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# Teleconsultation and the scope of care in epidemiological clinical logic: an experience report

A teleconsulta e o alcance da assistência na lógica clínica epidemiológica: um relato de experiência

Teleconsulta y el alcance de la atención en la lógica clínica epidemiológica: Un informe de experiencia

## RESUMO

A telemedicina é uma ferramenta recente instituída pelo Ministério da Saúde, que permite a realização de suporte e assistência médica de forma remota/virtual. Objetivo: Avaliar a experiência do uso da telemedicina como mecanismo alternativo para prestação da assistência à saúde de casos suspeitos durante a pandemia de COVID-19. Método: Um estudo epidemiológico observacional descritivo. Realizado análise do prontuário médico em relação aos atendimentos oferecidos pelo Sindicato da categoria aos trabalhadores de dois frigoríficos da região Sul de Santa Catarina, em abril de 2020. Resultados: Houve procura de 40 funcionários, a maioria mulheres (55,3%), da cidade de Forquilha - SC (76,3%) e 36,8% trabalhavam no setor corte de coxa. Os sintomas mais referidos foram tosse e congestão nasal, houve suspeita de Covid-19 em 32 trabalhadores. Conclusão: A telemedicina é uma ferramenta que contribui para a diminuição da disseminação do vírus e proporciona assistência à saúde contemplando um maior número de indivíduos.

Descritores: Telemedicina; Teleconsulta; Covid-19.

## ABSTRACT

Telemedicine is a recent tool created by the Ministry of Health, which allows for remote/virtual support and medical assistance. Objective: To evaluate the experience of using telemedicine as an alternative mechanism for providing health care to suspected cases during the COVID-19 pandemic. Method: A descriptive observational epidemiological study. Analysis of the medical record was carried out in relation to the services offered by the union of the category to workers of two slaughterhouses in the southern region of Santa Catarina, in April 2020. Results: There was demand for 40 employees, mostly women (55.3%), from city of Forquilha - SC (76.3%) and 36.8% worked in the thigh cutting sector. The most reported symptoms were cough and nasal congestion, with suspicion of Covid-19 in 32 workers. Conclusion: Telemedicine is a tool that contributes to reducing the spread of the virus and provides health care covering a greater number of individuals.

Key Words: Telemedicine; Teleconsultation; Covid-19.

## RESUMEN

La telemedicina es una herramienta reciente creada por el Ministerio de Salud, que permite el apoyo y la asistencia médica remota / virtual. Objetivo: Evaluar la experiencia del uso de la telemedicina como mecanismo alternativo para brindar atención médica a casos sospechosos durante la pandemia de COVID-19. Método: Estudio epidemiológico observacional descriptivo. Se realizó el análisis de la historia clínica en relación a los servicios ofrecidos por el sindicato de la categoría a los trabajadores de dos mataderos de la región sur de Santa Catarina, en abril de 2020. Resultados: Hubo demanda de 40 empleados, en su mayoría mujeres (55,3 %), de la ciudad de Forquilha - SC (76,3%) y el 36,8% trabajaba en el sector de corte de muslos. Los síntomas más reportados fueron tos y congestión nasal, con sospecha de Covid-19 en 32 trabajadores. Conclusión: la telemedicina es una herramienta que contribuye a reducir la propagación del virus y brinda atención médica que cubre a un mayor número de personas.

Palabras clave: Telemedicina; Teleconsulta; Covid-19.

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## INTRODUCTION

In the midst of the pandemic, scientists are carrying out research at an accelerated pace to know the behavior of the virus, the pathophysiology of the disease, preventive measures, treatment or the way in which health services are organized to face the current moment in which we live. What to do? This question is one of the most frequently asked around the world right now.

The current pandemic caused by the SARS-COV-2 virus, a virus of the species of the coronavirus family, is probably a mutation of a coronavirus found in bats found in Hubei province, China. <sup>1</sup> This new agent was discovered on 12/31/2019 and causes the disease called COVID-19, which can cause in humans from mild symptoms to severe complications. <sup>2</sup>

As it is an RNA virus and of the Beta-coronavirus C lineage, SARS-COV-2 facilitates and determines that there is a greater tendency for mutations and dissemination to occur. Furthermore, coronaviruses form a large family of RNA viruses, and are so named because of the presence of spikes on their surface. <sup>3</sup> Transmission occurs from one infected person to another or through

close contact, through salivary droplets or aerosols, through direct contact or with contaminated objects or surfaces. <sup>4,5</sup>

