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Healthy eating and physical activity in older Peruvians post-pandemic

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SUMMARY

Introduction: The COVID-19 pandemic has accentuated health risks for older adults, where sedentary lifestyles and comorbidities such as obesity and hypertension have increased. In this scenario, it is important to analyze how healthy eating and physical activity are related in this vulnerable population.

Objective: To determine the relationship between healthy eating and physical activity in older adults at a senior citizens' club in Lima.

Materials and Methods: A descriptive and correlational study was conducted with 58 participants (67% women) between the ages of 60 and 75, who were overweight or obese and engaged in some form of physical activity. A validated questionnaire was used to assess diet (Likert scale 1–5, Cronbach's alpha = 0.85) and physical activity (KR-20 = 0.87). The data were analyzed using descriptive and inferential statistics, including correlation and nonparametric tests.

Results: Ninety-nine percent of older adults had healthy eating habits, but only 49% achieved adequate levels of physical activity, revealing a gap. Physically active adults had significantly higher percentages of favorable levels of nutritional knowledge (85% vs. 50%), emotional access (71% vs. 38%), and dietary autonomy (82% vs. 42%). The correlations between these dimensions and physical activity were positive and significant; in particular, autonomy showed a moderate correlation (r = 0.41; p = 0.001).

Discussion: The findings of this study show a positive and statistically significant relationship between healthy eating and physical activity in older adults, which is in line with international studies that highlight the coexistence of healthy behaviors in this population.

Conclusion: There is an association between healthy eating, especially when accompanied by autonomy and emotional well-being, and physical activity in older adults.

KEYWORDS

Lifestyle, nutritional knowledge, emotional well-being, dietary autonomy, public health.

INTRODUCTION

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, increased the global mortality rate due to the worsening of heart, arterial, and lung diseases, among others, which were related to obesity, reduced physical activity, and sedentary lifestyles caused by social isolation measures, such as quarantine in older adults. In this regard, the World Health Organization (WHO) maintains that a sedentary lifestyle has negative effects on people's physical and mental health[1,2].

During the COVID-19 pandemic, governments implemented mandatory measures such as social isolation, the use of masks, and vaccination campaigns, all under strict biosafety standards. These actions, while necessary to contain the spread of the virus, transformed the lifestyle of the population, especially that of older adults. This group, highly vulnerable to complications from the virus, was forced into prolonged confinement, which led to a progressive deterioration in their overall health[3].

The context of isolation significantly affected their physical and mental well-being, with an increase in symptoms of anx-

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iety, distress, boredom, and sedentary lifestyles. The drastic reduction in physical activity, coupled with the disruption of daily routines and limited social contact, had a negative impact on their autonomy and quality of life. In response to this situation, adopting new healthy habits, such as a balanced diet and regular physical activity, became a key strategy to counteract the adverse effects of confinement[4].

A balanced diet should include macronutrients such as proteins, carbohydrates, and fats, as well as micronutrients such as vitamins and minerals, in proportions appropriate to each individual's age, sex, and level of physical activity. Food not only meets physiological needs, but also influences a person's emotional and cognitive well-being. From a preventive and health promotion perspective, a healthy diet helps reduce the risk of chronic diseases such as obesity, type 2 diabetes, and cardiovascular disease[5,6].

According to a study conducted by the Uldarico Rocca Fernández Hospital in Villa El Salvador, 61.97% of patients in Lima who underwent several weeks of home confinement had at least one comorbidity, such as obesity (35.21%) and high blood pressure (32.39%)[7]. At the same time, specialists highlight that 80% of geriatric patients who contracted the coronavirus required mechanical ventilation, and many of them died[7].

In the research by Ventura & Zevallos[8], the results showed that 82% of older adults had healthy lifestyles in general, with 99% having favorable eating habits, characterized by a diet low in fat, sugar, and salt, although with low intake of dairy products and meat. In terms of sleep, 71% reported healthy patterns, with regular schedules and good quality rest. However, only 49% had adequate levels of physical activity, while 63% did not exercise at all and 77% spent their free time on sedentary activities such as watching television, which shows a high degree of sedentary behavior in this population.

