

There is no association between anxiety and lifestyle in older adults during the COVID-19 pandemic: A cross-sectional study

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Abstract

Introduction and objective: The COVID-19 pandemic has caused mental health problems worldwide. Older people have been particularly affected by the lockdown as their health conditions have changed, although they have been kept in isolation to avoid exposure to contagion. We sought to determine the association between lifestyles and anxiety in older adults during the COVID-19 pandemic.

Materials and methods: This study was cross-sectional. We enrolled 150 older adults of both sexes and with a history of chronic diseases from the municipality of El Agustino (Lima, Peru). The 20-item Geriatric Anxiety Scale and the 25-item Lifestyle Questionnaire on eating, physical activity, rest, and sleep were administered in Spanish during July–August 2021.

Results: The mean age was 70.8 ± 8.1 years, 54.7% were male, and 75.3% practiced exercise. During the COVID-19 pandemic, 99.3% of the elderly had healthy lifestyles and 40% presented anxiety (mild, moderate, and severe anxiety in 26.7%, 8.7%, and 4.7%, respectively). We found no association between anxiety and lifestyle ($p = 0.189$), physical exercise was a predictor of lifestyle ($p < 0.001$) and we did not find predictors of anxiety symptoms ($p > 0.05$).

Conclusions: Our results suggest that there was no link between anxiety symptoms and lifestyle in older adults during the lockdown. It is important to conduct in-depth research on factors associated with anxiety symptoms among older residents in other regions, focusing on population groups with the highest rates of infection and death from COVID-19.

Keywords

Anxiety, COVID-19, lifestyle, older people, physical activity, Peru

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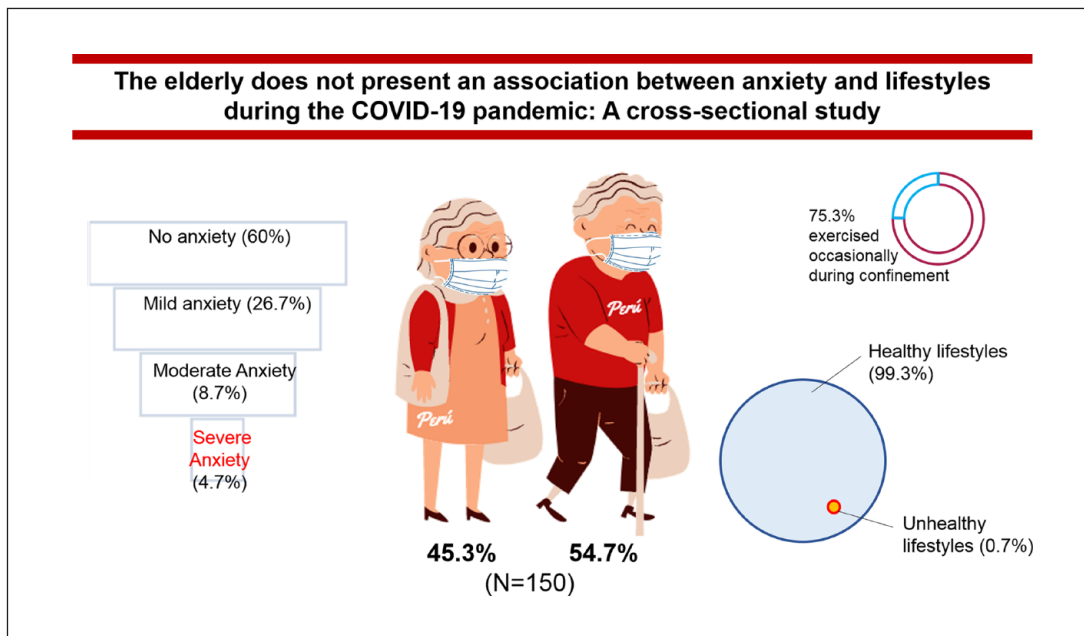
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Graphical abstract



Introduction

Lifestyle is an individual's habits and behaviors, which depend on many factors, including social conditions and cultural background, and are factors directly related to health. Research shows that a positive change in lifestyle, such as avoiding excessive alcohol or tobacco consumption, eating a healthy diet, and regular physical activity, can not only improve health but also reduce the onset and development of diseases.¹ For this reason, a good lifestyle contributes to the harmony between basic functional, health, and environmental processes for collective integration and interrelationships in society.