The first record of the use of telemedicine dates back to 1906, with remote electrocardiographic consultation by telephone. In 1959, there were the first transmissions of X-rays and other images between professionals, however, telemedicine truly began its practice in the 1960s, in the United States, making use of communication systems in order to monitor vital parameters of astronauts in space in order to ensure medical care as effectively as possible. <sup>6</sup>

A study evaluated a series of articles on telemedicine, with the aim of listing the main advantages and disadvantages of this practice. The performance of telemedicine was analyzed in different scenarios, with male and female individuals, from young to elderly, and with different economic and health conditions. Although some barriers to this practice were listed, such as internet speed and availability of devices for consultation, the study concluded that telemedicine is a service format that has several benefits and a series of facilitators. <sup>7</sup>

On February 6, the national government created Law No. 13.979, which pro-

vides for measures to deal with the Public Health Emergency of national importance resulting from the coronavirus. Therefore, on March 15th, 2020, Law No. 13.989 was created, authorizing the use of telemedicine for the duration of the crisis caused by the coronavirus (SARS-CoV-2). <sup>8,9,10</sup>

Before the arrival of the pandemic, caused by the coronavirus, telehealth was already being widely adopted to bring specialized care to the homes of sick individuals and their families. It makes it possible to provide quick access to specialists who are not immediately available, and this can be even more valuable in countries where certain specialties are particularly scarce, particularly outside large cities. <sup>7</sup>

Telemedicine is an area of medical assistance that is constantly expanding around the world and is nothing more than the performance of medicine through technologies. <sup>6</sup> Teleconsultation, also called telehealth or remote consultation, encompasses the interaction between a clinician and a patient and is intended to provide diagnostic or therapeutic advice. Remote consultation is a safe, useful and efficient way to identify suspected cases, guiding the patient's diagnosis and treatment. <sup>10</sup>

Different reports presented in a study prove that the use of telehealth can bring benefits, such as reduced service time, travel costs for patients and health professionals and improvements in the quality of care, by enabling access to specialists by health professionals non-specialized from remote areas. A broad market and the flexibility of digital technologies currently, adjusting to the health needs and individuality of each social context, are capable of providing innovative solutions for the provision of health services and guidance, opening up opportunities for their use in the case of epidemics, especially that of COVID-19 experienced at this time. 11

The health sector has been reorganizing itself to absorb the significant increase in health care that the infected need, especially in moderate and severe cases. However, the news is frequent that the services offered are below demand, and there is a lack of doctors, nurses and personal protective equipment, among other essential items. It is in this context that the Union of Workers in the Meat and Derivatives, Chickens, Balanced Feed, Food and Related Industries of Criciúma and Region (SINTIACR), in partnership with the University of the Extreme South of Santa Catarina (UNESC), organized a support service to the worker of two slaughterhouses at its base.

Health care and food manufacturing companies were considered essential services. Because of this, they are not subject to social isolation, and must maintain their activities to meet the needs of the population. In turn, many workers from two large slaughterhouses in SINTIACR's base of action sought out the union to inform them that they were very afraid of continuing to work. These workers claimed to work side by side with colleagues who had flu-like symptoms, but who did not have access to a health service capable of evaluating and taking the necessary measures. An example of this is the issuance of a document for removal from work for the purpose of social isolation. At the same time, the Ministry of Health carried out action and forefront, and issued ordinance No. 467, of March 20th, 2020, which allowed remote medical

care. 12,13

From this, SINTIACR and the Center for Promotion and Clinical Care to Occupational Health (NUPAC-ST), linked to the University of Extremo Sul Catarinense (UNESC), organized a medical tele-assistance service, allowing access to workers who may be unattended from the two refrigerators mentioned. Thus, the objective of this experience report is to evaluate the experience of using a new telemedicine strategy as an alternative mechanism for providing health care for suspected cases during the COVID-19 pandemic.

## METHODS

This research was based on the analysis of medical records regarding the services offered by the Union to workers of two slaughterhouses, one with a total of 1.350 workers, located in the city of Forquilha and the other with 2.100 workers located in the city of Nova Veneza, municipalities in the interior of the state of Santa Catarina. This study was characterized as descriptive observational epidemiological.

The study has a report of professional experience, which analyzed data for the month of April 2020, with a total of 38 consultations. The following variables were analyzed: Gender, age, company, work sector, occupation, main complaint, clinical research of respiratory symptoms, diagnosis and consultation.

For statistical treatment and epidemiological analysis, data were analyzed using the EPI INFO version 7.

The entrance to the service came from the SINTIACR, which announced the offer of medical care via telemedicine to workers with flu-like symptoms among workers at the two slaughterhouses. This disclosure was carried out through union directors who work at the two factories.

