



Original article

Prevalence of signs and symptoms of COVID-19 self-reported by teachers in Minas Gerais

Prevalência de sinais e sintomas autorrelatados da COVID-19 por professores em Minas Gerais

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Abstract

Objective: to verify the prevalence of the main self-reported clinical findings of teachers who confirmedly contracted COVID-19 in the state of Minas Gerais, Brazil. **Materials and Methods:** a study developed on a population composed by teachers residing in the state of Minas Gerais, whose data were collected between August 20 and September 11, 2020 in an online form, through the Google Forms platform. Self-reported signs and symptoms of COVID-19 were investigated, such as: fever, dry cough, cough with secretion, chills, sore throat, fatigue or tiredness, runny nose, shortness of breath, nasal congestion, headache, ageusia and anosmia, nausea or vomiting, diarrhea, joint pain and muscle pain. **Results:** 15,641 answered forms were received, which revealed 181 teachers with confirmed COVID-19 cases, among which 69.6% presented headache; 63.5%, ageusia and anosmia; 52.5%, dry cough; and 49.2%, fatigue or tiredness. **Conclusion:** the most prevailing signs and symptoms stated by the individuals with positive COVID-19 tests are relevant for the suspicion and consequent performance of diagnostic tests.

Keywords: Prevalence. Signs and symptoms. COVID-19. School teachers.

Resumo

Objetivo: verificar a prevalência dos achados clínicos autorrelatados em professores confirmados com COVID-19 no estado de Minas Gerais, Brasil. **Materiais e Métodos:** estudo observacional realizado em população composta por professores que vivem no estado de Minas Gerais. A coleta de dados ocorreu entre 20 de agosto e 11 de setembro de 2020 por meio de formulário online confeccionado na plataforma *Google Forms*. Foram investigados sinais e sintomas da COVID-19 autorreferidos, como: febre, tosse seca, tosse com secreção, calafrios, dor de garganta, fadiga ou cansaço, coriza, falta de ar, congestão nasal, cefaleia, ageusia e anosmia, náuseas ou vômitos, diarreia, dores nas articulações e dores musculares. **Resultados:** foram recebidos 15.641 formulários de respostas, que evidenciaram 181 professores confirmados com COVID-19, dentre os quais 69,6% apresentaram cefaleia, 63,5% ageusia e anosmia, 52,5% tosse seca, 49,2% fadiga ou cansaço. **Conclusão:** os sinais e sintomas mais prevalentes autorrelatados por professores com diagnóstico positivo para COVID-19 mostram-se relevantes para a suspeição e consequente realização de testes diagnósticos.

Palavras-chave: Prevalência. Sinais e sintomas. COVID-19. Professores escolares.

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Received in: 03/05/2023. **Approved in:** 08/08/2023. **How to cite this article:** Eloy VRS, Eloy MRS, Silva NSS, Magalhães TA, Haikal DS, Rossi-Barbosa LAR. Prevalence of Signs and Symptoms of COVID-19 Self-reported by Teachers in Minas Gerais. *Revista Bionorte*. 2023 jul-dez;12(2):374-82. <https://doi.org/10.47822/bn.v12i2.683>



Introduction

The new coronavirus emerged in December 2019 in Wuhan, China, and brought, abruptly and comprehensively, the enveloped RNA virus that causes infection in humans. After the discovery of the new etiological agent, the number of contaminated people increased nationally and internationally, until, in March 2020, the World Health Organization (WHO) considered the disease as pandemic¹. The manifestations are mainly upper or lower respiratory tract, but also with enteric, hepatic and neurological repercussion².

The main source of propagation, with high rates of transmission of the etiological agent, were respiratory secretions, which increases in case of the elderly, immunocompromised, diabetic, cardiopathic or hypertensive². Studies with confirmed cases state that the elimination of the virus is greater in the respiratory tract in the three days after the onset of symptoms³.

The clinical picture of the initial disease varies from mild to severe acute respiratory syndrome⁴. Among the laboratory confirmed patients with SARS-Cov-2 infection, the most common findings in the early stage of the disease were fever, cough and myalgia or fatigue. Other relevant findings were dyspnea, expectoration, headache, hemoptysis and diarrhea⁵. Elderly and immunocompromised individuals may present atypical clinical conditions, with abrupt worsening, especially in the face of pre-existing comorbidities⁶.

The similarity of COVID-19 with other viral respiratory infections contributes to the need to make the differential diagnosis, although, in most cases, the definitive differentiation is made by the diagnostic test by RT-PCR or serological examination. Nasal congestion, tearing, sneezing and runny nose are not typically characteristic in the pandemic. However, a variety of symptoms are observed in studies conducted thus far, such as nausea and vomiting. Fatigue, diarrhea, abdominal distension, odynophagia and chills were other findings, although less common⁷.

The impossibility of detecting COVID-19 in early stages is worrisome, especially among those at higher risk: over 60 years of age, with obesity, hypertension, diabetes mellitus and lung problems⁵. It is important to know the main clinical findings of COVID-19, since they determine the suspicion of cases and point to the performance of necessary differential diagnoses.