The older adult population undergoes a process of physiological changes due to aging, generating their fragility. This triggers vulnerability to various burdensome factors and is aggravated by the manifestation of comorbidities that affect vital functions, thus decreasing their degree of independence and making them require support to have a better quality of life.² In the world report on aging and health provided by the World Health Organization in 2015, it is mentioned that in Europe the prevalence of frailty in adults between 50 and 64 years of age was 4.1% and increases to 17% from 65 years. Furthermore, it is assumed that frailty is more prevalent in low- and middle-income countries, with higher incidence in women and people with low socioeconomic status.³

The well-being of the elderly is significantly affected by numerous diseases and health conditions, particularly chronic ones such as stroke, cancer, and liver disease, which pose considerable challenges and lead to substantial health expenditures for individuals and their families.⁴ Maintaining

optimal physical health is crucial, with issues such as obesity linked to reduced physical functioning, lower energy levels, and a decline in vitality.⁵ Mental well-being is equally critical, with depression and decreased self-esteem prevalent among obese elderly women, negatively impacting their overall health.⁶ The psycho-social status of the elderly is pivotal, as evidenced by an Indian study highlighting a significant association between psycho-social changes and health status, emphasizing the need for gerontological social work services to support graceful aging and a sense of well-being.⁷

Elderly people suffering from severe illness or functional limitations tend to suffer from mental health or emotional problems, such as depression and anxiety.⁸ Anxiety is a defense mechanism in the face of dangerous situations that manifests itself emotionally with intense feelings of worry and even physiological changes. Anxiety is frequent in older adults affecting 7.3% as a generalized anxiety disorder⁹ with an increasing prevalence from 11.2% in 2013 to 14.2% in 2019.¹⁰ These figures are worrisome, not least because they are at the end of their life cycle and they may experience death anxiety. This is a trigger that leads to physical deterioration and a predisposition to depressive symptoms and worse behaviors that can lead to suicide.¹¹

In this regard, the rapid spread of the COVID-19 pandemic has produced worldwide fear not only because of the possibility of infection but also because of uncertainty about its duration and long-term consequences.¹² This has given way to mental problems in the general population, being more noticeable in older adults, as they are negatively affected by isolation, manifesting 37% levels of anxiety and depression.¹³

Similarly, in a Korean older adult population, it was found that anxiety symptoms had a prevalence of 38.1%.¹⁴

Undoubtedly, the news linked to COVID-19 has affected the lifestyles of the elderly worldwide especially because they had the highest mortality rate due to the contagion, which made them more vulnerable to stress.¹² These changes were reflected in the different phases of the pandemic, for example during the first phase, the Finnish elderly population was more susceptible to negative changes, especially if they lived alone. This is because, even though their dietary habits remained stable or improved, physical activity decreased by 34%.¹⁵ In a sample of older adults at risk of dementia, it was found that more than a third of the participants reduced their physical activity and almost 70% increased their inactivity time. Notably, 19.8% were depressed and 9.5% anxious, making these changes highly detrimental to cognitive decline.¹⁶

This was also reflected in Peru since the populations most affected by anxiety and depression related to social isolation were pregnant women, at-risk populations, and older adults.¹⁷ In addition, in frail older adults between 80 and 97 years of age, 60.9% had major anxiety and 35.9% had minor anxiety.¹⁸ Considering that these studies have not associated mental health problems in the elderly confined during COVID-19, it is important to characterize which factors influence lifestyles and to what extent these can be modifiable to improve the well-being of this vulnerable group.

We aimed to determine the association between lifestyles and anxiety symptoms in elderly Peruvians during the second wave of COVID-19. The study hypotheses included (a) that poor lifestyles can lead to the development of anxiety and (b) that the most frequent anxiety symptoms are mild. Given that no study in Peru, to the best of our knowledge, has examined such a relationship between these concepts, it is key to know the mental health issues in the elderly during the pandemic.

