DOI 10.18471/rbe.v37.48589 Original article

PREVALENCE OF COVID-19 AND ASSOCIATED FACTORS AMONG PUBLIC WORKERS

PREVALÊNCIA DE COVID-19 E FATORES ASSOCIADOS ENTRE SERVIDORES PÚBLICOS

PREVALENCIA DE COVID-19 Y FACTORES ASOCIADOS ENTRE SERVIDORES PÚBLICOS

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How to cite this article: Ramalho JAA, Brasil MHF, Dantas ARA, Oliveira RASC, Nogueira WP, Pereira IL, et al. Prevalence of Covid-19 and associated factors among public workers. Rev baiana enferm. 2023;37:e48589.

Objective: to identify the prevalence of Covid-19 and associated factors among public workers in the city of João Pessoa, Paraíba. Method: cross-sectional, analytical study, conducted with 373 workers in João Pessoa, Paraíba. Information from the state's Health Surveillance portal on the evolution of Covid-19 was used. The study population were public workers who performed the RT-PCR test for Covid-19 between April and June 2021. Descriptive and inferential statistics were performed. Results: prevalence of Covid-19 was 19.8%; female gender has reduced chances to present a positive diagnosis of the disease; anosmia was associated with the diagnosis of the referred infection. Conclusion: availability of personal protective equipment, measures for hand hygiene, stimulation of vaccination and reorganization of space are some of the strategies for ensuring the safety of workers in the work environment.

Descriptors: COVID-19. COVID-19 Testing. Occupational Health. Public Health. Disease Prevention.

Objetivo: identificar a prevalência da Covid-19 e fatores associados entre servidores públicos do município de João Pessoa, Paraíba. Método: estudo transversal, analítico, realizado com 373 servidores de João Pessoa, Paraíba. Utilizou-se informações do portal de Vigilância em Saúde do estado sobre a evolução da Covid-19. A população do estudo foram os servidores públicos que realizaram o teste RT-PCR para a Covid-19 entre abril e junho de 2021. Realizou-se estatística descritiva e inferencial. Resultados: prevalência de Covid-19 foi de 19,8%; sexo feminino tem chances reduzidas para apresentar diagnóstico positivo da doença; anosmia esteve associada com o diagnóstico da referida infecção. Conclusão: disponibilidade de equipamentos de proteção individual, medidas para higienização das mãos,

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estímulo à vacinação e reorganização do espaço são algumas das estratégias para a garantia da segurança dos trabalhadores no ambiente de trabalho.

Descritores: COVID-19. Teste para COVID-19. Saúde Ocupacional. Saúde Pública. Prevenção de Doenças.

Objetivo: identificar la prevalencia de la Covid-19 y factores asociados entre servidores públicos del municipio de João Pessoa, Paraíba. Método: estudio transversal, analítico, realizado con 373 servidores de João Pessoa, Paraíba. Se utilizó información del portal de Vigilancia en Salud del estado sobre la evolución de Covid-19. La población del estudio fueron los funcionarios públicos que realizaron la prueba RT-PCR para Covid-19 entre abril y junio de 2021. Se realizó estadística descriptiva e inferencial. Resultados: prevalencia de Covid-19 fue de 19,8%; sexo femenino tiene probabilidades reducidas para presentar diagnóstico positivo de la enfermedad; anosmia estuvo asociada con el diagnóstico de dicha infección. Conclusión: disponibilidad de equipos de protección individual, medidas para higienización de las manos, estímulo a la vacunación y reorganización del espacio son algunas de las estrategias para la garantía de la seguridad de los trabajadores en el ambiente de trabajo.

Descriptores: COVID-19. Prueba de COVID-19. Salud Laboral. Salud Pública. Prevención de Enfermedades.

Introduction

The new Coronavirus pandemic, known mainly as Covid-19, was decreed by the World Health Organization (WHO) in March 2020. In mid-February 2022, 434,154,739 and 5,944,342 numbers of cases and deaths were reported in the world, respectively. Brazil has approximately 8% of world cases and 11% of deaths[1].

Transmission of SARS-CoV-2 occurs predominantly through respiratory droplets expelled during speech, coughing and sneezing. A study reveals that there is considerable contagion in the pre-symptomatic or symptomatic phases, since there is a significant increase in the viral load in the body of individuals[2].

The most frequent symptoms presented by individuals diagnosed with the new Coronavirus infection are fever and cough, concomitantly with changes in chest imaging tests. Moreover, the literature shows records of less common symptoms such as dyspnea, runny nose, fatigue, headache, myalgia, sore throat, diarrhea, nausea and vomiting[3].