When seeking information about this service from the union, the worker was informed that there was a medical schedule available two days a week (Monday and Friday) from 2 pm, with a change in the schedule according to medical availability and national holidays, always keeping two

days weekly.

The consultations were scheduled according to the workers' contact with the union, after which the employee attended the indicated location, being received by a physiotherapist linked to UNESC, properly dressed for contact with a patient potentially contaminated by coronavirus. After some initial clarifications about the service, it was explained to the workers that it was a virtual consultation, and how to proceed in the teleconsultation situation. After guidance, the physical therapist started a questionnaire that included from basic identification to data related to respiratory symptoms, the questionnaire data were previously established together with the responsible physician, after completing the filling, the data were sent to the physician by electronic means. The place used for consultations belonged to the union of the category and was well ventilated and had a space reserved for consultations. The equipment used was a computer/notebook, a smartphone, a printer for the generated documents, a pulse oximeter and a digital infrared thermometer.

At the end of the consultation, the patient received the proper guidance, documents resulting from the service, such as a medical certificate for social isolation, request for tests, a prescription for medication and general guidance. All these documents had the responsible physician's electronic signature (except for the general guidelines), they were sent in PDF format to the physiotherapist, who printed the documents and passed them on to the individual.

## RESULTS

Medical records referring to the care of 38 workers, aged between 19 and 50 years, were analyzed and it was found that the majority consisted of women. The city with the highest number of employees was Forquilha, followed by Criciúma. Regarding the company of origin, it was found that 24 (63,2%) workers worked at the Seara company, while 14 (36,8%) were from the Agroveneto JBS company. The

functions performed are mostly configured as production assistants (Table 1).

A total of 38 employees were obtained who sought the tele-assistance service due to respiratory complaints. The criterion for medical care was based on the research of complaints of respiratory symptoms 12,13 which was based on the search for the following signs and symptoms, surveyed with the patients: shortness of breath, fever, cough, dysphonia or hoarseness, sore throat, nasal congestion or runny nose, and change in taste and/or smell.

Among the employees who sought tele-service, 5 (13,2%) of them had comorbidities. Asthma was the most mentioned pathology by workers, affecting 3 (7,9%) of them, followed by Systemic Arterial Hypertension (SAH) in 2 (5,3%) employees.

Among the patients who sought tele-service, there was no correlation between the sector in which the slaughterhouse employees worked and the dyspnea symptom, with a p-value = 0,221. The only statistically significant correlation found in this study was between dyspnea and suspicion for positive Covid-19 variables with p value = 0,037.

## DISCUSSION

Among workers with respiratory symptoms who sought the call center, the main symptom reported by patients was cough, together with nasal congestion, which occurred at the same frequency (Table 2). In a study 14, the most reported symptom among patients with COVID was cough (67,8%), followed by nasal congestion (4,8%).

Among the employees who sought tele-service, 5 had comorbidities (Table 3). In a research by Guan et al. (2020) 15, it was observed that 23,7% had at least one co-existing disease, Systemic Arterial Hypertension reached 15,0% of them. The article by Onder et al. (2020) 16 concluded that risk factors may favor the development of the most severe forms of COVID-19. The most significant aspects are advanced age and the presence of comorbidities. The most common pathologies found in his

Table 1. Sociodemographic and occupational task data of slaughterhouse workers with flu-like symptoms. Santa Catarina, 2020.

	MEAN ± SD, N(%)
N=38	
<b>AGE (YEARS)</b>	28,55 ± 7,89
<b>SEX</b>	
Female	21 (55,3)
Male	17 (44,7)
<b>CITY</b>	
Forquilha	29 (76,3)
Criciúma	6 (15,8)
Araranguá	2 (5,3)
Nova Veneza	1 (2,6)
<b>EMPRESA</b>	
Seara	24 (63,2)
Agrovêneto	14 (36,8)
<b>SECTOR</b>	
Thigh cut	14 (36,8)
Chest cut	5 (13,2)
Leg cut	5 (13,2)
Wing cut	4 (10,5)
Breast fillet	3 (7,9)
FIS	2 (5,3)
Expedition	2 (5,3)
Freezing	1 (2,6)
Giblets	1 (2,6)
Intern market	1 (2,6)

Caption: Real number (n) or relative percentage (%) of the following variables: Age, gender, city, company, sector. Source: Survey data, 2020.

study were chronic respiratory, heart disease, kidney disease, diabetes and hypertension. In the study by Chen et al. (2020) 17, it was observed that 63% of the cases that died and 39% of those that recovered had

Table 2. Flu-like symptoms in cold-storage workers assisted in teleconsultation.

