Date of receipt: January 4, 2022
Date of acceptance: March 7, 2022

ORIGINAL ARTICLE

https://dx.doi.org/10.14482/sun.38.3.614.592

Predictive variables of quality of life during the Covid-19 pandemic in Latin American adults

Variables predictoras de la calidad de vida durante la pandemia de Covid-19 en adultos latinoamericanos

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ABSTRACT

Objective: To evaluate the predictive variables of the quality of life in the Latin American adult population in a pandemic situation during the Covid-19 quarantine.

Methods: Descriptive, cross-sectional study. The population was composed of 3,101 adult inhabitants of Chile, Colombia, Mexico and Peru. Factors that increased the likelihood of poor quality of life were identified using logistic regression analysis. These analyses were adjusted for nutritional status, age, and geographic origin.

Results: Being female (OR=1.73; p=0.001), physically inactive (OR=1.85; p=0.001), con- suming tobacco (OR=1.29; p=0.026), alcohol (OR=1.31; p=0.002) and junk food (OR=2.04; p=0.001) increased the probability of having a decrease in the general health dimension of quality of life during a Covid-19 quarantine.

Conclusions: The findings in this study confirm the need to promote healthy habits and lifestyles in the population during quarantines in a pandemic, such as a healthy diet, practicing physical activity and avoiding prolonged sitting.

Keyword: quality of life, health, quarantine, Covid-19.

RESUMEN

Objetivo: Evaluar las variables predictoras de la calidad de vida en población adulta lati- noamericana en situación de pandemia durante la cuarentena por COVID-19.

Métodos: Estudio descriptivo, trasversal. La muestra estuvo compuesta por 3101 habitan- tes adultos de Chile, Colombia, México y Perú. Los factores que aumentaron la probabilidad de tener una baja calidad de vida se identificaron mediante un análisis de regresión logís- tica. Estos análisis fueron ajustados por estado nutricional, edad y procedencia geográfica.

Resultados: Ser de género femenino (OR=1.73; p=0.001), físicamente inactivo/a (OR=1.85; p=0.001), consumir tabaco (OR=1.29; p=0,026), alcohol (OR=1.31; p=0,002) y comida cha- tarra (OR=2.04; p=0,001) aumentaron la probabilidad de tener una disminución en la di- mensión salud general de la calidad de vida durante una cuarentena por Covid-19.

Conclusiones: Los hallazgos en este estudio confirman la necesidad de promover hábitos y estilos de vida saludables en la población durante las cuarentenas en una pandemia como, por ejemplo, una dieta sana, practicar actividad física y evitar estar mucho tiempo sentado.

Palabras clave: calidad de vida, salud, cuarentena, Covid-19.

Cómo citar: Pavón-León P, Cigarroa I, Zapata-Lamana R, Herrera Nivia C, Guzmán Muñoz E. Predictive variables of quality of life during the Covid-19 pandemic in Latin American adults [Variables predictoras de la calidad de vida durante la pandemia de Covid-19 en adultos latinoamericanos]. *Salud Uninorte*. 2022; 38(3): 804-818. https://dx.doi.org/10.14482/sun.38.3.614.592

INTRODUCTION

Covid-19 disease caused by the SARS-CoV-2,n coronavirus was first reported in Wuhan (China) on December 31, 2019 (1). In March 2020, the World Health Organization (WHO) declared the disease a pandemic. The first case in the Americas region was reported by the United States on January 20, 2020, Brazil was the second country to report a case on February 26, and then on February 27 in Mexico. Since then, it has spread to all countries in the region. Despite the measures implemented by Latin American countries to contain the pandemic, by May 26, 2020, it had surpassed Europe and the United States in the daily number of coronavirus infections (1,2).

One of the measures to contain the Covid-19 pandemic was social isolation and home confinement. These measures have proven effective in controlling the transmission of the disease; however, research has shown that they can have adverse effects on the quality of life of people in quarantine (3). Quality of life, according to WHO, is defined as individuals' perceptions of their position in life in the cultural and value context in which they live and in relation to their goals, expectations, standards and concerns (4).