Early diagnosis is essential for the interruption of the virus transmission chain. In this way, the provision and accomplishment of diagnostic methods for Covid-19 is an important strategy, as they allow an efficient monitoring of the progression of cases, with the isolation of infected individuals, screening of contracting individuals and, consequently, a reduction of the epidemic curve[4].

According to scientific evidence, the examination that has greater accuracy (gold standard) for diagnosis of Covid-19 is the detection of the viral sequence by polymerase chain reaction with reverse transcriptase (RT-PCR), with sample collected by nasal and pharyngeal swab. Such test should be performed in the acute phase of the disease, in the first seven days after the onset of symptoms[5-6].

The use of masks, hand hygiene and physical distancing have also become essential non-pharmacological strategies to mitigate viral transmission in the population, along with vaccination, especially within the workplace. Then, importantly, working conditions are fundamental to prevent the spread of the virus within services[7].

The working conditions of health professionals gained prominence during the pandemic; however, it was not possible to visualize the same concern with the other professional categories, such as safety and management. Thus, the worker, not only for the actions related to his/her occupation, but also for the workplace, has a potential risk of contamination by the virus[8].

A study conducted in the Czech Republic revealed that, when analyzing 732,202 cases of Covid-19, 64,587 (9.0%) were classified

as an occupational disease. Concerning the prevalence among professions, health, social service, administration, security and banking workers prevailed[9]. Research in Italy with workers in general (not including those in the health sector) showed that there was a significant association between positive cases and the "police" profession[10].

In view of the above, it is evident that the various professions are exposed to the new coronavirus in their work environment. Therefore, it is necessary to expand the studies on the impact of Covid-19 on workers' health in different regional contexts. Thus, the objective of this research is to identify the prevalence of Covid-19 and associated factors among public workers in the city of João Pessoa, Paraíba.

Method

Cross-sectional, analytical study with a quantitative approach, conducted with public workers in the city of João Pessoa, in the state of Paraíba. Information from the Health Surveillance portal of the state of Paraíba on reported cases of Covid-19 was used[11]. The information was collected in July 2021.

The study population was composed of state public workers who performed the RT-PCR test for diagnosis of Covid-19 in the period from April to June 2021. Individuals of both sexes, aged 18 years or older, with proven employment in the state and who performed the aforementioned test were included. Cases with inconclusive results were excluded. The final sample consisted of 373 public workers who performed the test.

The data were organized in a Microsoft Excel spreadsheet and imported into the Statistical Package for the Social Sciences (SPSS) program, version 20 for Windows, to perform descriptive and inferential statistical analyses. Variables with incomplete information (unknown or blank data) above 20% were excluded. As for incomplete information, a bank is considered excellent when there is less than 5% of incomplete information, good from 5% to 10%, regular from 10% to 20%, poor from 20% to 50% and very poor, more than 50%[12].

The descriptive analysis was performed using absolute, relative, mean and standard deviation frequencies. The prevalence of Covid-19 diagnosis, according to RT-PCR positivity, was calculated considering a 95% confidence interval (95%CI). The positive diagnosis of Covid-19 was considered as the dependent variable. The sociodemographic variables (sex and age group) and those related to Covid-19 (time of onset of symptoms and performance of the test, presence of fever, cough, dyspnea, headache, anosmia and ageusia) were considered as independent variables.

To investigate the association between the variables, the Chi-square test and the Fisher's exact test were first used. To estimate the odds ratio, the variables that presented p-value $p<0.20$ were included in a logistic regression model. The variables with p-values of $p\leq0.05$ were considered statistically significant associations.

The research was not submitted to the Research Ethics Committee (REC), since secondary data from the public domain were used, as stated by Resolution n. 510/2016 of the National Health Council (NHC)[13].

Results

The study included 373 public workers in the state of Paraíba. Most men (200; 56.6%), aged 35 to 59 years (213; 57.1%), with a mean age of 39.7 (SD=11.2). As for the sector of operation, most were management workers (233; 62.5%). The most frequent symptom of Covid-19 was headache (194; 52.0%) (Table 1).

Table 1 – Sociodemographic and clinical characteristics of workers. João Pessoa, Paraíba, Brazil – 2021. (N=373)

Variables	n	%
Sex		
Male	200	56.6
Female	173	43.4
Age group		
18-34	143	38.3
35-59	213	57.1
≥60	17	4.6
Occupation		
Health worker	34	9.1
Security worker	106	28.4
Management worker	233	62.5
Covid-19 symptoms		
Headache	194	52.0
Sore throat	159	42.6
Fever	142	38.1
Myalgia	141	37.8
Cough	137	36.7
Runny nose	134	35.9

Source: created by the authors.