Another study conducted in Trujillo by Cruzado et al.[9] found that COVID-19 quarantine in older adults had significant effects on their physical activity and mental health, but not on their eating behavior. In terms of diet, no changes were found in the number of daily meals or the frequency of diets or fasting, although there was a decrease in the consumption of alcoholic beverages and fast food. Physical activity decreased significantly, with an increase in low levels of physical activity from 63.4% to 75.1% during quarantine.

Also, the research by Ricardo et al.[10] focused on 130 older adults in Manta, Ecuador, and revealed that 83.07% of participants were at nutritional risk due to being overweight or obese, with a notable prevalence of class 1 obesity, especially in women. Dietary habits showed that men consumed more cereals, roots, tubers, and dairy products, while women preferred more fruits and vegetables. Meat consumption was widespread, eggs were very popular, and legumes were rarely consumed.

In the study by Jeruszka et al.[11], they found that greater adherence to the 'pro-healthy and more active' pattern was associated with better self-perceived health (OR = 1.86) and a good/very good appetite (OR = 2.56). Conversely, this pattern was less common in older adults at risk of malnutrition (OR = 0.37) or a decrease in food intake (OR = 0.46). Decreased food intake, often due to loss of appetite or difficulty chewing or swallowing, was inversely associated with the pro-healthy pattern.

Finally, da Silva et al.[12] examined 10,789 older adults with hypertension in Brazil. This study sought to correlate nutritional status, health risk behaviors, eating habits, and the presence of diabetes with levels of physical activity and exercise. The results indicated that a higher body mass index (BMI), advanced age, screen time (only for physical activity), alcohol and tobacco consumption, and a higher score for ultra-processed food consumption reduced the likelihood of being sufficiently active or exercising. On the other hand, being male, having more years of education, and consuming more minimally processed foods increased these probabilities.

Healthy eating is defined as the balanced intake of essential nutrients that allow the body to maintain optimal health and prevent disease. Healthy eating in older adults is currently supported by the Integrated Model of Nutritional Behavior in Aging, a recent framework that combines biological, psychological, and social factors to explain dietary decisions in old age. Functional perception, referring to how older adults interpret the link between what they eat and their physical capacity; emotional access to food, which includes attachment to cultural habits, grief over the loss of flavors, or appetite disorders linked to loneliness; and contextualized nutritional literacy, that is, understanding recommendations adapted to chronic conditions such as diabetes or hypertension. These dimensions highlight that eating well is not just a matter of availability, but of meaning, mental health, and realistic understanding[13,14].

Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure above resting levels. The Community-Based Active Aging Model represents an advance over traditional models by focusing not on the isolated individual, but on their interaction with their immediate environment. Its key dimensions are: perceived safety in public spaces, a determining factor in going out for a walk or exercising outdoors; social cohesion in exercise programs, where participating in groups improves adherence more than individual interventions; and negotiated functional autonomy, which recognizes that many older adults adjust their activity according to family support or fear of falling[15,16].

This modern approach allows us to understand that promoting healthy lifestyles in old age does not depend solely on information campaigns, but on transforming environments,

strengthening social networks, and recognizing life experiences as part of the healthy process.

Eating habits are influenced by economic, cultural, and environmental factors, so promoting healthy eating requires comprehensive strategies that consider nutrition education, access to fresh food, and awareness of responsible consumption. In terms of education and behavior, adopting healthy eating habits is related to learning, motivation, and self-management of health. Therefore, healthy eating is not only understood as a set of nutritional recommendations, but as a dynamic process that involves knowledge, attitudes, and skills to make informed decisions that promote overall health[17,18].

In addition, physical activity is recognized as having a positive impact on mental health, reducing levels of stress, anxiety, and depressive symptoms, which highlights its integral role in physical and emotional well-being. Regular exercise depends on individual, social, and environmental factors, so promoting it requires strategies that include education, access to safe spaces, and personal motivation. This dimension underscores the importance of considering physical activity as an essential component of public health policies[19,20].

Overall, there is a complex interaction between diet, nutritional status, physical activity, and various health and socioeconomic factors in the older adult population. All highlight the importance of healthy lifestyle habits for proper aging, while identifying challenges such as overweight, low physical activity, and unhealthy food consumption. In addition, the risk of malnutrition and decreased appetite are recurring concerns, especially in relation to adherence to healthier eating patterns and participation in physical activity.