The uncertainty of the Covid-19 pandemic and physical isolation have adverse effects on mental health in previously healthy individuals (5). Likewise, home confinement causes physical inactivity and sedentary behaviors, so it is important to encourage regular physical activity, as it generates positive effects on physical, social and mental health, positively impacting the respiratory and immune systems (6), which are the most affected by the SARS-CoV-2 coronavirus. Also, quarantine is associated with stress and depression that lead to unhealthy lifestyles, with a diet poor in fruits and vegetables and low intake of antioxidants and vitamins (7).

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It has been seen that during the Covid-19 quarantine the presence of depression was higher in people over 60 years of age with comorbidities, as well as in people who had a low social status, unhealthy diet, and were less physically active (8). Another study conducted during the Covid-19 pandemic through an online survey distributed through social networking platforms reports that more than half of the participants felt horrified and apprehensive

due to the pandemic (3). It has also been reported that in times of Covid-19 pandemic, the level of anxiety has a negative influence on quality of life, and personal identity, such as having certainty of goals and expectations, has a positive impact on quality of life (9). The results of these studies are based, mainly, on oriental population, being limited the existing information that refers to the impact of the Covid-19 pandemic in Latin American population.

This article presents the results obtained from a study carried out in four Latin American countries, the objective of which was to evaluate the predictor variables of quality of life in the Latin American population in a pandemic situation during the Covid-19 quarantine.

METHODS

The type of study was descriptive with an observational and cross-sectional design. The population was composed of inhabitants of Chile, Colombia, Mexico and Peru. The type of sampling was non-probabilistic and the participants were invited through posters published in social networks. People interested in participating were sent a link that displayed the questionnaires used in the study on a virtual platform (*Google forms*) (available between May 20 and June 10, 2020). Prior to deploying the questionnaires, participants had to approve an informed consent (approved by the Ethics Committee of the Universidad Santo Tomás, Chile. Code 45-20).

Participants included in this study met the following criteria: a) aged between 18 and 60 years; b) under preventive quarantine for Covid-19 (voluntary or imposed by health authorities). Persons with a diagnosis or suspicion of Covid-19 at the time of answering the questionnaires were excluded. Of 3382 people who agreed to participate, 3101 met these criteria, making up the sample of this research.

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Sociodemographic variables, nutritional status and life styles

The sociodemographic background was collected through a survey that considered age, gender, geographic origin (rural or urban) and educational level (elementary/middle or high school). Body weight and bipedal height were self-reported by the participants. From these variables we obtained the body mass index (BMI), which was calculated by dividing the body weight by the squared bipedal height (kg/m^2). The BMI was used to classify the participants

in normopoietic weight ≤ 24.9 kg/m2 and overweight ≥ 25.0 kg/m2 (10). The Chilean National Health Survey 2016-2017 was used to collect and categorize data associated with lifestyles, such as alcohol consumption, junk food, and smoking (11).

Physical activity level and sedentary behavior

The level of physical activity and sedentary behavior were obtained by means of the Inter-national Physical Activity Questionnaire (IPAQ) short version (12), which consists of 7 questions. The first 6 questions are used to estimate the level of physical activity from the report of intense, moderate and light physical activities during the last week. With these data, METs (*Metabolic-energy-equivalents*) were obtained as an indicator of total physical activity. Subsequently, participants were categorized into physically inactive when energy expenditure was equal to or less than 599 METs/min/week and physically active when energy expenditure was greater than or equal to 600 METs/min/week (13,14). The seventh question of the IPAQ was used to determine sedentary behavior, in which participants were considered sedentary when they spent less than or equal to 4 hours a day in sitting activities (15,16).

Quality of life

Quality of life was assessed by means of the SF-36 questionnaire (17). This self-perception instrument consists of 36 questions divided into 8 dimensions associated with the health of the participants evaluated. The dimensions considered by this questionnaire are: physical function, physical role, bodily pain, vitality, social function, emotional role, mental health and general health (17). The scores obtained from the questionnaire fluctuate on a scale from 0 to 100, where a higher score reflects a better quality of life (17). Once the data were collected, the arithmetic mean was calculated for each dimension evaluated and the participants were categorized into "below avera-

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ge" (high quality of life) and "above average" (low quality of life). This procedure for categorizing quality of life has been used in previous studies (18,19).

