



Review Article

Information on lifestyle habits of individuals with COVID-19: Review of literature

Informações sobre hábitos de vida em indivíduos com COVID-19: Revisão da literatura

Información sobre los hábitos de vida de las personas con COVID-19 en todo el mundo: revisión de la literatura

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Corresponding Author:

Luiz Carlos Francelino Silva junior

luizcfsj@gmail.com

Luiz Carlos Francelino Silva Junior¹ (0000-0002-9934-4174); Rafaela Campos Alcântara¹ (0000-0002-7956-4233); Gabriel Monteiro Arnozo¹ (0000-0001-8567-7085); Tatiana Farias de Oliveira¹ (0000-0002-4186-6287); Fernanda Mayara Santos Santana¹ (0000-0001-6920-937X); Etvaldo Rodrigues da Silva Filho¹ (0000-0001-7144-1709); Aisla Graciele Galdino dos Santos¹ (0000-0002-2119-3855); Euclides José Oliveira da Cunha¹ (0000-0002-8467-8657); Saulo Henrique Salgueiro de Aquino¹ (0000-0001-7458-1790); Rodrigo da Rosa Mesquita¹ (0000-0002-8212-4853); Gibson Barros de Almeida Santana (0000-0003-2443-720X); Antônio Leopoldo do Nascimento Gama Albuquerque (0000-0002-3047-1263)

¹ Departamento de Medicina. Universidade Federal de Alagoas, Arapiraca, Brasil.

² Serviço de Atendimento Móvel de Urgência (SAMU), Arapiraca, Brasil.

Abstract

This study sought to systematize information about life habits in epidemiological studies in patients with COVID-19. This is a systematic review conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommendations. We selected articles published in PubMed, Medline and Scopus database between January 1 and April 24, 2020, using the descriptors COVID-19, SARS-CoV-2, 2019-nCoV, n-CoV and coronavirus combined with clinical profile and epidemiology. In this study, we sought to identify characteristics about patients' lifestyle habits: smoking (current or previous), alcohol consumption and physical activity. We analyzed 7489 scientific studies, of which 158 had clinical and epidemiological variables, amounting 100.563 patients. 30 studies included lifestyle habits (8,323 individuals) from five countries: Brazil, China, Korea, Spain and USA (593). A percentage of 56.5% (n = 4624) were men and 44.4% (n = 3687) women. Among the variables, smoking (current or previous) was present in 30 investigations; alcohol consumption in four and physical activity was not observed in any article. The highest smoking rates were observed in the USA (21.79%) and Spain (18.75%). Alcohol consumption was 7.73%. Being higher in Brazil (17.28%). New studies on the epidemiological and clinical aspects of COVID-19 include variables about lifestyle, especially smoking, alcohol consumption and physical activity. This information may offer future knowledge about the factors of illness and severity of COVID-19 in the population.

Descriptors: Risk factors. Coronavirus infection. Systematic review.

Resumo

Este estudo buscou sistematizar informações sobre hábitos de vida em estudos epidemiológicos em pacientes com COVID-19. Esta é uma revisão sistemática conduzida de acordo com as recomendações dos Itens de Relatório Preferenciais para Revisões Sistemáticas e Meta-análises (PRISMA). Selecionamos artigos publicados nas bases de dados PubMed, Medline e Scopus entre 1º de janeiro e 24 de abril de 2020, utilizando os descritores COVID-19, SARS-CoV-2, 2019-nCoV, n-CoV e coronavírus combinados com perfil clínico e epidemiologia. Neste estudo, buscou-se identificar características sobre os hábitos de vida dos pacientes: tabagismo (atual ou anterior), consumo de álcool e atividade física. Foram analisados 7.489 estudos científicos, dos quais 158 apresentavam variáveis clínicas e epidemiológicas, totalizando 100.563 pacientes. 30 estudos incluíram hábitos de vida (8.323 indivíduos) de cinco países: Brasil, China, Coreia, Espanha e EUA (593). Um percentual de 56,5% (n = 4624) eram homens e 44,4% (n = 3687) mulheres. Dentre as variáveis, o tabagismo (atual ou anterior) esteve presente em 30 investigações; consumo de álcool em quatro e atividade física não foi observada em nenhum artigo. As maiores taxas de tabagismo foram observadas nos EUA (21,79%) e na Espanha (18,75%). O consumo de álcool foi de 7,73%. Sendo maior no Brasil (17,28%). Novos estudos sobre os aspectos epidemiológicos e clínicos do COVID-19 incluem variáveis sobre estilo de vida, principalmente tabagismo, etilismo e atividade física. Essas informações podem oferecer conhecimento futuro sobre os fatores de doença e gravidade de COVID-19 na população.