The objective of this research was to determine the relationship between healthy eating and physical activity in older adults at a senior citizens' club in Lima. It also measured their nutritional knowledge, emotional access, and food autonomy.

MATERIALS AND METHODS

The study was conducted using a quantitative research approach, which involves collecting numerical data to evaluate hypotheses and patterns of behavior. A cross-sectional correlational study design was adopted, allowing the researcher to explore the connections between events and phenomena. This facilitated the practical evaluation of correlations between variables at a specific point in time[21].

To this end, 58 participants (39 women = 67%; 19 men = 33%) aged between 60 and 75 were selected. The inclusion criteria were older adults with overweight or obesity, as well as those who reported daily physical activity. Exclusion criteria included the presence of physical or cognitive limitations. Convenience sampling was used at the Lima senior citizens' club, selecting those who met the study criteria. To collect the information, an expert-validated instrument with content reliability (Cronbach's alpha = 0.85) was applied, using a Likert scale from 1 to 5 (1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree) to measure diet. and an adapted questionnaire (GPAQ) to measure physical activity with a reliability of (KR20 = 0.87).

The data were analyzed using IBM SPSS Statistics v29 software. Initially, the database was coded to ensure the integrity of the records. Categorical variables were expressed in frequencies and percentages, while the ordinal variable was presented as means and standard deviations or medians, depending on the distribution. The Kolmogorov-Smirnov test was applied to assess normality. Since the feeding dimensions did not present a normal distribution, inferential analyses were performed using non-parametric tests, specifically Spearman's rho correlation to examine the association between eating dimensions (Likert) and physical activity (dichotomized). All analyses were performed with a significance level of $p < 0.05$[22].

The study did not require formal approval from an institutional ethics committee; however, it adhered to the ethical principles set out in the Declaration of Helsinki. Participants were informed of the research objectives before completing the questionnaire and, through informed consent, agreed to participate voluntarily, without any risk.

RESULTS

Table 1 shows that, with advancing age, levels of healthy eating and physical activity decline, especially among men. In men, emotional access to food drops dramatically (to 0% in those over 70), suggesting greater loneliness and risk of malnutrition. Although physical activity decreases in both sexes, the gender gap is smaller.

Figure 1 shows a multidimensional comparison between women and men in six key health indicators. Women have significantly higher levels in dimensions related to healthy eating, especially in nutritional knowledge (77% vs. 47%) and food autonomy (77% vs. 42%). Emotional access to food is also higher in women (59% vs. 16%). In physical activity, both groups are similar (59% vs. 58%), although men participate less in group programs and receive less family support.

In Table 2, food autonomy showed a moderate correlation ($r = 0.41$, $p = 0.001$), indicating that those who have greater control over their food choices are also more likely to be physically active. Similarly, nutritional knowledge showed a correlation ($r = 0.38$, $p = 0.003$), reflecting that people who are more informed about health tend to adopt more active lifestyles. Finally, emotional access to food showed a weak association ($r = 0.29$, $p = 0.028$), suggesting a link with emotional well-being and social relationships.

In Table 3, the percentage of people with favorable nutritional knowledge was 85% among active individuals, compared to

Table 1. Relationship between healthy eating and physical activity

Age group	Gender	n	Nutritional knowledge (%)	Emotional access (%)	Food autonomy (%)	Physical activity (%)	Group program (%)	Family support (%)
60-64	M	14	93	71	93	79	64	71
60-64	H	6	67	17	67	83	50	67
65-69	M	13	77	62	77	62	54	62
65-69	H	6	50	33	50	67	33	50
70-75	M	12	58	42	58	42	42	50
70-75	H	7	29	0	14	43	29	43
Total	M	39	77	59	77	59	51	56
Total	H	19	47	16	42	58	42	47

F (female), M (male).