Methods

Study design, settings, and definition

This cross-sectional study followed the guidelines of the STROBE guideline.¹⁹ This study was conducted in the municipality of El Agustino (Lima) in 2021. According to data from the National Institute of Statistics and Informatics (Instituto Nacional de Estadística e Informática) (INEI) in the 2017 National Population and Housing Census, its population was 198,862 inhabitants of which 134,332 had health insurance and of the total census population, 21,829 were aged 60 years and older. On the other hand, by 2018, 10,865 people aged 60 and over were insured by Comprehensive Health Insurance; and in 2019, they had 110 health facilities where 13,038 people aged 60 and over attended. Likewise, up to August of this last year, 825 users of the Pension 65 program were registered.²⁰

A healthful lifestyle among older individuals is defined as a set of behaviors, choices, and habits aimed at preserving

and enhancing physical, mental, and social well-being during the later stages of life. This comprehensive approach to lifestyle assessment includes key elements such as maintaining a nutritious diet, promoting oral health, engaging in mental stimulation, fostering social relationships, effectively managing stress, ensuring adequate sleep, and participating in routine physical activity.²¹

Population, inclusion criteria, and instruments

The sample size was determined utilizing the formula for a known population, factoring in a 95% confidence level and a 5% margin of error. A total of 150 elderly individuals were recruited through a simple random sampling technique. The inclusion criteria were voluntary for both sexes, those of Peruvian nationality, and with a history of chronic diseases. Elderly hospitalized for different causes including COVID-19, elderly people with complete disability of movement, cognition, or language were excluded.

The instrument used in this research was the Geriatric Anxiety Scale Spanish version.^{22,23} This anxiety scale aims to measure frequent anxiety symptoms specifically in older adults and consists of 20 items based on three dimensions: cognitive symptoms (11 items), somatic symptoms (4 items), and activation (5 items). The responses are presented on a Likert scale of none (0 points), sometimes (1 point), most of the time (2 points), and all the time (3 points). According to the scores obtained, from 0 to 10 points, they were assessed as having no anxiety, from 11 to 22 points they had mild anxiety symptoms, from 23 to 42 points they had moderate anxiety, and from 43 to 60 points they had severe anxiety.²³

Also, the 25-item Lifestyles Questionnaire on Eating, Physical Activity, Rest, and Sleep, which was published by Aguilar Molina in 2013 ($\alpha=0.950$) and subsequently validated for the Peruvian older adult population by Ventura in 2018 ($\alpha=0.910$), was used. This questionnaire aims to assess the variables involved in a healthy lifestyle with four dimensions (diet, physical activity, rest, and sleep). This questionnaire includes personal data such as age, sex, and degrees of education. The answers are also on a *Likert* scale as 1 (never), 2 (sometimes), 3 (frequently), and 4 (always). Depending on the score, if 25 to 50 points are obtained, the person does not lead a healthy lifestyle and from 51 to 100 points, he/she is healthy.²⁴

Statistical analysis

Data were recommended door-in-door at the housing complex. A physical informed consent was included, and the survey was conducted between July and August 2021. After each survey, the data were collected directly to the data matrix in MS Excel where the data were managed. The data analysis was performed in SPSS v.24.0 (Armonk, NY, USA) statistical analyzer where descriptive statistics were used to determine absolute frequencies, and measures of central tendency (mean, median, and mode) for each scale that will

Table 1. Baseline characteristics of the elderly enrolled in the study. *N* = 150.

Variable	Categories	<i>N</i> (%)
Age group (years)	60–70	82 (55.3)
	71–80	50 (33.3)
	81–90	18 (12)
Sex	Male	82 (54.7)
	Female	68 (45.3)
Education level	Full elementary school	19 (12.7)
	Incomplete elementary school	5 (3.3)
	Full high school	45 (30)
	Incomplete high school	12 (8)
	University	69 (46)
Exercise	Yes	113 (75.3)
	No	37 (24.7)

follow the indications for its assessment. The association between lifestyles and anxiety levels was performed with Pearson's test. Binary linear regression analysis was used to study the predictors of anxiety and lifestyles. For all analyses, we considered a *p*-value threshold of 0.05 and a 95% confidence interval as significant.

