Article

Assessment of the Presence of Symptoms, Individual Protection Measures (IPM) and Suspect Screening Measures (SSM) of COVID-19 in Federal Police Officers from a Regional Police Station in Brazil

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Abstract: The coronavirus of severe acute respiratory syndrome 2 (SARS-CoV-2), known as COVID-19, has spread rapidly around the world, leading to social detachment and the home office replacing face-to-face work. The performance of police officers faces limitations to the new requirements, while recognizing the need to ensure health and quality of life. Thus, the present study aimed to verify the panorama of the spread of COVID-19 among federal police officers by analyzing the presence of symptoms, individual protection measures (IPM), suspect screening measures (SSM) and examination for total antibodies (IgA, IgG and IgM). For this, data were collected through a questionnaire customized for this situation, blood for serological testing and measurements of clinical data from 56 federal police officers in the municipality of Marília (São Paulo, Brazil). There was no positive result in the Anti-SARS-CoV-2 serological test in any sample participant. The mean value of the Body Mass Index (27.2 ± 5.4 kg / m2) suggests overweight and obesity, in addition to the presence of hypertension in 16.1%, diabetes in 3.6%, asthma in 3.6 % and obesity by 25%, which represents an important risk of complications for COVID-19. The use of a mask is the most frequent IPM (96.4%) and most of the sample has used

a cloth or home mask (90.9%). However, 47.3% have not performed the correct cleaning of the masks and 5.5% have not taken any care with mask hygiene. It can be concluded that care in relation to the professional activities of federal police to date has prevented the spread of SARS-CoV-2 and that they must be maintained or increased because risk factors, which involve quality of life and worsening of the contamination condition, were detected in the participants.

Keywords: covid-19 antibody; coronavirus; immunoglobulin; police officer; quality of life; SARS-CoV-2

1. Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), known as COVID-19, had its first case reported in December 2019 [1] and has among its main characteristics that of causing an acute infection that can result, in particular, in extremely severe respiratory infections, accompanied by secretions [2].

Its rapid spread around the world resulted in the pandemic state being declared by the World Health Organization on 03/11/2020 [3], which was followed in Brazil by the enactment of Law no. 13,979 / 2020 [4], which allowed the imposition of restrictions on several fundamental rights, in particular, with the introduction of quarantine, isolation and social distance institutes in the Brazilian legal scene. In addition, Federal Decree no. 10,282 / 2020 [5], by regulating the referred Law, established the activities considered essential, among which included "public and private security activities, including surveillance, custody and custody of prisoners" (art 3, § 1, subsection III).

In the scope of the public service, at all levels and spheres of government and, also, in the private initiative, one of the consequences of the referred law and of the decrees that regulated it was the imposition of telework, home office or online work, in substitution of face-to-face work. This imposition of teleworking, in some cases and apparently, occurred to the detriment of the activities performed by some agencies, among which the State's police activities can be included. After all, the performance of the judicial police faces great material limitations when performed through telecommuting without acting in the field [6].

Thus, on the one hand, there is the importance of activities developed within the scope of Public Security and, on the other, the need to guarantee the health and life of police officers, topics of great importance that, however, have few studies worldwide [7–9]. On the other hand, in order to ensure that essential services are not paralyzed, measures were taken to test the professionals involved in such services. This practice, however, was limited to those who showed symptoms of COVID-19, including police officers [10].

Such conduct, however, ends up eliminating from the eligible to be tested all the possibly contaminated police officers who are asymptomatic, imposing a limitation on their activity that would be unnecessary if it were proven that they already had the production of antibodies. In addition, initial data from the Ministry of Justice and Public Security of Brazil, as well as from the State Public Security Secretariats, indicate an increase in crime during the pandemic [11].

From the above, thinking about quality of life, the present research aimed to analyze the presence of symptoms, individual protection measures (IPM), suspect screening measures (SSM) in federal police officers, as well as the analysis of quantitative data of body mass index (BMI) , blood pressure (BP), O2 saturation, temperature, heart rate (HR) and total antibodies.