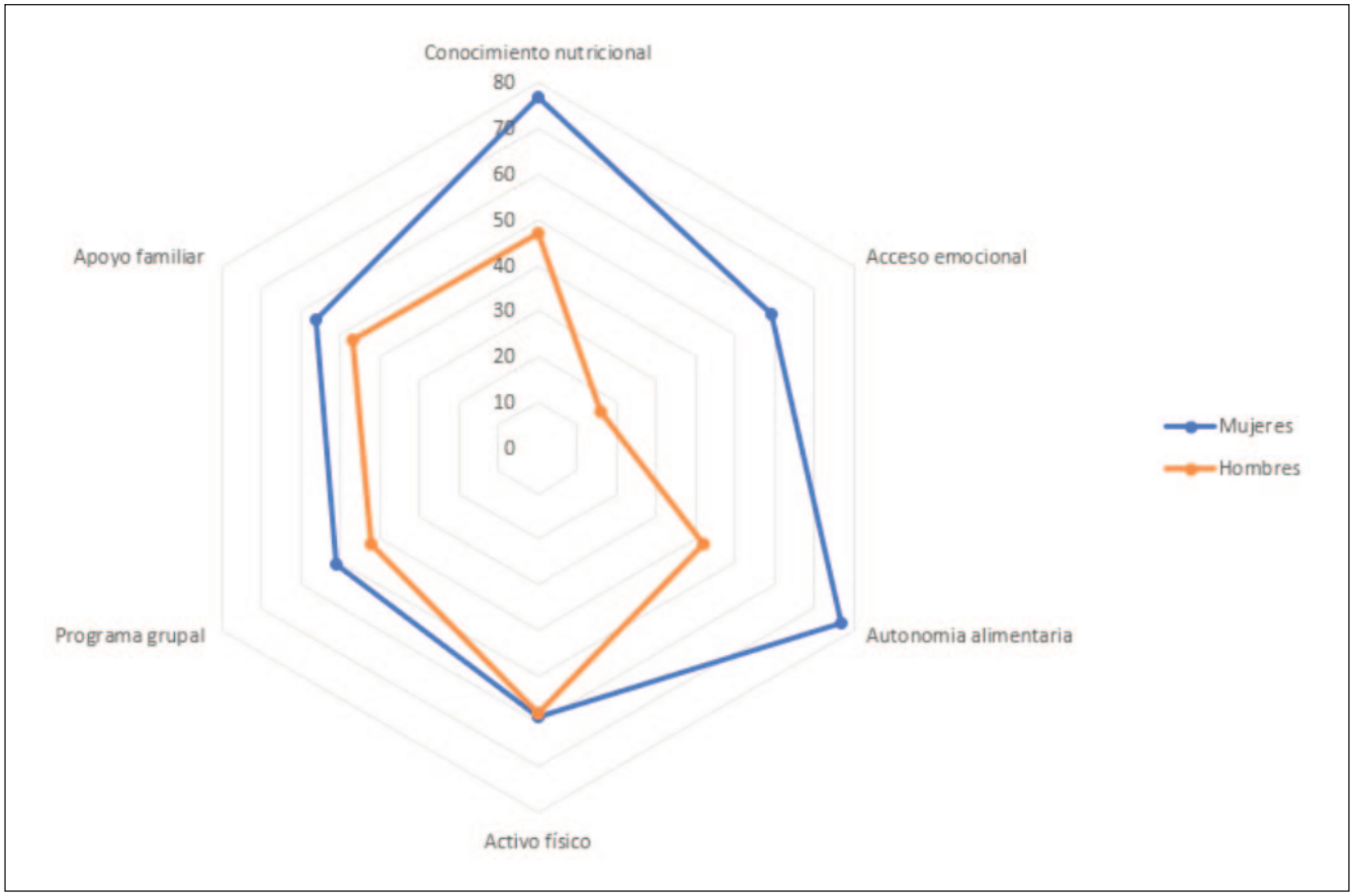

Figure 1. Comparison of healthy eating and physical activity dimensions between men and women

Table 2. Correlations between dimensions of healthy eating and physical activity in older adults

Eating dimension	Eating dimension Coefficient r	P value
Nutritional knowledge	0.38	0.003
Emotional access to food	0.29	0.028
Food autonomy	0.41	0.001

activity levels. These data coincide with our sample, where overweight or obese participants predominated, and underscore the need for specific interventions that address exercise as a non-negotiable pillar of healthy aging[9,10].