Table 2 shows the association between the diagnosis of Covid-19 and the sociodemographic characteristics of the workers.

Table 2 – Association between the diagnosis of Covid-19 and sociodemographic characteristics of workers. João Pessoa, Paraíba, Brazil – 2021. (N=373)

Variables	Diagnosis of Covid-19		
	No (n = 299) n (%)	Yes (n=74) n (%)	p-value
Sex			0.057
Male	153 (76.5)	47 (23.5)	
Female	146 (84.4)	27 (15.6)	
Age group (years)			0.606
18-34	116 (81.1)	27 (18.9)	
35-59	168 (78.9)	45 (21.1)	
≥60	15 (88.2)	2 (11.8)	
Occupation			0.166
Health worker	30 (88.2)	4 (11.8)	
Security worker	89 (84.0)	17 (16.0)	
Management worker	180 (77.3)	53 (22.7)	

Source: created by the authors.

The prevalence for diagnosis of Covid-19, according to RT-PCR positivity, was 19.8% (95% CI: 15.4-24.2). In the association between the diagnosis of Covid-19 and the clinical characteristics of infection in workers, the presence of olfactory alteration (anosmia) was associated with the diagnosis of this infection (Table 3).

Table 3 – Association between the diagnosis of Covid-19 and clinical characteristics of workers. João Pessoa, Paraíba, Brazil – 2021. (N=373)

Variables	Diagnosis of Covid-19		
	No (n=299) n (%)	Yes (n=74) n (%)	p-value
Time between the onset of symptoms and the test			0.535
Up to 7 days	266 (79)	69 (20.6)	
8 or more days	29 (85.3)	5 (14.7)	
Asymptomatic	4 (100.0)	-	
Fever			0.068
Yes	107 (75.4)	35 (24.6)	
No	192 (83.1)	39 (16.9)	
Dyspnea			0.266
Yes	8 (66.7)	4 (33.3)	
No	291 (80.6)	70 (19.4)	
Cough			0.825
Yes	109 (79.6)	28 (20.4)	
No	190 (80.5)	46 (19.5)	
Headache			0.899
Yes	156 (80.4)	38 (19.6)	
No	143 (79.9)	36 (20.1)	
Olfactory alteration (anosmia)			**<0.001**
Yes	9 (42.9)	12 (57.1)	
No	290 (82.4)	62 (17.6)	
Taste alteration (ageusia)			0.143
Yes	4 (57.1)	3 (43.9)	
No	295 (80.6)	71 (19.4)	

Source: created by the authors.

Note: Conventional sign used:
- Numeric data equal to zero not resulting from rounding.

The logistic regression showed that female workers have reduced chances to present a positive diagnosis for Covid-19, and those who presented olfactory alterations (anosmia) as symptom are approximately seven times more likely to present a diagnosis of the disease (Table 4).

Table 4 – Odds ratios for diagnosis of Covid-19 among workers. João Pessoa, Paraíba, Brazil – 2021. (N=373)

(continued)

Variables	Diagnosis of Covid-19			
	Gross Odds Ratio (95% Confidence Interval)	p-value	Adjusted Odds Ratio (95% Confidence Interval)	p-value
Sex				
Male	1		1	
Female	0.60 (0.35-1.01)	0.058	0.56 (0.32-0.97)	0.040(1)

Table 4 – Odds ratios for diagnosis of Covid-19 among workers. João Pessoa, Paraíba, Brazil – 2021. (N=373) (conclusion)

Variables	Diagnosis of Covid-19			
	Gross Odds Ratio (95% Confidence Interval)	p-value	Adjusted Odds Ratio (95% Confidence Interval)	p-value
Fever				
Yes	0.62 (0.37-1.03)	0.069	0.60 (0.35-1.03)	0.066
No	1		1	
Olfactory alterations (anosmia)				
Yes	6.23 (2.51-15.4)	<0.001*	7.23 (2.85-18.3)	<0.001(1)
No	1		1	

Source: Created by the authors.

(1) p≤0.05.

Discussion

The Covid-19 infection affected many workers in the exercise of their function. Due to the high spread of the virus, several changes had to be made in the work environments, such as: adequate supply of Personal Protection Equipment (PPE), awareness for the adoption of preventive measures, interventions for work safety and vaccine card request. Despite the changes, the prevalence of Covid-19 among workers is still increasing[14].