Ethical aspects

This study complied with the guidelines of the Helsinki declaration²⁵ and had the authorization of Asociación de Adjudicatarios y propietarios del conjunto Habitacional Palomino (Palomino Housing Association and owners of the Palomino Housing Complex) (ADAYPCHAP) to access its facilities. Also, to comply with the ethical aspects of the study, this project was approved by the Ethics and Research Committee of Norbert Wiener University (Register No. 944-2021).

Results

The age range of the 150 older adults who participated in the study was 60–91 years, with an average of 70.8 ± 8.1 years and the majority were male (54.7%). 75.3% (113/150) of all the elderly performed physical exercise eventually and the degree of education that had the highest prevalence was higher education with 46% (69/150) followed by 30% (45/150) who possessed complete secondary education (Table 1).

The analysis of lifestyles resulted in 99.3% (149/150) of the participants having healthy lifestyles. On the other hand, with respect to anxiety, 60% (90/150) had no anxiety and 26.7% (40/150) had mild anxiety symptoms. We did not find a significant association between anxiety levels and the lifestyles of the older adult patients (*p* = 0.189).

The predictive analysis of lifestyles has shown that only exercise has shown significance (*p* < 0.001). For the anxiety variable, we found that age (*p* = 0.510), gender (*p* = 0.070),

education level (*p* = 0.193), exercise (*p* = 0.211), and lifestyles (*p* = 0.189) were not predictor variables (Table 2).

Discussion

This study evaluated the lifestyles and anxiety levels of more than 100 elderly Peruvians, showing that almost all of the population studied had a healthy lifestyle despite the pandemic situation due to COVID-19. Likewise, low levels of anxiety were found since more than half of them did not present frequent symptoms.

Strengths

The strengths of this study are that, to the best of our knowledge, this is the first Peruvian study to assess anxiety levels and lifestyles during the second outbreak of the COVID-19 pandemic in the elderly. In addition, instruments specifically designed to determine both variables in the elderly population were applied, and the instrument used to evaluate lifestyles was validated in the Peruvian population. The importance of the variables studied in this population should be emphasized since this age group had the highest mortality rate due to infection during the first years of lockdown.¹² Although it is believed that the elderly had less anxiety symptoms during the lockdown because they stayed at home and were less exposed, while the young had to leave home to work, they could be exposed to daily news and changes in their lifestyles that can affect their well-being. In this sense, our findings support this assumption and describe lower anxiety in an environment that maintains a healthy lifestyle.

Main findings

Our findings showed that 99.3% of the elderly had healthy lifestyles despite the COVID-19 pandemic. These results are consistent with a study conducted in a Finnish elderly population where fewer negative lifestyle changes were found during the first wave of the pandemic.¹⁵ Part of this was due to the physical activity of our participants, as only 24.7% of participants did not engage in eventual physical exercise during confinement. This differs from the perception of a group of Japanese elders, 43.8% of whom reported declining physical fitness.²⁶ Similarly, a study in Singapore, where 35.9% of older adults reported reduced physical activity.²⁷

However, we have noted differences with studies conducted prior to the pandemic. In the Peruvian population in 2018, it has been shown that 67.1% of the elderly presented unhealthy lifestyles and 50.6% were dependent.²⁸ Other studies prior to the pandemic have documented the prevalence of unhealthy lifestyles in rural (7602%) and peri-urban populations (48%–63%) of Peru, showing variability depending on the environment.^{29–31} However, within each population group, marked differences may exist based on comorbidities and access to primary care, leading to 54%

Table 2. Regression analysis for factors predictive of anxiety and lifestyle in the elderly during COVID-19.