The aim of this study was to verify the prevalence of the main self-reported clinical findings in individuals confirmed with COVID-19.

Material and Methods

An observational cross-sectional study, with quantitative data analysis, was conducted. The study population consisted of teachers who worked in early childhood, elementary and high school education in state schools in the state of Minas Gerais, Brazil. The state has about 3,500 state schools and about 90,000 teachers. Sample calculation was performed considering a prevalence of 50% to obtain a larger sample size and greater inference power for different variables.

The list of state schools in the state with the number of teachers was made available by the State Department of Education of Minas Gerais and sought to ensure the representation of teachers for each of the 45 departments in the state. The sample included regent teachers in early childhood education and/or elementary and/or high school in the year 2020.

After the authorizations granted by the Department of Education, the data collection began, which occurred between August 20 and September 11, 2020 from an online form available to participants through the Google Forms platform. The digital form contained the Informed Consent Form duly signed by the research coordinator and with the possibility for participants to print or make a print, if wanted. Subsequently, there was a question as to whether or not they agreed to participate in the survey. According to data from the pilot study conducted with 20 individuals, filling out the form consumed about 25 minutes.

Data related to the participants' profile (sex, age, marital status, self-reported skin color, family income) and smoking habits were investigated. There was a research about 15 self-reported COVID-19 clinical findings, dichotomized into yes and no: fever, dry cough, cough with discharge, chills, sore throat, fatigue or tiredness, runny nose, shortness of breath, nasal congestion, headache, ageusia and anosmia, nausea or vomiting, diarrhea, joint and muscle pain.

All data tabulation, systematization and analysis procedures took place with exclusive use of codes assigned to each form received. The data obtained were transferred and analyzed in the software Statistical Package for the Social Sciences (SPSS) version 20.0 for Windows®.

Ethical care

The project was submitted to the Research Ethics Committee of the State University of Montes Claros – (Unimontes), with consubstantiated opinion n. 4.200.389. The research complied with resolutions 466/12 and 510/16 of the National Health Council/Ministry of Health, which regulates research involving human beings.

Results

There was the collection of 16,066 forms. Of these, 455 were excluded from the study, since they were not in the position of teacher, being considered eligible 15,641 from 795 among the 853 municipalities of Minas Gerais. Most teachers were female (81.9%), aged between 21 and 77 years, with a mean age of 42.96 years ($SD \pm 9.267$), with the majority in the age group between 40 and 59 years (59.1%). Most had a partner (66.8%), 48.9% self-reported white and 5.5% smoked. Before the beginning of the pandemic, most had family income between three and five wages (59.5%).

Among the 15,641 teachers, 6,329 (40.5%) had one or more of the 15 clinical findings during the pandemic, the most prevalent being: headache (67.8%), runny nose (43.7%), nasal congestion (36.2%), sore throat (34.4%). Of these 6,329 teachers, 6.8% were tested for COVID-19 and the most prevalent findings were: headache (48.2%), runny nose (32.3%), dry cough (31.2%) and sore throat (29.5%).

The test for COVID-19, among those who answered about the result, was positive for 1.2% ($n=181$) of the teachers; 33% had not received the result and the others reported negative test. These 181 teachers were aged between 24 and 65 years ($mean=42$; $SD=9.418$). The profile of these teachers is shown in Table 1 and the most prevalent clinical findings, in Table 2.

Table 1 – Sociodemographic, economic and smoking characterization of teachers confirmed with Covid-19. Minas Gerais, Brazil, 2020. ($n=181$).

Variables	n	%
Sex		
Female	160	88.4
Male	21	11.6
Age group		
24 - 40	74	40.9
41 - 60	102	56.4
> 60	5	2.8
Marital status		
With partner	138	76.2
Without partner	43	23.8
Skin color		
White	82	45.3
Brown	87	48.1
Black	8	4.4
Yellow	4	2.2
Smoking		
Non-smoker	167	92.3
Smoker	8	4.4
Ex-smoker	6	3.3

Family income before the pandemic

1 - 2 wages	28	15.6
3 - 5 wages	110	60.8
6 - 9 wages	32	17.7
10 or more wages	11	6.1

Table 2 - Clinical findings self-reported by teachers confirmed with Covid-19. Minas Gerais, Brazil, 2020. (n=181).

Sign or symptoms	n	%
Headache	126	69.6
Ageusia and/or anosmia	115	63.5
Dry cough	95	52.5
Fatigue or tiredness	89	49.2
Diarrhea	83	45.9
Muscle aches	80	44.2
Nasal congestion	75	41.4
Chills	74	40.9
Sore throat	73	40.3
Fever	70	38.7
Runny nose	68	37.6
Joint pain	55	30.4
Nausea or vomiting	45	24.9
Shortness of breathe	45	24.9
Cough with phlegm	15	8.3

Among the teachers who tested positive for COVID-19, 12 reported that they required hospitalization, and, of the 15 findings listed, nine teachers had six or more of them, with prevalence of headache, loss of smell or taste, fever, chills, shortness of breath and diarrhea.