SYMPTOMS	N(%)
N=38	
Cough	27 (71,1)
Nasal Congestion	27 (71,1)
Sore throat	26 (68,4)
Dysphonia / Hoarseness	23 (60,5)
Fever	18 (47,4)
Dyspnea	15 (39,5)
Change in taste and/or smell	15 (39,5)
Headache	5 (13,2)

Caption: Real number (n) or relative percentage (%) of variables related to flu-like symptoms. Source: Survey data, 2020.

Table 3. Risk factors and suspicion of Covid-19 in slaughterhouse workers assisted in teleconsultation.

	N(%)
N=38	
Risk factors	5 (13,2)
Asthma	3 (7,9)
SAH	2 (5,3)
Suspicion of COVID-19	32 (84,2)

Caption: Real number (n) or relative percentage (%) of comorbidity and suspicion variables Covid-19. Source: Survey data, 2020.

at least one chronic disease. The slaughterhouse environment provides the agglomeration of employees who work on the production lines.

The slaughterhouse environment provides the agglomeration of employees who

Table 4. Correlation between age and dyspnea in slaughterhouse workers assisted in teleconsultation.

	DYSPNEA, N(%), MEAN ± SD		
	Yes	No	p- Value
	n=15(39,5)	n=23(60,1)	
Age (years)	27,87 ± 6,22	29,00 ± 8,92	0,976

Caption: Real number (n) or relative percentage (%) and Correlation between age vs. dyspnea of comorbidity variables and Covid-19 suspicion. Source: Research data, 2020. Value obtained after applying the Mann-Whitney U test

Table 5. Relationship between the variables dyspnea vs sector and dyspnea vs suspicion of Covid-19 in slaughterhouse workers assisted in teleconsultation.

	COVID-19, N (%)		p-Value
	Positive suspicion n=32	Negative suspicion n=6	
<b>SECTOR</b>			
Thigh cut	11 (34,4)	3 (50,0)	0,221†
Chest cut	3 (9,4)	2 (33,3)	
Leg cut	5 (15,6)	0 (0,0)	
Wing cut	4 (12,5)	0 (0,0)	
Breast fillet	3 (9,4)	0 (0,0)	
<b>FIS</b>			
Expedition	2 (6,3)	0 (0,0)	
Freezing	1 (3,1)	0 (0,0)	
Giblets	0 (0,0)	1 (16,7)	
<b>INTERN MARKET</b>			
	1 (3,1)	0 (0,0)	
<b>DYSPNEA</b>			
Yes	15 (46,9) <sup>b</sup>	0 (0,0)	0,037‡
No	17 (53,1)	6 (100,0) <sup>b</sup>	

Caption: Real number (n) or relative percentage (%) and Correlation between sector vs. Suspected Covid-19 and dyspnea vs. suspected Covid-19.

† Value obtained after application of the likelihood ratio test.

‡ Value obtained after applying Fisher's exact test. b Letter indicating statistically significant value after residue analysis.

Source: Survey data, 2020.

tal conditions are characterized by low temperatures and restriction of air renewal. This favors the spread of the virus and leads to a high rate of contagion in these environments. Another aggravating factor for the increase in contamination occurs due to the daily commuting of workers between neighboring municipalities in public transport, which can provide the emergence and increase in the number of cases not only in the city where the slaughterhouses are located. 18 According to a study, surveillance and health education actions for workers are important to identify problems and risk factors, as well as to articulate scientific knowledge for a better care practice, providing safe spaces for workers when returning to their work activities. 19

The last data analyzed in this research was the outcome in relation to medical care. The 38 workers assisted have received medical certificates to initiate or complete

an initial 14-day leave, and 100% of the workers received a request for a specific test for etiological diagnosis, the RT PCR COVID-19. All were instructed to seek the municipal public health service to carry out the tests, but no results have returned to the researchers so far. Some workers reported that the response of the public health service was that they were unable to perform the test due to the lack of necessary supplies for it.

Finally, it is noteworthy that at the end of each day of care, a letter was prepared to the municipal epidemiological surveillance reporting the care provided, with the list of suspected cases described by name and their respective telephone contacts.

## CONCLUSION

Although teleconsultation has some limiting factors, it is concluded that it can be a great ally in medical care, providing consultation and guidance, as it has different benefits, already mentioned in this research, especially in events that the population has to live with social isolation, as in cases of pandemic crises.

The results found and evidenced in this study demonstrate that the use of telemedicine as an accessory or support tool for health assessment can constitute an important device in the set of care practices offered to the population, in order to contribute to the efficiency of the system as a whole.

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