2. Materials and Methods

2.1. Study Design and Ethical Approval

The present is a cross-sectional, quantitative and analytical study in which 56 federal police officers participated, who work at the Federal Police Station in the municipality of Marília (São Paulo, Brazil). The present study was approved by the Research Ethics Committee of the University of Marília (CEP - UNIMAR) under opinion no. 4,126,024 of 06/30/2020. An invitation was sent to the participants with an explanation of the objectives of the study, as well as the procedures to be performed.

2.2. Study Participants and Research Development

As inclusion criteria, the federal police and other employees who work at the Federal Police Station in Marília participated in the present study, as long as they expressed their acceptance to participate in the study by signing the informed consent form. Exclusion criteria were those who were absent from work on the day of data collection because they were on vacation, outside work or on sick leave due to health problems.

From this invitation, those who agreed to take part in the survey were instructed to access the Google Forms link to complete the Informed Consent Form (ICF) and complete a questionnaire (Figure S1 - Supplementary file). This questionnaire consisted of questions about gender and age, in addition to referred weight and height, from which the body mass index (BMI) was calculated to check for the existence of overweight or obesity, factors that constitute risk factors for COVID -19. BMI was calculated according to the Quetelet formula, in which the individual's weight (Kg) is divided by his height (m) squared [12]. This data was evaluated based on the cutoff points recommended by the World Health Organization (WHO).

This stage lasted for five days, enough time for the participants to have the opportunity to access the online form and complete the instruments. Next, a date was scheduled, according to the availability of the participants, in which the blood collection was performed to perform serology in order to first identify the possible presence of total antibodies (immunoglobulins) and, in a complementary way, IgG positive for SARS-CoV-2 for those positive on the primary exam. Thinking about the protection, comfort and safety of the study participants, blood was collected for the exam in a private room at the Federal Police headquarters in Marília. Such collection was performed by professionals from the São Francisco Laboratory of the Municipality of Marília (http://www.laboratoriosaofrancisco.com/), who were responsible for the examinations, as well as for the transport and storage of the material. It is worth mentioning that these professionals were using Personal Protective Equipment (PPE).

The collection was performed through venipuncture, using the vacuum collection system using a 25x7 mm needle (Greiner Bio-One®, Americana, SP, Brazil) and tubes with clot activator and separator gel of the same brand. After collection, the tubes with the material were subjected to centrifugation for 10 minutes at 3.500 revolutions per minute to obtain the serum that was used in the test.

After the exams were carried out, the samples were stored in a refrigerator with a temperature of 2 to 8 ° C for a period of 7 days, after which the samples were discarded following the PGRSS (Waste Management Program in Waste Management Services). Health) as per the ANVISA (National Health Surveillance Agency, Brazil) resolution.

For serology exams, the total antibody test (IgA, IgG and IgM) was initially performed by electroluminescence. The examination was performed by the Elecsys® Anti-SARS-CoV-2 test, which is an immunoassay for the qualitative detection of antibodies (including IgG) against SARS-CoV-2 in human serum and plasma [13].

Participants who eventually tested positive for total antibodies would be tested for antibodies with the Abbott SARS-CoV-2 IgG assay (Abbott Diagnostics®, Chicago, USA). SARS-CoV-2 IgG is a microparticle chemiluminescent immunoassay (CMIA) for the qualitative detection of IgG antibodies for SARS-CoV-2 in human serum [14,15].

At the time of blood collection, measurements of body temperature, blood pressure and O2 saturation were also performed. To measure body temperature, a digital thermometer with an

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infrared sensor (Aicare® Corp, San Jose, CA, USA) was used. This was positioned on the participant's forehead, at a distance of five centimeters, keeping the start button pressed. When the tracking light was activated and the temperature measured, a sound signal was emitted and heard by those responsible for the measurement. Then the start button was released and the temperature expressed in the display of the device registered.