Descritores: Fatores de risco. Contágio do coronavírus. Revisão sistemática.

Resumen

Se trata de un estudio que busca sistematizar información sobre hábitos de vida en estudios epidemiológicos en pacientes con COVID-19. Esta es una revisión sistemática realizada de acuerdo con las recomendaciones de

Elementos de informe preferidos para revisiones sistemáticas y metaanálisis (PRISMA). Se seleccionaron los artículos publicados en la base de datos PubMed, Medline y Scopus entre el 1 de enero y el 24 de abril de 2020, utilizando los descriptores COVID-19, SARS-CoV-2, 2019-nCoV, n-CoV y coronavirus combinados con perfil clínico y epidemiología. En este estudio, buscamos identificar características sobre los hábitos de vida de los pacientes: tabaquismo (actual o previo), consumo de alcohol y actividad física. Se analizaron 7489 estudios científicos, de los cuales 158 tenían variables clínicas y epidemiológicas, totalizando 100,563 pacientes. Treinta estudios incluyeron hábitos de estilo de vida (8.323 personas) de cinco países: Brasil, China, Corea, España y EE. UU. (593). Un porcentaje del 56,5% (n = 4624) eran hombres y el 44,4% (n = 3687) mujeres. Entre las variables, el tabaquismo (actual o previo) estuvo presente en 30 investigaciones; en cuatro no se observó consumo de alcohol ni actividad física en ningún artículo. Las tasas de tabaquismo más altas se observaron en EE. UU. (21,79%) y España (18,75%). El consumo de alcohol fue del 7,73%. Siendo mayor en Brasil (17,28%). Los nuevos estudios sobre los aspectos epidemiológicos y clínicos de COVID-19 incluyen variables sobre estilo de vida, especialmente tabaquismo, consumo de alcohol y actividad física. Esta información puede ofrecer conocimientos futuros sobre los factores de la enfermedad y la gravedad de COVID-19 en la población.

Descriptores: Factores de riesgo. Infección de coronavirus. Revisión sistemática.

Introduction

In late 2019, an outbreak of pneumonia was observed in Wuhan, People's Republic of China¹. On January 6, it was identified that the disease was caused by a new type of coronavirus, dubbed SARS-CoV-2, causative agent of the COVID-19 disease¹. Since then, COVID-19 has spread all over the continents, resulting in a pandemic, declared on March 11, 2020 by the World Health Organization (WHO)².

In April 21, 2020, there were already over 2,5 million cases of COVID-19 around the globe and more than 175 thousand deaths due to the disease. The USA ranks first in confirmed cases (about 810 thousand) and Italy in number of deaths (about 24 thousand deaths). It should be noted that this scenario is still growing daily³.

Faced with the new disease, scientists around the world have fought a real battle against time: on the one hand, a respiratory disease with a rapidly aggressive clinical pattern that results in failure of the respiratory function, resulting in the need for critical care; on another, scientists seeking to raise evidence that can assist health professionals in clinical decision-making and governments in the context of collective actions.

Among the evidence, the need to identify risk profiles, that increase the pathogenicity of the disease and the risk of death, emerges. Among the factors already known, previous comorbidities stand out, such as cardiovascular diseases (hypertension, diabetes, coronary heart disease), respiratory diseases (Obstructive Pulmonary Disease and asthma), immunosuppressants, cancer, transplant patients, among other complicating factors⁴⁻⁵.

However, if the signs / symptoms, dissemination mechanisms, preventive measures and comorbidities are already known, the same is not true when it comes to life habits. It is not known, with due clarity, the prevalence of these lifestyle habits in hospitalized patients and their influence on the severity and clinical outcome of individuals infected with SARS-CoV-2.