Variables	Lifestyle			Anxiety		
	β (SD)	CI95%	p-Value	β (SD)	CI 95%	p-Value
Anxiety	-0.062 (0.47)	-0.155 to 0.031	0.189			
Lifestyle				-0.189 (0.142)	-0.467 to 0.093	0.189
Age (year)	0.063 (0.071)	-0.076 to 0.203	0.370	-0.081 (0.123)	-0.323 to 0.161	0.510
Gender	-0.0316 (1.144)	-2.577 to 1.945	0.783	-3.578 (1.962)	-7.455 to 0.298	0.070
Level of education	-0.185 (0.408)	-0.991 to 0.620	0.65	-0.920 (0.703)	-2.309 to 0.469	0.193
Exercise	-4.909 (1.259)	-7.397 to -2.422	* <0.001	-2.860 (2.279)	-1.643 to 7.363	0.211

* $p < 0.05$ (significant).

and 87.5% of the elderly in peri-urban and urban areas, respectively, adopting healthy lifestyles.^{31,32}

During the pandemic, different levels of unhealthy lifestyles have been reported among the elderly. In Lima, the urban population has shown figures ranging from 50.3% to 76% of elderly individuals with unhealthy lifestyles,^{33–35} while in the Peruvian highlands and the Amazon, these figures have ranged from 43.6% to 90.7%, and reached 83%, respectively.^{36–38} This suggests that lifestyles may be influenced by socioeconomic conditions, as evidenced in our cohort of elderly individuals from the ADAYPCHAP, who, by living in a bubble group and sharing habits and activities during the COVID-19 lockdown, have demonstrated healthy patterns.

In other countries, different perspectives on habits that influence an unhealthy lifestyle are seen. In a sample of Cuban elderly, 66.7% were found to have unhealthy lifestyles and were associated with smoking, coffee, alcoholic beverages, and sedentary lifestyles.³⁹ In our study, the codependency factor was also present in some study participants, however, it did not have an impact on their lifestyles. Further studies are required to estimate whether institutionalization and functional dependence of the elderly may impact their lifestyle during the pandemic. Adopting a healthy lifestyle, particularly through consistent exercise, is recognized as a cost-effective strategy for self-care and secondary prevention of chronic diseases.⁴⁰ However, it is crucial to recognize that maintaining a healthy lifestyle and engaging in exercise does not provide absolute immunity against chronic diseases, given the multifaceted influences of genetic predisposition and environmental factors on their development.

The research underscores the benefits of adhering to all five components of a healthy lifestyle, including regular exercise, showing a nearly 50% reduction in the risk of hypertension and diabetes.⁴¹ However, in the context of chronic obstructive pulmonary disease in China, the prevalence of healthy lifestyle habits remains notably low, with only 27.1% engaging in frequent exercise.⁴² This highlights the importance of acknowledging individual variations in health histories and conditions, reinforcing the understanding that while a healthy lifestyle and regular exercise positively impact chronic diseases, the effectiveness may vary based on individual circumstances.

In our study, the codependency factor was also present in 50% of study participants; however, it had no impact on their lifestyles. However, it is crucial to note that we did not assess chronic diseases as an important factor in the lifestyles of the elderly. The impact of various chronic diseases on the healthy lifestyle of older individuals should be duly recognized. Studies indicate that individuals aged 65 and above facing chronic illnesses may encounter challenges in sustaining a healthful lifestyle.⁴³ Common chronic conditions prevalent among the elderly encompass hypertension, diabetes, visual impairment, hyperlipidemia, joint diseases, and obesity.⁴⁰ These health conditions can exert a substantial influence on different facets of a healthful lifestyle, affecting areas such as physical activity, dietary habits, and social interactions.^{44,45} Individuals grappling with chronic illnesses may encounter difficulties in engaging in regular exercise, adhering to a well-balanced diet, and managing social relationships—integral components of a healthy lifestyle.⁴⁶

On the other hand, anxiety levels during the pandemic in the elderly in the study were low, as 60% had no anxiety and 26.7% had mild anxiety. Similar results were observed in Ireland where, unlike adults aged 18–34 years, those aged 65 years and over had common symptoms of generalized anxiety disorder in 20% during the initial phase of the pandemic.⁴⁷ In addition, 46% of our participants had a higher education degree, this is relevant because, in a Turkish population, geriatric anxiety levels were found to be higher in those with higher education,⁴⁸ which does not agree with our results due in part to the social, economic, and political determinants that govern the health of the elderly.

