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## Delays in cancer diagnosis, with a focus on oral cancer during the COVID-19 pandemic - literature review

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### ABSTRACT

**Introduction:** Since the 2019 Coronavirus Disease (COVID-19) was classified as a pandemic infection on March 11, 2020, it has spread rapidly around the world. The total number of confirmed infections was 217,119,281 and the total deaths were 4,510,202 worldwide, as of August 31, 2021. The changes in life caused by these new threats also impacted patient care. Medics around the world have had to adapt to this new reality. There is a lot of research into the impact of the COVID-19 pandemic on the diagnosis and treatment of other diseases, including cancer.

**The aim of the study:** Paying attention to the causes of delays in the diagnosis of cancer during the COVID-19 pandemic, with particular emphasis on oral cancer.

**Material and method:** The research was done using the PubMed and Google Scholar articles about the topics of: covid-19 pandemic; oral cancer; healthcare; cancer diagnosis

**Description of the state of knowledge:** The COVID-19 pandemic has had a huge impact on the entire health system around the world. According to various studies, there were fewer

cancer diagnoses between 2020 and 2021. Studies have identified the causes of these delays, such as: overwork and fatigue of health care workers, limited access to doctors due to quarantine, patients' fear of being infected in a health care facility, and the lack of follow-up visits, including dental visits.

**Summary:** Undoubtedly, the coronavirus (COVID-19) pandemic has put the people with chronic illnesses and those who are immunocompromised at the most risk. Solutions such as telemedicine during lockdown may be helpful in caring for cancer patients, but cannot replace a comprehensive examination by a doctor, especially in the case of oral cancer. As a result of the diagnostic delays caused by the COVID-19 pandemic, a significant increase in the number of cancer deaths worldwide is expected.

**Key words:** covid-19; pandemic; oral cancer

## Introduction

Since the 2019 Coronavirus Disease (COVID-19) was classified as a pandemic infection on March 11, 2020, it has spread rapidly around the world. The total number of confirmed cases of infection reached 217,119,281 out of 4,510,202 deaths worldwide, as of August 31, 2021. At the end of 2020, the first vaccination against COVID-19 was authorized, and as of August 30, more than 21% of the world's population is fully vaccinated against COVID-19, which gives hope for a solution to the pandemic. However, there are concerns that the pandemic will continue for a long time due to new mutations of the virus. Cancer patients are particularly at risk of severe COVID-19 disease because of a weaker immune system. Cancer departments have had to undergo several modifications to protect patients and healthcare professionals from COVID-19 infection while trying to maintain the diagnosis, therapy, and research of cancer. Telemedicine, including tele-oncology, has also been developed. In this review, we discuss the indirect effects of the COVID-19 pandemic on cancer patients, in particular oral cancer patients, and detail the causes of delays in cancer diagnosis in 2020-2021. We took into account factors such as overwork and fatigue of health care workers, transforming other hospital wards into wards where COVID-19 was treated, developing telemedicine and remote diagnosis, and postponing dental checkups due to quarantine or fear of COVID-19 infection.

## Fatigue and overload of health care workers

Life changes due to these new risks also are affecting patient care. Medics around the world have had to adapt to this new reality. This led to a significant problem of overloading of many doctors, nurses and other medical professionals. A Large-Scale Survey on Trauma, Burnout and Posttraumatic Growth during the COVID-19 Pandemic of 12,596 nurses published in November 2020 showed that 34.8% of participants experienced difficulties sleeping or had poor sleep quality, 33.9% continually believed that a similar disaster would occur in the future, 28.1% became particularly nervous or frightened during unexpected events, and 27.6% exhibited symptoms of irritation or were angered easily. Furthermore, 24.6% of participants experienced unhappy thoughts or memories related to their experiences with the epidemic despite deliberately attempting to avoid them [1]. The situation is getting worse with successive waves of COVID-19 around the world. A study published in April

2021 on burnout in health care during the pandemic found that 53% of health workers experienced high levels of burnout [2].