Likewise, physically active adults have significantly higher percentages of favorable levels in the three dimensions of eating: nutritional knowledge (85% vs. 50%), emotional access (71% vs. 38%), and, especially, food autonomy (82% vs. 42%). The latter showed the largest absolute difference (+40%) and a highly significant p-value (p = 0.002), which

Table 3. Differences in healthy eating dimensions between active and inactive older adults

Dimension	Not active = 24	Active = 34	Absolute difference	P value
Nutritional knowledge	50%	85%	+35%	0.004
Emotional access to food	38%	71%	+33%	0.018
Food autonomy	42%	82%	+40%	0.002

50% among non-active individuals, with a difference of 35% (p = 0.004). In terms of emotional access, 71% of active individuals reported a positive relationship with food, compared to 38% of non-active individuals (+33%, p = 0.018). The most marked gap was observed in food autonomy, where 82% of active individuals showed control over their food choices, compared to only 42% of inactive individuals (+40%, p = 0.002).

DISCUSSION

The findings of this study show a positive and statistically significant relationship between healthy eating and physical activity in older adults, which is in line with international studies that highlight the coexistence of healthy behaviors in this population. Although some reports indicate that eating behavior was not modified during the COVID-19 pandemic, as in Trujillo, where the number of meals and frequency of diets remained unchanged, the results reveal that those who adopt favorable eating habits also tend to be physically active, suggesting that these are not isolated behaviors, but rather a comprehensive self-care profile. In this regard, our finding that only 49% of older adults engage in healthy physical activity contrasts with the 99% who have healthy eating habits[8]. This difference could be explained by the geographical context, the design of the instrument, or self-reporting bias, but it reinforces global evidence: sedentary lifestyles are one of the biggest barriers to health in older adults, even when other habits are adequate. This pattern is repeated in other contexts: in Trujillo, quarantine increased the low level of physical activity from 63.4% to 75.1%, and in Manta (Ecuador), most older adults are at nutritional risk and have low physical

reinforces findings such as those of the Polish study[11], where greater adherence to a pro-healthy and active pattern was associated with better perceived health (OR = 1.86) and good appetite (OR = 2.56). In this context, autonomy emerges as a key factor: those who freely decide what to eat are also more likely to exercise, i.e., personal control drives the sustainable adoption of healthy habits.

Furthermore, the moderate correlation between food autonomy and physical activity (r = 0.41) reflects that empowerment in decision-making transcends food. Likewise, nutritional knowledge (r = 0.38) and emotional access (r = 0.29) also showed significant associations, which is consistent with the Brazilian study[12] that found that consumption of ultra-processed foods reduces the likelihood of being active, while consumption of minimally processed foods increases it. This suggests that diet quality and lifestyle are deeply interconnected[23,24].

From a theoretical standpoint, this study provides empirical evidence that reinforces models by demonstrating that autonomy, knowledge, and emotional well-being are not isolated dimensions but act as common facilitators of multiple healthy behaviors. Furthermore, physical activity is the most vulnerable dimension, indicating that the factors influencing each behavior may vary depending on the cultural environment and confinement conditions[25]. From a practical perspective, these findings indicate that public health interventions should go beyond the isolated promotion of exercise or diet. Programs that integrate nutrition education, autonomy building, and emotional support, combined with accessible group physical activities, could have a multiplier effect. In addition, geriatric health services should incorporate joint as-

sessments of diet and physical activity as part of routine monitoring to detect risk patterns early.

Limitations of the study

The limitations of the study were that the cross-sectional design did not allow for establishing causality between healthy eating and physical activity; only a relationship could be established. In addition, the sample was selected for convenience and came from a single geographical context, which limits the generalizability of the results to other regions of the country with different sociocultural and economic realities.

CONCLUSIONS

The present study shows that healthy eating and physical activity are not isolated behaviors in older adults, but tend to occur together as part of a comprehensive lifestyle. Those who eat better, especially in terms of nutritional knowledge, emotional access, and, above all, autonomy, are also more likely to be physically active. This relationship reinforces the importance of designing interventions that do not work on each habit separately, but rather strengthen the education, emotional well-being, and decision-making capacity of older adults at the same time. Although some contexts showed stability in eating habits during the pandemic, sedentary lifestyles persist as a serious problem, with less than half of the participants complying with physical activity recommendations. Therefore, it is urgent to implement accessible and sustainable community programs that promote movement and quality nutrition, especially in a post-pandemic scenario where the risk of comorbidities remains high.

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