 2021;45:e98. doi:10.26633/RPSP.2021.98
19. Toro SG, Hernández KÁ, Uribe SC, Silva JPC, Gaviria DL, Pérez-Orozco DJ. Association between quality of life related to health and sociodemographical and anthropometric factors in a Colombian health institution. *Revista Salud Bosque*. 2020;10(1):42-51. doi:10.18270/rsb.v10i1.2785
20. Foster H, Polz P, Mair F, Gill J, O'Donnell CA. Understanding the influence of socioeconomic status on the association between combinations of lifestyle factors and adverse health outcomes: a systematic review protocol. *BMJ Open*. 2021;11(5):e042212. doi:10.1136/bmjopen-2020-042212
21. Eguchi E, Iso H, Honjo K, Yatsuya H, Tamakoshi A. No modifying effect of education level on the association between lifestyle behaviors and cardiovascular mortality: the Japan collaborative cohort study. *Sci Rep*. 2017;7:39820. doi:10.1038/srep39820
22. Lobo A, Saz P, Marcos G, et al. [Revalidation and standardization of the cognition mini-exam (first Spanish version of the mini-mental status examination) in the general geriatric population]. *Med Clin*. 1999;112:767-774.
23. Wilson DMC. The FANTASTIC lifestyle checklist: design and application. *Recreation Research Review*. 1984;11(2):17-21.
24. Villar M, Ballinas Y, Gutiérrez C, Angulo Y. Reliability analysis of the fantastic lifestyle checklist in workers evaluated by the program: "reforma de vida" from the peruvian social health insurance (ESSALUD). *Rev peru med integr*. 2016;1) 2:17-26.
25. Ramírez-Vélez R, Agredo RA. [The Fantastic instrument's validity and reliability for measuring Colombian adults' lifestyle]. *Rev Salud Pública (Bogotá)*. 2012;14(2):226-237. doi:10.1590/S0124-00642012000200004
26. World Medical Association. WMA Declaration of Helsinki – Ethical principles for medical research involving human subjects. 2017. Accessed June 12, 2022. <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/>
27. Ministry of Health. Resolution 8430. 1993. Accessed June 12, 2022. <https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/DE/DIJ/RESOLUCION-8430-DE-1993.PDF>
28. Deluga A, Kosicka B, Dobrowolska B, et al. Lifestyle of the elderly living in rural and urban areas measured by the FANTASTIC life inventory. *Ann Agric Environ Med*. 2018;25(3):562-567. doi:10.26444/aaem/86459
29. Asadi Brojeni S, Ilali ES, Taraghi Z, Mousavinasab N. Lifestyle and its related factors in elderly. *J Nurs Midwifery Sci*. 2019;6(1):32-37. doi:10.4103/JNMS.JNMS\_39\_18
30. Alaei N, Jafari R, heravi-Karmooi M, Arsang S. Investigation of lifestyle and its related factors in the elderly population in Qom City, 2017 (Iran). *Qom Univ Med Sci J*. 2018;12(8):69-77. doi:10.29252/qums.12.8.69

31. Sahinoz T, Sahinoz S. Investigation of healthy living strategies in elderly who achieved to live long and healthy. *Pak J Med Sci.* 2020;36(3):371-375. doi:10.12669/pjms.36.3.1838
32. Barzegar N, Niknami M, Mirhadian L, Kazem Nejad Leili E, Pakseresht S, M.Meghachandra Singh M. Lifestyle and factors associated with the elderly people referred to the Pension Fund. *J Holist Nurs Midwifery.* 2017;27:1-8. doi:10.18869/acadpub.hnmj.27.2.1
33. Neri AL, Borim FSA, Fontes AP, et al. Factors associated with perceived quality of life in older adults: ELSI-Brazil. *Rev Saúde Pública.* 2018;52(Suppl 2):16s. doi:10.11606/S1518-8787.2018052000613
34. Baron M, Riva M, Fletcher C. The social determinants of healthy ageing in the Canadian Arctic. *Int J Circumpolar Health.* 2019;78(1):1630234. doi:10.1080/22423982.2019.1630234
35. La Foucade A, Davis G, Baboolal N, et al. The socioeconomic determinants of multimorbidity among the elderly population in Trinidad and Tobago. *PLoS One.* 2020;15(9):e0237307. doi:10.1371/journal.pone.0237307
36. Bell DN, Comerford DA, Douglas E. How do subjective life expectancies compare with mortality tables? Similarities and differences in three national samples. *J Econ Ageing.* 2020;16(C):100241. doi:10.1016/j.jeoa.2020.100241