Blood pressure was assessed according to the recommendations of the 7th Brazilian Guideline for Hypertension [16]. An oscillometric technique was used by means of a digital semiautomatic device with a validated and calibrated arm (Omron Brazil®, São Paulo, SP). The measurement was performed with the participant at rest for at least five minutes, with an empty bladder, without having practiced physical exercises for at least 60 minutes, and without drinking alcohol, coffee, food or tobacco in the previous 30 minutes. The participant was also instructed not to talk and move their arm during the measurement.

Participants were seated, legs uncrossed, feet flat on the floor, back against the chair and relaxed. The device was placed on the left arm extended and supported at heart level, free of clothes, supported, with the palm of the hand facing up and the elbow slightly flexed. Blood pressure values were recorded in mmHg, as indicated on the device, without rounding. Two measurements were made with an interval of one minute between them, the average of which was considered the real blood pressure.

O2 saturation, also called oximetry, is a test used to measure the level of oxygen in the blood. This was measured using a pulse oximeter. (JG MORIYA®, São Paulo, SP, Brazil). This tool consisted of a clip-like device that was placed on the participant's index finger, sending two wavelengths of light through the finger to measure his pulse rate and how much oxygen is in his vascular system. Once the oximeter finishes its evaluation, the percentage of oxygen in the blood coming from the heart was displayed on the screen, as well as the current pulse rate, values that were recorded.

All researchers in the present study involved in the face-to-face data collection made use of PPEs according to the recommendations of the World Health Organization. The procedures used in the present research followed the Ethics Criteria in Research with Humans as per resolution no. 466/12 of the National Health Council (Brazil).

The study did not include people who did not accept to answer the research questions in the proposed questionnaire. Data collection was authorized by the Chief Delegate of the Federal Police (Figure S2 - Supplementary file).

As risks of the present research, it can be described that during the collection there is a risk of contamination by COVID-19, which were minimized by the use of personal protective equipment (PPE), according to the recommendations of the Ministry of Health and appropriate techniques for carrying out collection of biological material. Participation in the data collection of the present study generated a minimal risk for the participant. Completing the questionnaire does not include risk or embarrassment, since it was answered online without the presence of the researcher. The risk of biochemical tests are those inherent in any blood test performed throughout life, consisting of small pain in the prick site and local hematoma, which is minimized by the experience of the professional who performed the collection.

As benefits, it is understood that the data collected for the research may contribute to the maintenance of epidemiological surveillance actions and awareness about preventive measures of contamination by COVID-19. The benefits are quite important since they make it possible to verify the correctness of the public policy currently adopted in relation to the testing of police officers, allowing the realization of studies relating the police activity to COVID-19, a rare theme in scientific studies worldwide. In addition, the knowledge of infected individuals will allow adequate conduct to prevent the spread of the virus.

2.3. Primary and Secondary Output

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The primary outcome is characterized by clinical parameters of body temperature, blood pressure and oxygen saturation (SpO2) [17], as well as serological tests for antibodies for SARS-CoV-2 [18]. The secondary outcome is characterized by obtaining information about gender, age, body mass, height, presence of diseases related to risk groups, work regimen, preventive measures, previous testing for COVID-19 and presence of symptoms. This information was obtained through an electronic questionnaire through Google Forms (https://forms.gle/w4mH9kzQQTXNJUka8).

2.4. Data Analysis

Quantitative variables are described by the mean, standard deviation (SD), minimum value (MinV) and maximum value (MaxV). To analyze the effect of gender and obesity on quantitative variables, a two-way Anova was performed based on the homogeneity of the variances and was followed by the Holm-Sidak Post-hoc test for comparisons. Qualitative variables are described by the distribution of absolute (N) and relative (%) frequency. To analyze the differences in the frequency distribution between the response categories, the Chi-square test for proportion was performed considering the null hypothesis of proportional distribution between the categories. The relationship between qualitative variables was analyzed using the Chi-square association test. The level of significance adopted was 5% ($p \leq 0.05$) and the data were analyzed using the SPSS software (version 24.0).