Among the most common lifestyle habits, smoking, alcohol consumption and physical activity stand out. As a respiratory disease, it is likely that such habits may be related to the risk of illness and the severity of the symptoms⁶. However, the real effects of these habits have been little explored.

The first question to be answered is: "- Were the variables about lifestyle habits collected in studies involving patients with COVID-19?" If the answer is affirmative, a second must be answered: "- What is the prevalence of these habits?" Based on these questions, this study seeks to systematize the current literature on the life habits of patients hospitalized with COVID-19 in the world.

Methods

Data sources and Search strategies

This is a systematic review conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) ⁷ recommendations and registered in the platform International Prospective Register of Systematic Reviews (PROSPERO), under the number 189122. The research question was: What is the prevalence of life habits in individuals hospitalized with COVID-19?

For the systematic review, we selected studies that address epidemiological characteristics of patients hospitalized with COVID-19. We selected articles published in PubMed, Medline and Scopus database between January 1 and April 24, 2020, using the descriptors COVID-19, SARS-CoV-2, 2019-nCoV, n-CoV and coronavirus combined with clinical profile and epidemiology. In this study, we sought to identify characteristics about patients' lifestyle habits: smoking (current or previous), alcohol consumption and physical activity. For the search strategy, the Boolean operators "AND" and "OR" were used. In addition, a manual search was carried out for references cited in the articles.

Research variables

In this study, we sought to identify characteristics about patients' lifestyle habits: smoking (current or previous), alcohol consumption and physical activity.

Eligibility criteria

We included clinical trials, cohorts, cross-sectional, clinical cases and case series studies (published and pre-print). Government epidemiological bulletins, comments, literature reviews, articles without full access to content and studies in animals were excluded.

Selection of studies

The search was carried out by four independent researchers. After this step, three researchers independently performed the following steps: 1- reading the title and summary to identify potential eligible studies; 2- reading the full text; 3- collection of variables and assembly of the database. The divergences were analyzed and resolved by consensus between the researchers.

Data extraction

For data extraction, the researchers created a database. The data was entered by a first investigator and subsequently checked by a second investigator on the team. The systematization / analysis of the data was conducted by two other independent researchers.

Results

Initially, 7489 scientific productions were found in the databases. Of these, 158 met the initial inclusion criteria and totaled 100.563 patients from all continents. After a complete reading, 30 studies [8-37] had variables on lifestyle habits, totaling 8323 patients from five countries (Figure 1, Table 1): Brazil (n = 81), China (7573), Korea (28), Spain (48) and USA (593). A percentage of 56.5% (n = 4624) were men and 44.4% (n = 3687) women. Among the variables, smoking (current

or previous) was present in 29 investigations; alcohol consumption in four and physical activity was not observed in any article.

Figure 1- Flowchart of the study selection process, 2020.