Data analysis

The SPSS 25.0 statistical program (SPSS 25.0 for Windows, SPSS Inc., IL, USA) was used for data analysis. The data were presented using the mean when the variables were continuous and percentage when the variables were categorical. A logistic regression analysis was performed

to identify the probability of having a low quality of life during the quarantine period by Covid-19 in each of the dimensions assessed with the SF-36 questionnaire. This analysis was adjusted for the variables age, nutritional status and geographic origin. Multicollinearity was checked by tolerance (values less than 0.10) and variance inflation factor (VIF) (values above 10.0). The results were presented as *odds ratios* (OR) with their respective 95 % confidence intervals (95 % CI). The significance level was defined as $p<0.05$.

RESULTS

Of the total number of participants evaluated, 39.8% were from Chile, 23.2% from Colombia, 15.1% from Mexico and 21.9% from Peru. Table 1 shows the general characteristics of the participants in this study. It was observed that 66.9 % were female, 88.4 % were from urban areas, 37.1 % were overweight, 35.1 % were physically inactive, 76.7 % were sedentary, 13.5 % were overweight, 35.1 % were physically inactive, 76.7 % were sedentary, 13.5 % consumed tobacco, 41.3 % alcohol and 8.2 % junk food.

Table 1. General characteristics of the sample

n = 3.101	
Age (mean and SD)	27,9 ± 12,0
Female gender (%)	66,9 (n = 2.075)
Male gender (%)	33,1 (n =1.026)
Urban origin (%)	88,4 (n = 2.741)
Excess weight (%)	37,1 (n = 1.151)
Higher education level (%)	55,0 (n = 1.705)
Physically inactive (%)	35,1 (n = 1.089)
Sedentary (%)	76,7 (n = 2.379)
Tobacco consumption (%)	13,5 (n = 419)
Alcohol consumption (%)	41,3 (n = 1.281)
Consumption of junk food (%)	8,2 (n = 255)

SD: standard deviation.

Source: own elaboration.

The mean scores obtained in the dimensions of perception of quality of life are shown in Table 2. It can be seen that general health and emotional role are the most diminished dimensions in the sample, with a score of 52.6 and 56.0, respectively. On the other hand, physical function and physical role were the dimensions best perceived by the participants, with a score of 91.2 and 85.6, respectively.

Table 2. Results of the quality of life perception dimensions (n = 3,101)

Media		DE	% above average	% below average
Physical function	91,2	15,4	67,9	32,1
Physical role	85,6	27,6	71,9	28,1
Body pain	75,9	23,7	54,1	45,9
Vitality	57,9	19,4	50,4	49,6
Social function	70,9	26,9	57,9	42,1
Emotional role	56,0	43,7	54,7	45,3
Mental health	63,7	19,6	54,3	45,7
General health	52,6	15,4	53,4	46,6

SD: standard deviation.

Source: own elaboration.

Logistic regression analyses for the *physical function*, *physical role*, *bodily pain* and *vitality* dimensions are summarized in Figure 1. The results showed that for the physical function dimension, being female (OR=1.73; p=0.001), being physically inactive (OR=1.85; p=0.001), tobacco use (OR=1.29; p=0.026), alcohol use (OR=1.31; p=0.002), and consumption of junk food (OR=2.04; p=0.001) increased the likelihood of having a decreased quality of life during a preventive quarantine.31; p=0.002) and consuming junk food (OR=2.04; p=0.001) increased the probability of having a decrease in quality of life during a preventive quarantine by Source: own elaboration

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with respect to their physically active male peers who do not consume tobacco, who do not consume alcohol and who do not consume junk food, respectively. For the *physical role* dimension, being physically inactive (OR=1.31; p=0.001), consuming alcohol (OR=1.41; p=0.001) and consuming junk food (OR=1.58; p=0.001) were variables associated with a higher probability of having a lower quality of life.

For the *bodily pain* dimension, the variables indicating a higher probability of having a low quality of life were female gender (OR=1.35; p=0.001), being physically inactive (OR=2.22; p=0.001), being sedentary (OR=1.29; p=0.002) and consuming junk food (OR=1.82; p=0.001). Likewise, for the *vitality* dimension, being female (OR=2.50; p=0.001), being physically inactive (OR=2.20; p=0.001), being sedentary (OR=1.90; p=0.001), consuming tobacco (OR=1.27; p=0.042) and consuming junk food (OR=2.05; p=0.001) were the variables that increased the risk of having a decrease in quality of life. The variable related to a higher educational level was considered a protective factor for the dimensions *physical function* (OR=0.64; p=0.001) and *physical role* (OR=0.69; p=0.001).