Our results showed better results if we compare them with studies conducted in other countries such as in the Chinese population, where 37.1% of their elderly experienced depression and anxiety,¹³ and even more marked when contrasted with an Italian population, which obtained a mean of 48.20 ± 9.74 only in anxiety symptoms.⁴⁹ Instead, if we review studies prior to the pandemic, we see levels of anxiety similar to what was found in this study, for example, in South Korea a 2-year longitudinal study was conducted in 2015 and found a prevalence of 38.1% of anxiety symptoms.¹⁴ A 2018 systematic review showed that the prevalence of anxiety disorders in older adults ranged from 1.2% to 15%

in community samples and 1% to 28% in clinical samples, varying but still significant.⁵⁰

As we know the COVID-19 pandemic put older adults in a dramatically vulnerable scenario.⁵¹ More than 17,000 elderly people died from COVID-19 in the first 2 years of the pandemic in Peru, including one of the first countries to impose a strict quarantine in the first few months of March 2020 to June 2020.⁵² As a result, older adults were restricted from engaging in physical activity outside their homes. However, for the first half of 2021, the isolation measures were less strict, and vaccination was prioritized in older adults from the age of 60 years so that while the biosecurity measures are met, it is recommended that they perform physical activity in nearby spaces to promote their overall health.⁵³ This openness and reinsertion into the “new normal” during the COVID-19 pandemic may be an important factor in reducing anxiety levels and improving the well-being of the elderly. It is important that future longitudinal research may delve more deeply into the analysis of these changes linked to government-imposed restrictions.

Limitations

The most significant limitation of the study is that it only evaluated elderly people from one municipality in Lima. Just as we have previously seen that there are changes in risk factors for COVID-19 in the rural Andean population,⁵⁴ there may be differences in mental health, lifestyles, and well-being among the elderly in various regions that should be evaluated to understand extensively the changes associated with the pandemic. Another limitation of the study is that we sought to associate lifestyles with anxiety but did not assess other mental health issues such as stress, depression, or fear of COVID-19. This is particularly important given that these factors vary between populations and may trigger sudden disturbances according to epidemiological changes in the pandemic.⁵⁵ We also did not follow up with participants to see if anxiety levels changed according to the timing of the pandemic, increasing age, dependence, previous treatment of anxiety, comorbidities, and general state of health. Other limitations of the study include the small size of some subgroups, which may affect the interpretation of the results. Despite these limitations, the results of this study have demonstrated a lack of association of lifestyle with anxiety levels.

Conclusion

We did not determine an association between anxiety levels and lifestyles in the elderly during the COVID-19 pandemic. We found that the elderly have a healthy lifestyle and low anxiety levels, so they were not significantly affected by the lockdown. This study motivates research on the mental health and lifestyles of the elderly in other settings, highlighting those with higher COVID-19 infection and mortality rates.

Conducting longitudinal studies is crucial to monitor the evolving mental health and anxiety symptoms among elderly populations, especially throughout various phases of the pandemic. This approach will unveil the long-term repercussions and resilience factors pertinent to this demographic. In addition, a deeper exploration of specific lifestyle factors, encompassing dietary habits, social interactions, and sleep patterns, is essential to comprehensively grasp the intricate relationship between lifestyle and mental health in the elderly. Qualitative investigations gathering narratives on lifestyle changes and anxiety contribute rich insights to quantitative findings and intervention studies could evaluate the effectiveness of lifestyle modifications, exploration of coping mechanisms, cross-cultural analyses, and the integration of technology for monitoring mental health outcomes represent pivotal avenues for advancing our understanding.

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Author contributions

Jeel Moya-Salazar, Daysi Y Damian, and Eliane A. Goicochea-Palomino contributed to the conceptualization, design, data acquisition, data analysis, data interpretation, writing of the work, and critical revision of the work. Hans Contreras-Pulache, Betsy Cañari, and Belén Moya-Salazar contributed to data analysis, data interpretation, writing of the work, and critical revision of the work.

Declaration of conflicting interests

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Ethics approval

Ethical approval for this study was obtained from the Ethics and Research Committee of the Norbert Wiener University (Register No. 944-2021).

Informed consent

Written informed consent was obtained from all subjects before the study.

Trial registration

Not applicable.

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Supplemental material

Supplemental material for this article is available online.

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