The city of João Pessoa (capital of Paraíba) presented 179,465 positive cases of the disease, with an incidence of 21.7% and lethality rate of 1.84%[11]. In this study, there was a prevalence of 19.8% (95% CI: 15.4-24.2) for the diagnosis of Covid-19 among the city's public workers. Research carried out in Kosovo, a country located in southeastern Europe, obtained a prevalence of Covid-19 in municipal workers similar to this study[15]. A similar result was found in eight public administration service facilities in Geneva, Switzerland[16]. Such investigations show the importance of building and strengthening public health policies directed to the workers, since this population is highly exposed to contact with the general public.

Moreover, female public workers presented reduced chances for diagnosis of infection. Research reveals that susceptibility to viral infections is reduced in women due to sex hormones that play an important role in the development of innate and adaptive immunity[17]. Furthermore, historically, men tend to seek health services less frequently, only in more severe situations, which directly influences the prognosis of the disease[18].

A study with 47,184 Brazilian citizens showed that female individuals have greater adherence to the preventive measure of physical isolation when compared to males[19]. Corroborating this data, a research conducted in the United States of America (USA) revealed that women were less likely to receive a positive diagnosis of Covid-19, as well as having greater knowledge about the pandemic disease and adopting more frequently appropriate behaviors for its prevention[20].

The most frequent symptoms were headache, sore throat and fever. Chinese research showed that most patients were admitted with fever[21]. In Chile, outpatients complained of headache and sore throat[22]. Although most clinical manifestations are respiratory, it is essential to evaluate atypical symptoms in patients seeking health care, providing a broader knowledge about Covid-19[23].

In this study, the presence of anosmia was associated with the diagnosis of infection, in which workers who presented anosmia as a symptom were seven times more likely to have a diagnosis of Covid-19. A Mexican research

also found a statistically significant association between anosmia and the positive result for this disease. It is noteworthy that the prevalence of this symptom occurred mainly in individuals with IGM+, which indicates that the presence is relatively higher in the active phase of the disease[24].

In this context, the literature indicates that anosmia is related to edema in the bilateral olfactory bulb, caused by infection of the new coronavirus. Therefore, health professionals must identify the presence of this symptom in screening, since research shows that there is a strong association with Covid-19[25].

As a limitation of the study, it is important to consider that it was carried out in the context of a single city, with a time cut of three months. However, its importance is emphasized, since it addresses an essential theme in pandemic times, which is workers' health. Thus, other studies should be developed and executed in other regions of the country, covering a larger sample of workers, in different social contexts.

Conclusion

The prevalence of Covid-19 among public workers was 19.8%. Among the associated factors, female public workers have reduced chances to present a positive diagnosis for Covid-19, and those who reported anosmia as one of the symptoms presented higher chances of presenting a positive result for the infection.

Considering the exposure to the new coronavirus during work, it is essential to adopt and expand safe strategies in the workplace. Availability of PPE, easy access to measures for hand hygiene and reorganization of the workspace are some of the main strategies to ensure the safety of these workers in their work environment. In addition, guidance and encouragement for vaccination should also be part of safe strategies for safe resumption to work.

Collaborations:

1 – conception and planning of the project: Joanna Angelica Araujo Ramalho, Maria Hellena Ferreira Brasil, Ivoneide Lucena Pereira, Wynne Pereira Nogueira and Ana Cristina de Oliveira e Silva;

2 – analysis and interpretation of data: Joanna Angelica Araujo Ramalho, Maria Hellena Ferreira Brasil, Wynne Pereira Nogueira and Ana Cristina de Oliveira e Silva;

3 – writing and/or critical review: Joanna Angelica Araujo Ramalho, Maria Hellena Ferreira Brasil, Alison Rener Araújo Dantas, Regiane Aparecida da Silva Coelho e Oliveira, Wynne Pereira Nogueira, Ivoneide Lucena Pereira and Ana Cristina de Oliveira e Silva;

4 – approval of the final version: Joanna Angelica Araujo Ramalho, Maria Hellena Ferreira Brasil, Alison Rener Araújo Dantas, Regiane Aparecida da Silva Coelho e Oliveira, Wynne Pereira Nogueira, Ivoneide Lucena Pereira and Ana Cristina de Oliveira e Silva.

Competing interests

There are no competing interests.

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Received: March 23, 2022

Approved: August 08, 2023

Published: September 27, 2023

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