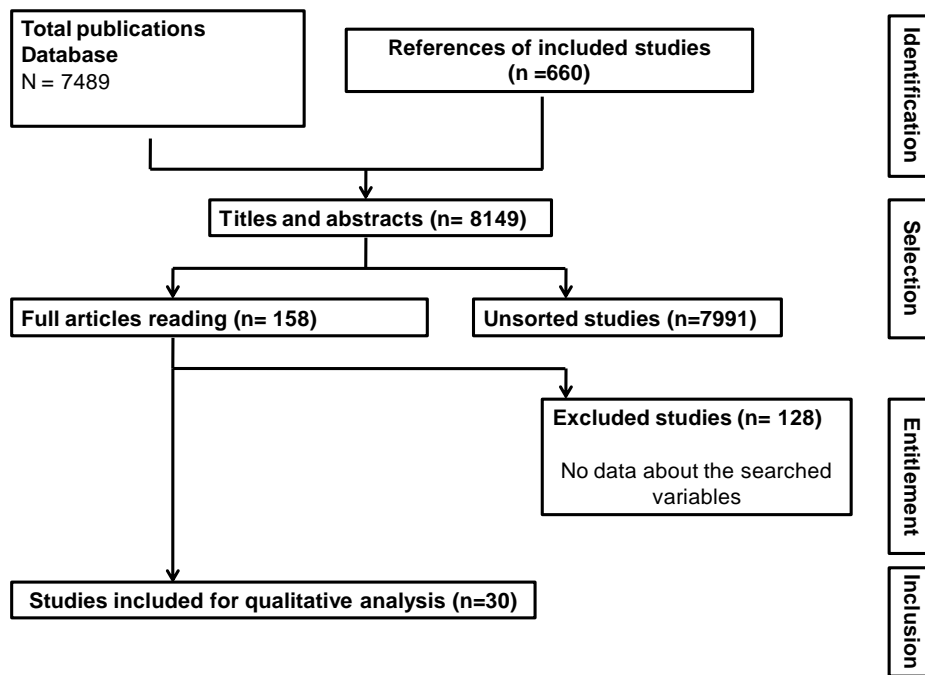


Table 1- Characterization of the scientific articles included in the study.

Reference	Country	Population	Smoking	Alcohol consumption	Result
Borba et al. ⁸	Brazil	81	4	14	One current smoker was treated with a high dose of hydroxychloroquine and 8 among former smokers; among patients with high alcohol consumption, six used a high dose of hydroxychloroquine.
Ian et al. ⁹	China	324	-	25	-
Chen et al. ¹⁰	China	99	2	-	Both smoking patients passed away.
Yang et al. ¹¹	China	52	2	-	Both smoking patients survived.
Chen et al. ¹²	China	29	2	-	-

Zhang et al. ¹³	China	140	2	-	6 patients were in serious health condition (4 ex smokers, 2 current smokers).
Li et al. ¹⁴	China	17	3	3	Among smokers, 2 patients were discharged as well as 1 alcoholic patient.
Song et al. ¹⁵	China	51	3	-	-
Huang et al. ¹⁶	China	41	3	-	Smoking patients did not need ICU care.
Wang et al. ¹⁷	China	26	5	-	-
Zhang et al. ¹⁸	China	120	6	-	All 6 smokers were complicated cases of Covid-19.
Zhou et al. ¹⁹	China	191	11	-	5 (45.45%) of the total smoking patients did not survive.
Wang et al. ²⁰	China	125	16	-	Among the 25 critical patients, 7 (28%) were smokers. History of smoking was statistically significant, and may be a risk factor for poor prognosis, especially in poor populations.
Guo et al. ²¹	China	187	18	-	Smoking rate did not differentiate between patients with elevated or normal troponin T.
Ji et al. ²²	China	202	19	6	Alcohol consumption and smoking were not statistically associated with covid-19 progression.
Liu et al. ²³	China	56	22	-	-
Shi et al. ²⁴	China	487	40	-	34 (7.8%) of mild cases and 6 (12.2%) of severe cases were smokers
Li et al. ²⁵	China	548	41	-	About 19.2% of critically ill patients were smokers.
Jin et al. ²⁶	China	651	41	-	-
Feng et al. ²⁷	China	476	44	37	Among the 68 critical cases, 10 (14.7%) had a history of smoking and 11 (16.2%) had a history of alcohol consumption.
Lian et al. ²⁸	China	788	54	-	Proportional prevalence of smokers < 60 years old. There was no significant correlation with covid-19 symptoms.
Liang et al. ²⁹	China	1590	111	-	-
Guan et al. ³⁰	China	1099	137	-	16.9% of covid-19 severe cases were smoking patients.
Chen et al. ³¹	China	274	19	-	Smoking patients represented 8% of the total number of deaths.
Kim et al. ³²	Korea	28	5	-	60% of smoking patients had pneumonia, 40% with bilateral presentation.
Barrasa et al. ³³	Spain	48	9	-	19% of cases were associated with Procalcitonin levels > 0.5 µg / L, presenting a 16% higher risk of death in 7 days.
Moein et al. ³⁴	USA	60	2	-	Control cohort had many more smoking patients, study suggests protection of the host against lung injury.
Cholankeril et al. ³⁵	USA	116	3	-	94.8% of the evaluated patients presented with cough.
Bhatraju et al. ³⁶	USA	24	5	-	Only half of the patients had fever at the time of hospital admission. Data on current or previous cigarette consumption from 1 patient was missing.