3. Results

The mean BMI value of the sample suggests that part of the sample is overweight and obese, which represents an important risk of complications for COVID-19. The mean O2 saturation (SpO2) was 96.8, which represents a normal but low saturation rate. When analyzing the maximum values of BMI, systolic blood pressure (SBP), diastolic blood pressure (DBP) and HR, it was observed that there are elements in the sample with values above normal that suggest hypertension, resting tachycardia and morbid obesity. On the other hand, the minimum values indicate that there are elements in the sample with O2 saturation below normal and the HR values indicate the presence of bradycardia (Table 1).

Table 1. Sample characteristics in relation to the quantitative variables and correlation with total antibody values for COVID-19.

	N	Mean	SD	MinV	MaxV
Age (years)	56	42.2	9.7	21.0	59.0
Weight (kg)	55	81.7	18.2	49.0	158.0
Height (m)	55	1.73	0.09	1.55	1.90
BMI (kg / m2)	55	27.2	5.4	18.0	47.2
SBP (mmHg)	56	134.3	20.8	110.0	200.0
DBP (mmHg)	56	86.6	12.3	70.0	140.0
T (ºC)	56	36.1	0.5	35.0	37.1
HR (bpm)	56	79.7	14.8	45.0	124.0
SpO2	56	96.8	1.6	91.0	99.0
COI (Anti-SARS-CoV-2)	56	0.070	0.016	0.063	0.178

Note: standard deviation (SD); sample size (N); Cut Off Index (COI) for Anti-SARS-CoV-2.

The sample had a higher proportion of men than women. Regarding risk factors for complications, the presence of hypertension was observed in 16.1%, diabetes in 3.6%, asthma in 3.6% and obesity in 25%. The presence of immunosuppressive diseases, chronic kidney disease (CKD) and chronic obstructive pulmonary disease (COPD) was not observed in the sample. Most of the sample had no changes in the work regime and 32.7% showed a reduction in the workload.

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Only 3.6% (N = 2) of the sample reported having had contact with suspicious persons and those diagnosed with COVID-19, but 100% of the sample tested negative for the total antibody test for Anti-SARS-CoV-2 (Table 2).

Table 2. Distribution of absolute (N) and relative (%) frequency of the sample's characteristics in relation to gender and risk factors for COVID-19 complications.

		N	%	p-value
Gender	Male	39	69.6	0.003*
	Female	17	30.4	
Hypertension	Present	9	16.1	<0.001*
	Absent	47	83.9	
Diabetes	Present	2	3.6	<0.001*
	Absent	54	96.4	
Immunosuppression	Present	0	0.0	-
	Absent	56	100.0	
CKD	Present	0	0.0	-
	Absent	56	100.0	
Asthma	Present	2	3.6	<0.001*
	Absent	54	96.4	
COPD	Present	0	0.0	-
	Absent	56	100.0	
Obesity	Present	14	25.0	<0.001*
	Absent	42	75.0	
Changes in the work regime	Reduced workload	18	32.7	0.001*
	Working normally	37	67.3	
Contact with diagnosed or suspected person	Yes	2	3.6	<0.001*
	No	53	96.4	
Anti-SARS-CoV-2 (COVID-19)	Present	0	0.0	-
	Negative	56	100.0	

Note: * indicates a significant difference in the distribution of the response categories by the Chi-square test for proportion to p-value ≤ 0.05.

In relation to individual protection measures (IPM), the largest proportion of the sample has adopted distance, use of a mask, hand washing and use of alcohol gel. The use of the mask is the most frequent IPM and most of the sample has used a cloth or homemade facial mask. However, 47.3% have notperformed the correct cleaning of the mask and 5.5% have not taken any care with mask hygiene. Another important factor regarding IPM is that practically half of the sample has not taken off their shoes and clothes when they return from the street (Table 3).