Logistic regression analyses for the dimensions *social function*, *emotional role*, *mental health* and *quality of life health* are summarized in Figure 2. For *social function*, being female (OR=1.16; p=0.001), being physically inactive (OR=1.35; p=0.001), being sedentary (OR=1.38; p=0.001), using tobacco (OR=1.25; p=0.040) and consuming junk food (OR=1.80; p=0.001) are factors that increased the probability of having a low quality of life. For *emotional role*, being female (OR=2.15; p=0.001), being physically inactive (OR=1.39; p=0.001), being sedentary (OR=1.61; p=0.001), using tobacco (OR=1.36; p=0.004) and consuming junk food (OR=1.40; p=0.001) were the variables that increased the risk of having a decreased quality of life during a COVID-19 preventive quarantine. Regarding *mental health*, being female (OR=2.03; p=0.001), being physically inactive (OR=1.63; p=0.001), being sedentary (OR=1.53; p=0.001), using tobacco (OR=1.28; p=0.004) and consuming junk food (OR=1.85; p=0.001) were the factors associated with low quality of life. In terms of *general health*, female participants (OR=1.62; p=0.001), who are physically inactive (OR=2.00; p=0.001), who use tobacco (OR=1.53; p=0.001), consume alcohol (OR=1.18; p=0.032) and eat junk food (OR=2.06; p=0.001) were more likely to have a low quality of life. The variable related to a higher educational level was considered a protective factor for the dimensions *emotional role* (OR=0.71; p=0.001), *mental health* (OR=0.82; p=0.001) and *general health* (OR=0.60; p=0.001).

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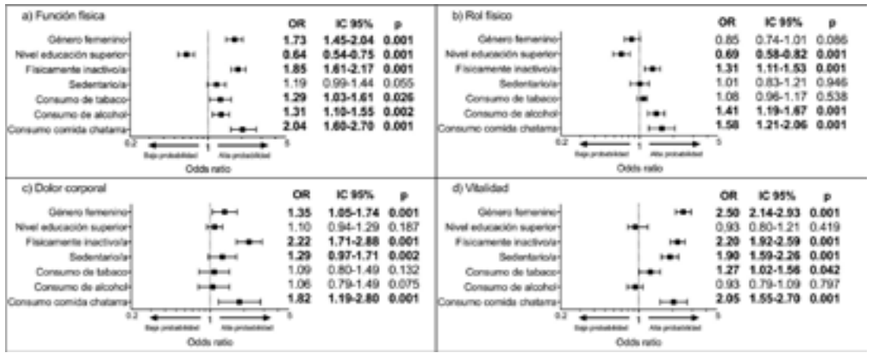
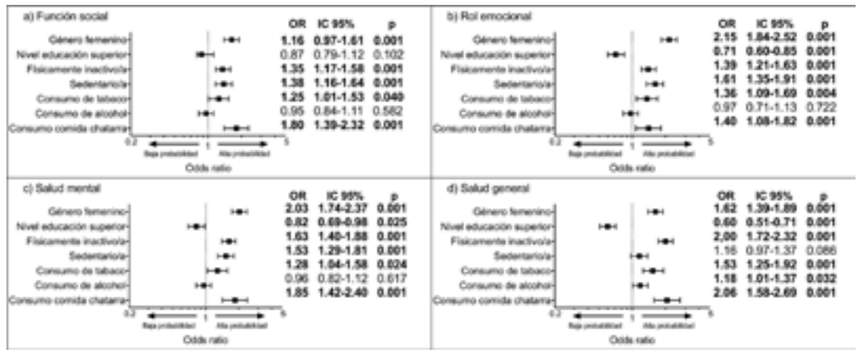


Source: own elaboration.

Figure 1. Predictor variables of the decrease in quality of life during the quarantine by Source: own elaboration in the dimensions physical function, physical role, bodily pain and vitality. Data presented as *odds ratio* (OR) and their respective 95 % CI. The analysis was adjusted for nutritional status, age and geographical origin. An OR > 1 indicates a higher probability of having a low quality of life. A p value < 0.05 was considered significant.



Source: own elaboration.