Goyal et al. ³⁷	USA	393	20	-	4.6% of smoking patients required invasive mechanical ventilation.
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The study population with the variable tobacco consumption was 7999. Among these, the smoking rate was 8.1% (n = 648) considering current consumption and 10.46% (n = 837), including ex-smokers. The highest smoking rates were observed in the USA (21.79%) and Spain (18.75%). The sum of the population of the five

articles with information about alcohol consumption was 1100, of which alcohol consumption was observed in 85 (7.73%). Alcohol consumption was higher in Brazil (17.28%) (Table 2).

Table 2- Smoking and alcohol consumption in hospitalized patients with COVID-19, 2020.

a) Smoking					
Country	Number of studies	Number of patients	Current smokers	Ex-smokers	Overall rate (%)
Brazil	1	81	4	11	18.51
China	22/23 ¹	7249	600	79	9.36
Korea	01	28	5	-	17.86
Spain	01	48	9	-	18.75
USA	04	593	30	99	21.75
Total	29	7999	648	189	10.46
b) Alcohol consumption					
Country	Number of studies	Number of patients	Alcohol consumption		Overall rate (%)
China	3	695	71		10.22
Brazil	1	81	14		17.28
Total	4	776	85		10.95

Legend : ¹01 report did not present data about smoking.

Discussion

Cigarette consumption was the most observed theme among lifestyle habits in the researched studies. SARS-CoV-2 penetrates the cell of the epithelial and alveolar mucosa of the lung using the ACE-2 receptor and it is known that this mucosa is damaged by the substances present in cigarettes, suggesting greater severity of the disease in smokers when compared to non-smokers³⁸⁻³⁹. Additionally, the act of smoking itself could operate as a virus carrier for the face, increasing the risk of contamination⁴⁰.

During the pandemic, social isolation and the rise in individuals' level of psychological stress has been an additional concern. This context changes the lifestyle of

the population, limiting the practice of physical activity and increasing the risk of adopting less healthy habits, such as alcohol consumption, smoking and unbalanced diet. Individuals who face or have faced problems with alcohol or cigarette consumption tend to relapse in the face of moments of anxiety and stress, such as the current one^{6, 41}.

In another part of the population, in turn, fear of the virus and its consequences have the opposite effect. As it is a disease that can presents with severe impairment of pulmonary and cardiac functions and, knowing the deleterious effects of smoking, they have adopted an attitude of interrupting cigarette consumption⁴¹.

In recent years, WHO and member countries have been engaged in the fight against smoking, with satisfactory results. Even so, in 2018, only 23 countries implemented mechanisms to support individuals who wish to quit smoking. China, the first epicenter of the Covid-19 pandemic, is the world's largest tobacco consumer. About 22% of the population actively smokes and tobacco causes about 1 million deaths of smokers as well as about 100,000 deaths in passive smokers, each year⁴². In the USA, the country with the highest number of registered cases, there was a recent explosion in the consumption of electronic cigarettes among young people, rising from 1.5% in 2011 to 20.8% in 2018⁴⁴. In Brazil, on the other hand, the path is reversed, even though still far from ideal. The proportion of adult smokers decreased from 35% in 1989 to 18.5% in 2008. In 2017, the prevalence of smoking was 11%⁴⁵. In adolescents, this rate was around 17%, according to data from the Education at School Program (PSE), in 2015⁴⁴.

Although tobacco consumption is the most prominent element, it is necessary to highlight alcohol consumption. In the human body, alcohol reduces the synthesis of albumin, serum concentrations of magnesium, calcium and phosphate, increasing lactate and ketone, as well as oxygen⁴⁶. In these individuals, the incidence of sepsis, especially of respiratory origin, is higher than in the general population⁴⁷. There is still insufficient evidence to indicate the effects of alcohol consumption on the spread and severity of SARS-CoV-2.

Conclusions

Finally, the practice of physical activity, not observed in any study, represents a knowledge gap to be filled. We recommend that new studies on the epidemiological and clinical aspects of COVID-19 include variables about lifestyle, especially smoking, alcohol consumption and physical activity. This information may offer future knowledge about the factors of illness and severity of COVID-19 in the population. In addition, studies are still much concentrated in China, requiring research with other population profiles.

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