In relation to the suspect screening measures (SSM) that should be adopted in the routine of workplaces, it was observed that most of the sample had not carried out any of these suspect-screening measures. Considering that the test has been performed only in the case of symptoms, it would be necessary for the recording of symptoms and clinical parameters such as temperature, blood pressure and O2 saturation to be monitored more frequently. In the sample, it was observed that two sample elements performed the test for COVID-19 prior to the research, but these were not performed in the institution's SST routine (Table 3).

Table 3. Distribution of absolute (N) and relative (%) frequency of adopting individual preventive measures (IPM) and suspect screening measures (SSM) for COVID-19 in the sample.

			N	%	p-value
IPM	Keep the distance between people	Yes	48	85.7	<0.001*

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		No	8	14.3	
	Use of protective mask	Yes	54	96.4	<0.001*
		No	2	3.6	
	Wash hands	Yes	47	83.9	<0.001*
		No	9	16.1	
	Use of alcohol	Yes	54	96.4	<0.001*
		No	2	3.6	
	Take off shoes and clothes outside the home	Yes	23	41.1	0.181
		No	33	58.9	
	Mask type	Disposable	5	9.1	<0.001*
		Homemade / cloth	50	90.9	
	Mask cleaning	Correctly	26	47.3	<0.001*
		Partially	26	47.3	
		Not performing	3	5.5	
SSM	Test for COVID-19	Yes	2	3.6	<0.001*
		No	53	96.4	
	Temperature control	Present	4	7.1	<0.001*
		Absent	52	92.9	
	O2 saturation control	Present	0	0.0	-
		Absent	56	100.0	
	Blood pressure control	Present	0	0.0	-
		Absent	56	100.0	
	Rapid test performance	Present	0	0.0	-
		Absent	56	100.0	
	Symptom recording and survey	Present	11	19.6	<0.001*
		Absent	45	80.4	

Note: * indicates a significant difference in the distribution of the response categories by the Chi-square test for proportion to p-value ≤ 0.05.

The most frequent symptoms in the sample were sore throat and headache. Symptoms of fever, loss of speech or movement and rashes were not observed. The other symptoms occurred, but at a low frequency (Table 4). Although two sample elements performed the test for COVID-19, the research was not carried out in the institution's routine. The sample elements that performed the test prior to the research performed the RT-PCR test in real time in the laboratory with a negative result at 7 and 8 days. Only 2 subjects reported having had contact with people suspected or diagnosed with COVID-19, but these were not the subjects who performed the test for COVID-19 prior to the research.

Table 4. Distribution of absolute (N) and relative (%) symptoms for COVID-19 in the sample.

		N	%	p-value
Fever	Present	0	0.0	-
	Absent	56	100.0	
Dry cough	Present	4	7.1	<0.001*
	Absent	52	92.9	
Tiredness	Present	2	3.6	<0.001*
	Absent	54	96.4	
Pain and discomfort	Present	2	3.6	<0.001*
	Absent	54	96.4	
Sore throat	Present	7	12.5	<0.001*
	Absent	49	87.5	

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Diarrhea	Present	2	3.6	<0.001*
	Absent	54	96.4	
Conjunctivitis	Present	1	1.8	<0.001*
	Absent	55	98.2	
Headache	Present	13	23.2	<0.001*
	Absent	43	76.8	
Loss of taste / smell	Present	1	1.8	<0.001*
	Absent	55	98.2	
Chest pain or pressure	Present	1	1.8	<0.001*
	Absent	55	98.2	
Difficulty breathing or shortness of breath	Present	1	1.8	<0.001*
	Absent	55	98.2	
Loss of speech or movement	Present	0	0.0	-
	Absent	56	100.0	
Rash	Present	0	0.0	-
	Absent	56	100.0	

Note: * indicates a significant difference in the distribution of the response categories by the Chi-square test for proportion to p-value ≤ 0.05.