Figure 2. Predictor variables of the decrease in quality of life during the quarantine period by Covid-19 in social function, emotional role, mental and general health dimensions. Data presented as *odds ratio* (OR) and their respective 95% CI. The analysis was adjusted for nutritional status, age and geographic origin. An OR > 1 indicates a higher probability of having a low quality of life. A p-value < 0.05 was considered significant.

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DISCUSSION

This study presents an overview of the quality of life in pandemic situations in different Latin American countries, which has deteriorated due to the confinement measures imposed to contain the Covid-19 disease. The main finding reveals that being female, physically inactive, and consuming tobacco, alcohol and junk food increase the probability of having a decrease in the general health dimension of quality of life during a Covid-19 quarantine. Other studies investigating quality of life in pandemic situations have reported a deterioration in people's general and mental health (8, 20,21).

In our study, it has been observed that during the pandemic, physical function has been affected and, therefore, a limitation in the development of various physical activities, such as walking, climbing stairs, performing moderate to intense efforts, among others.

The risk of this limitation in physical function is higher in women, people who consume tobacco and alcohol, as well as those who consume junk food. This limitation in physical function represents a greater risk in women, people who consume tobacco and alcohol, as well as those who consume junk food. In addition, it was observed that being physically inactive also constitutes a risk factor for a deterioration in this dimension of quality of life. In this regard, it has been reported that due to social isolation, boredom is frequent, which has been associated with unhealthy lifestyles and a higher intake of fats, carbohydrates, and proteins (22). In addition to the above, forty and isolation cause stress, depression and anxiety, which induce people to eat foods rich in sugar and drink alcohol to feel better; people also reduce physical activity and recreational activities (7). Stress stimulates people to overeat, mainly in search of sugary "comfort foods" (23), which is more prevalent in women than in men (24).

This research showed that the risk of suffering bodily pain is presented mainly by women, people who are sedentary and who consume junk food. Similarly, in the *vitality* dimension, it was found that again women, sedentary people, and those who consume tobacco and junk food are more likely to have feeling of tiredness and exhaustion. It was also observed that having a higher level of education acted as a protective factor for the dimensions of *physical function* and *physical role*. In another study carried out during the Covid-19 pandemic, better quality of life was reported in men, in people with a higher level of education, a medium or high social level and who were more physically active (8), coinciding with some of our results. On the contrary, Kharshiing et al. identified in their study that demographic variables such as age, sex, educational level and socioeconomic income did not influence quality of life (9).

It is worth noting that women were the most affected in this pandemic situation compared to men since it interfered with their usual social life, which they perceived to have impaired their quality of life. Previous studies have considered the female gender as a risk factor that increases the probability of having a lower quality of life during the Covid-19 pandemic (8, 25). On the other hand, in mental health, which includes depression, anxiety, behavioral and emotional control, as well as the perception of overall current health, future health, and resistance to illness, women were more likely to have a lower quality of life. It has been proposed that confinement causes women to be exposed to an increased stress load, which threatens their quality of life, due to changes in the family dynamics in which they must combine activities such as teleworking, total care of children and domestic work (8). Similarly, it has been reported that after adverse and/or traumatic events, such as isolation due to a pandemic, negative thoughts and intrusive memories are more frequent in women than in men (26, 27).

One of the limitations of this research corresponds to the collection of data through self-reporting, which could lead to bias due to under- or overestimation of the participants in relation to the variables studied. Despite these limitations, this study presents important associations between sociodemographic variables and the perception of quality of life.

In conclusion, the results show that women are at greater risk than men of having a decrease in quality of life due to measures to contain the transmission of SARS-CoV-2. In addition, physical inactivity, sedentary behavior, unhealthy food consumption, alcohol drinking and smoking are among the main risk factors present in the decline of the eight dimensions studied (physical function, physical role, bodily pain, vitality, social function, emotional role, mental health and general health). The findings of this study confirm the need to promote healthy habits and lifestyles in the population during the pandemic, such as, for example, a healthy diet, physical activity and avoiding prolonged sitting. Also, psychological support should be provided to people, including at the end of social isolation to assess whether stress, anxiety and depression symptoms persist. Finally, the risk factors associated with a decrease in quality of life predominated in the four Latin American countries studied in a similar way.

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Conflict of interest: None.

Financing: None.

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