Discussion

At the beginning of the COVID-19 pandemic in China, fever occurred in most confirmed-in-laboratory cases, present in 98% of patients, cough in 76%, and myalgia or fatigue, in 44% as initial symptoms of the disease⁵. In the present study, fever and dry cough had a low prevalence; fatigue showed similarity with the results of the Chinese study. In this study, concrete temperatures were not considered for the definition of fever, contrasting with that in which fever was defined with parameters, including variations in temperatures within the clinic⁵.

The indication of the World Health Organization (WHO) to determine the disease takes into account, without order of prevalence, fatigue, mild dyspnea, anorexia, body pain, headache or nasal congestion⁴. There is therefore some similarity with the results obtained in this investigation. In fact,

headache and fatigue made up an expressive part of the clinical picture analyzed and nasal congestion was also a present sign. Although there are coincident facts, dyspnea was not prevalent in this study.

Gastrointestinal symptoms, such as diarrhea, nausea and vomiting, were focus of WHO, not as frequent symptoms, but as possible in confirmed patients⁴. Diarrhea, in this study, was the most common gastrointestinal sign, ranked fifth in order of prevalence of confirmed cases, followed by nausea and vomiting.

Respiratory difficulties make up the severe form of the disease, consisting of severe acute respiratory syndrome, in which dyspnea and discomfort or pressure in the chest and oxygen saturation below 95% in ambient air, with or without central cyanosis, are typically found⁸. Parallel to the present study, most of the less severe forms of COVID-19 are confirmed, since the clinic of severe acute respiratory syndrome does not comprise the most significant within the population.

The main finding of the present study was headache, which was important for COVID-19 research. A similar result was observed in a study that categorized Chinese bibliographies, in which headache was found in 76.9% of cases in a population aged 35 to 57 years⁹. A systematic review¹⁰ also reported the presence of headache as a neurological manifestation due to COVID-19, being, thus, the most reported sign among the most common sensorineural impairments. Other conditions have also been reported, such as Guillain-Barré syndrome and olfactory and gustatory dysfunction. One of the analyzed studies¹¹, from Wuhan, China, showed that more than one third of the patients studied had some neurological involvement and that 17% of these patients corresponded to headache.

Otorhinolaryngological and neurological findings are strongly related to COVID-19¹². Olfactory dysfunction is a prevalent symptom and may vary according to the clinical picture presented, being better investigated in mild cases of the disease¹³. A study¹² carried out in European hospitals showed that olfactory dysfunction occurred after other symptoms and, in most cases, disappeared within one month of its beginning¹². Initially, the hypotheses for ageusia and anosmia involve congestion of the olfactory cleft in the short term, neuroepithelial lesion and viral dissemination to the olfactory bulb in medium to long term¹². In this study, otorhinolaryngological disorders also gained evidence, ranking second in order of prevalence.

Dry cough was present in more than half of the teachers surveyed. The relevance of cough occurs for two reasons in this study: a) it is in third place among the clinical findings described as the object of the research among patients with the confirmed diagnosis of COVID-19; b) it has particular importance because it is characterized as a sign related to the transmission of the disease, since patients are the main sources of spread by the production of large amounts of viruses in the upper

respiratory tract and, with this, transmission can occur through contact with respiratory droplets and aerosols, which are closely related to cough, even without expectoration^{9,14}.

Fatigue is one of the most common symptoms in patients with COVID-19¹⁴. In addition to being present in the current conditions of infection, some studies have shown that its development can continue in a post-viral fatigue syndrome^{15,16}, being demonstrated in a Brazilian study, in which 57.2% (n=584) of the sample showed persistence of fatigue after COVID¹⁴.

A limitation of the research concerns the varied perception of clinical findings, such as the subjectivity of temperatures listed as fever by the interviewees, since the measurement of the exact temperature was not questioned in the form. These factors are, in a way, important in the impact of the study for the medical society and community in general. Moreover, the specification of the confirmatory laboratory test is relevant to determine the diagnosis of the disease. Nevertheless, the analysis of the most frequent clinical findings in the disease is relevant, since the laboratory tests depend on the diagnostic suspicion, and the isolation of the suspected case can be done since then.

Conclusion

COVID-19 results in a variable clinical picture, in which clinical findings may or may not be present in different profiles of individuals. The most prevalent clinical findings in teachers who had a confirmed diagnosis were headache, ageusia and anosmia, dry cough and fatigue or tiredness. In this sense, they are relevant to the suspicion and consequent performance of diagnostic tests.

Acknowledgment

Scientific Initiation Program PROCIÊNCIA at the University Center of Norte de Minas. This work was carried out through the Postgraduate Program in Primary Health Care Postgraduate Program in Primary Health Care at the State University of Montes Claros - UNIMONTES, Montes Claros, Minas Gerais, Brazil.

Authors' contributions

The authors approved the final version of the manuscript and self-declared responsible for all aspects of the work, including ensuring its accuracy and completeness.

Conflict of interest

The authors declare that there are no conflicts of interest.

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