When analyzing the effect of gender and the presence of obesity on quantitative variables, significant interaction was observed for SBP, DBP and BMI. In the condition without obesity, lower BMI values were observed in females. For male SBP, higher values were observed among obese individuals and obese men had significantly higher SBP values when compared to obese women. Among obese men, men had higher DBP values compared to women, but among females, non-obese women had higher DBP values compared to obese women.

The male gender had a mean age greater than that of the female gender, but women had a body temperature higher than that of men, regardless of the obesity condition. Regarding the HR, SpO2 and Cut Off Index (COI) for Anti-SARS-CoV-2, there was no significant effect of gender and the presence of obesity (Table 5).

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275 **Table 5.** Comparison of the mean and standard deviation (SD) of the quantitative variables between gender and obesity.

	Gender								Anova two-way		
	Male				Female						
	Obesity										
Obesity	**Present (n=10)**		**Absent (n=29)**		Present (n=4)		Absent (n=13)		Gender	Obesity	Interaction
	Average	SD	Average	SD	Average	SD	Average	SD	p-value	p-value	p-value
Age (years)	45.9	6.3	45.2	7.2	32.7†	11.0	35.6†	12.0	<0.001*	0.704	0.540
BMI (kg / m2)	33.2	5.3	25.5‡	2.3	36.3	3.7	23.2‡†	3.9	0.708	<0.001**	0.026***
SBP (mmHg)	151.0	29.2	133.1‡	12.8	117.7†	4.5	129.3	24.6	<0.001*	0.633	0.030***
DBP (mmHg)	90.0	11.5	85.9	9.5	75.0†	5.8	89.2‡	18.0	0.165	0.227	0.031***
T (ºC)	35.8	0.5	36.0	0.4	36.5†	0.6	36.4†	0.4	<0.001*	0.776	0.226
HR (bpm)	73.9	14.1	77.9	10.4	82.5	9.3	87.3	21.9	0.072	0.373	0.934
SpO2 (%)	96.1	1.8	96.7	1.5	96.5	2.4	97.6	1.0	0.225	0.104	0.643
COI	0.067	0.003	0.073	0.023	0.067	0.002	0.067	0.002	0.599	0.530	0.636

276 Note: * significant effect of gender by the Anova-two-way test for p-value ≤ 0.05; † significant difference in relation to the male gender within the same condition
277 for obesity by the Holm-Sidak Post-hoc test for p-value ≤ 0.05; ** significant effect of obesity by the Anova-two-way test for p-value ≤ 0.05; ‡ significant difference
278 in relation to the presence of obesity within the same condition for sex by the Holm-Sidak Post-hoc test for p-value ≤ 0.05; *** indicates significant interaction
279 between sex and obesity by the Anova-two-way test for p-value ≤ 0.05.
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To analyze the relationship between gender and individual protection measures and the presence of symptoms, only variables with a minimum frequency of five observations were considered. There were no significant differences in the frequency distribution of behavior in relation to individual protection measures and symptoms of sore throat and headache between genders (Table 6).

Table 6. Analysis of the association of individual protection measures and symptoms with gender.

		Gender			Total	p-value
		Male	**Female**			
Use of protective mask	**Yes**	**N**	**37**	17	54	0.638
		%	94.9%	100.0%	96.4%	
	No	N	2	0	2	
		%	5.1%	0.0%	3.6%	
Wash hands	Yes	N	33	14	47	0.346
		%	84.6%	82.4%	83.9%	
	No	N	6	3	9	
		%	15.4%	17.6%	16.1%	
Use of alcohol	Yes	N	38	16	54	0.542
		%	97.4%	94.1%	96.4%	
	No	N	1	1	2	
		%	2.6%	5.9%	3.6%	
Take off shoes and clothes	Yes	N	16	7	23	0.992
		%	41.0%	41.2%	41.1%	
	No	N	23	10	33	
		%	59.0%	58.8%	58.9%	
Mask type	Disposable	N	4	1	5	0.538
		%	10.5%	5.9%	9.1%	
	Homemade / cloth	N	34	16	50	
		%	89.5%	94.1%	90.9%	
Mask cleaning	Correctly	N	17	9	26	0.357
		%	44.7%	52.9%	47.3%	
	Partially	N	18	8	26	
		%	47.4%	47.1%	47.3%	
	Does not perform	N	3	0	3	
		%	7.9%	0.0%	5.5%	
Sore throat	Present	N	4	3	7	0.446
		%	10.3%	17.6%	12.5%	
	Absent	N	35	14	49	
		%	89.7%	82.4%	87.5%	
Headache	Present	N	9	4	13	0.971
		%	23.1%	23.5%	23.2%	
	Absent	N	30	13	43	
		%	76.9%	76.5%	76.8%	

Note: p-value calculated by the Chi-square association test.

4. Discussion

It was decided to carry out the present study correlating the professional activity of a federal police officer with the individual profile and work routines in view of the risk of contagion by the new SARS-CoV-2 coronavirus. In view of the results of the serological tests performed, in which they were all negative, one can take the suggestion that the care used so far has been effective. One can

also think about the hypothesis of non-real results since the false-negative rate is lower 3 days after the onset of symptoms or approximately 8 days after exposure. When you wait 1 to 3 days after the onset of symptoms, you can minimize the possibility of a false negative result [19].

The administrative region of Marília is one of the sixteen administrative regions of the Brazilian state of São Paulo. It is formed by the union of 51 municipalities distributed in four regions of the government, Marília being one of those regions [20]. The municipality of Marília has a total area of 1,170,515 km² and in 2019 it had a population of 238,882 inhabitants [21]. It has an extensive industrial park in the area of food that led it to be known as the National Food Capital. This fact arouses interest to assess the conduct of public agents related to the risk of contagion and population spread of SARS-CoV-2 [22].

The Federal Police Station of Marília covers 67 municipalities, serving an estimated population of 1,188,267 inhabitants. Instituted by law as a permanent body, organized and maintained by the Union and structured in a career, it has competencies in the fight against crime, highlighting investigating various criminal offenses, preventing and suppressing illicit trafficking in narcotics and related drugs, preventing and suppressing contraband and the misuse, to exercise the functions of maritime police, airport, borders and the judicial police functions of the Union. Therefore, due to the coverage area, it presents an expressive interpersonal contact and performance in the field [23].

In addition, the Federal Police Station in Marília has other duties related to immigration, private security, issuing passports, controlling chemicals, arms control and issuing a criminal record certificate. These assignments generate a high turnover in their service stations, increasing the risk of contagion and the spread of diseases [24].

On 7/13/2020, the official organs of Brazil pointed to a total of 1,884,967 confirmed cases of COVID-19 in Brazil, with 72,833 confirmed deaths. In the state of São Paulo there were 374,607 confirmed cases and 17,907 deaths, constituting a rate of incidence inhabitants of 815.8 and mortality inhabitants of 39.0 / 100 thousand. The municipality of Marília (SP), on the same date, had 520 cases and 17 confirmed deaths [25]. This fact, associated with the risks of professional police activity due to the risks of contagion within the Brazilian state with the largest number of confirmed cases and deaths in Brazil, generates interest in establishing its correlations [8,26,27].

Among the analyses carried out in the present study, the Body Mass Index (BMI) of federal police officers resulted in 27.2 ± 5.4 Kg / m2 (mean ± standard deviation). Considering that the result of the BMI calculation must be analyzed according to the classification defined by the World Health Organization (WHO), valid only for adults, overweight (≥ 25 and <30) can be considered. Overweight and obesity are considered risk factors for worsening clinical conditions in patients with COVID-19 [28].

The maximum values of BMI, SBP, DBP and HR observed in the present study indicate that there are elements in the sample with values above the normal that suggest hypertension, resting tachycardia and morbid obesity. Obesity and hypertension alone are already complicating factors for patients with COVID-19. Nine hypertensive participants (16.1%) and 14 obese (25%) were found, but none with a positive Anti-SARS-CoV-2 (COVID-19) serological test [29,30].

Also, in terms of risk factors for health complications, 2 police officers had diabetes and 2 asthma (3.6% each). These two risk factors make us more prone to complications and to die from COVID-19 [31]. Most of the sample had no changes in the work regime and 32.7% showed a reduction in the workload. Several activities have become remote to avoid the contagion and spread of the disease, with reduced working hours and, consequently, reduced wages [32].

In individual protection measures (IPM), most have used detachment, use of a mask, hand washing and alcohol gel as prevention rules. The cloth mask is used by 90.9% of the police, but only 43.3% performs the cleaning correctly. The industrial production of disposable triple protection masks, currently prioritized for use by healthcare professionals, had a significant increase in costs and difficulties in purchasing [33]. The physical properties of a cloth mask, its reuse, the frequency and effectiveness of cleaning can increase the risk of infection [34].

Almost half of the sample does not remove their shoes and clothes when they return from the street. This attitude can increase the chance of transmission to family members in case of contamination [35]. In the suspect screening measures (SSM), only 2 police officers had previously

tested for SARS-CoV-2. The Ministry of Health of Brazil has recommended this conduct. In mass testing sites of the population, an increase in the number of cases can be seen due to either asymptomatic cases or, sometimes, false-positive results. [14,36]

The most frequent symptoms in confirmed cases of SARS-CoV-2 contamination were little or not reported by the police, such as fever, loss of smell, cough and diarrhea. These facts corroborate the negative results of the serological tests performed [37,38]. There is a possibility that they are in the pre-asymptomatic phase, which does not exclude the risk of transmission of the virus, since in this phase, the possibility of transmission is 44% [39].

The most frequent symptoms were sore throat and headache, which, either due to the current season in Brazil being winter or the exhausting and unhealthy routine of the profession, can usually be reported [40,41]. Headache alone is a symptom that can be related to multiple factors. However, prolonged use of the protective mask can increase inhaled carbon dioxide, reduce inspired oxygen and increase respiratory work, and this increased resistance to inspiratory and expiratory flow can lead to symptoms such as sweating, visual changes, headache, dyspnea, increased irritability and decreased reasoning, as well as increased HR and blood pressure [42].

In the analysis of the effect of gender and the presence of obesity on quantitative variables, significant interaction was observed for the SBP, DBP and BMI. There is also a relationship between obesity, SBP and DBP [43]. There were no significant differences in the frequency distribution of behavior in relation to individual protection measures and symptoms between genders, in agreement with similar studies [44].

As limitations of the present study, the absence of positive results in the serological test can be considered for later confirmation by RT-PCR. This fact creates the prospect of new testing in a period subsequent to that currently carried out, especially considering the nebulous scientific scenario in which we live in the face of this new Coronavirus, in which until the period between Sars-Cov-2 infection and production of antibodies by a healthy person's body is unknown.

5. Conclusions

In view of the results obtained, it can be concluded that care in relation to the professional activities of federal police officers in the selected sample, with individual protection and measures to screen suspects, has hitherto avoided contagion with SARS-CoV-2. Such conduct must be maintained and care should be increased because risk factors, which involve quality of life and risk of worsening health conditions due to contamination, were detected in the participants.

Supplementary Materials: The following are available online at www.mdpi.com/xxx/s1, Figure S1: Questionnaire applied to research participants; Figure S2: Term of authorization from the Chief of the Federal Police of Marília (São Paulo, Brazil).

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