According to the article on mental health of healthcare providers during the Covid-19 pandemic, in order to be efficient, healthcare providers must have good mental health status. Mental health of healthcare providers is essential to overall healthcare quality and the economy of the nation, especially during COVID-19 pandemic [3]. Reduction in work effort or leaving the job results in scarcity of healthcare providers (the workforce) and affects healthcare systems. Fatigue and overload of health care workers is one of the factors behind the delay in the diagnosis of cancers, including oral cavity cancers. Oncologists are exposed to an increased risk of burnout on a daily basis as they regularly report bad news and often prescribe treatments that have a lot of side effects. They also have to deal with the patient's family, which often has unrealistic expectations of treatment. Both individual and external/organizational risk factors have been associated with an increased risk of developing burnout in the field of oncology. Individual risk factors consist of sociodemographic and personality characteristics, while external risks are environmental, occupational, and organizational [4,5]. Doctors of every profession around the world have experienced enormous pressure from society, as well as stress from insufficient protection against contamination and the frustration of not being able to provide optimal patient care. The relationship between burnout in health care workers and medical errors, including inappropriate or late diagnosis, is the subject extensive research.

Numerous authors point out that overworked health care can be even more harmful than the coronavirus itself. For example, it is estimated that in 2020 more than 250,000 people in South America died due to a medical error [6]. In one study, American surgeons were asked whether they had committed major medical errors and what was the most common cause of them. Of 7905 participating surgeons, 700 (8.9%) reported concern they had made a major medical error in the last 3 months. Over 70% of surgeons attributed the error to individual rather than system level factors. The researchers' conclusion was unequivocal: major medical errors reported by surgeons are strongly related to surgeon's degree of burnout and their mental quality of life [7]. In order for the diagnosis to be as accurate as possible, health care workers must not be exhausted and overworked.

### **Closed hospital wards and difficult access to a doctor.**

Hospitals were not prepared for an influx of such a large number of patients requiring immediate care due to the severe course of COVID-19 disease. Protection of both patients and their carers in oncology wards is a priority for employees of oncological hospitals during the COVID-19 pandemic. The coronavirus SARS-CoV-2 (COVID-19) outbreak has a profound impact on the management of patients with cancer. On September 11, 2020, an article was published on the delayed effects of the closure of the Oral Medicine Department (Universidad Nacional de Córdoba). They described 4 cases of their patients. First patient delayed her treatment because of the impossibility of getting from his town to our city due to the quarantine (and fear of COVID infection). In March, 2020, a 72-year-old woman was diagnosed with a well-differentiated squamous cell carcinoma of the oral cavity (OSCC). She was referred to the oncology committee with an advanced lesion as T1N0M0. Due to quarantine she returned to the hospital in July and the tongue lesion became bigger and

painful, she also had lymphadenopathies. Another patient was referred by his dentist to this facility in February 2020 due to changes in the tongue. Two biopsies showed hyperkeratosis with moderate dysplasia. The patient was unable to undergo the recommended surgery because of quarantine. In June, they received photos from telemedicine showing the increase in the size of the lesion. The biopsy identified invasive OSCC. The described third case is a 93-year-old man who presented with a painful lesion in his mouth that made it impossible to use a lower denture. The first symptoms were noted in April. Doctors recommended that he waits for a consultation to avoid the risk of COVID-19 infection. After 3 months, the tumor was ulcerated and bleeding, diagnosed as invasive OSCC with bone infiltration. The last case is a 63-year-old woman with a tumor located on the upper gum. The biopsy revealed papillary carcinoma. The tumor did not infiltrate the jaw bone and was issued as T2N0M0. Nevertheless, due to the COVID-related delay in oncology treatment, the change became an OSCC with an invasive pattern and bone infiltration [8]. All described patients were indirectly affected by the COVID-19 pandemic.

As healthcare providers are reorganized to ensure the high priority of the COVID-19 patients, there is a shortage of hospital beds and a lack of availability of specialists dealing with chronic diseases, including cancer. This delays diagnosis and treatment. As a result, the COVID-19 epidemic is currently having a huge impact on cancer care [9]. Relatives who usually accompany patients during diagnosis, treatment and care were not allowed to visit patients in hospitals. As a result, primary care professionals became the main providers of psychological interventions for patients in hospitals [9]. Quarantine, fear of COVID-19 infection and the lack of relatives at the most difficult times mean that, especially the elderly, postponed visits to doctors, including dentists, who are often the first to notice the symptoms of cancer in the mouth. Doctors around the world had to make a very difficult decision. On the one hand, it was preferable to postpone the procedure for the sake of patient safety. [11] On the other hand, a delay in the diagnosis and treatment of cancers, including oral cancers, may lead to more advanced stages, with higher morbidity and mortality rates. There is no clear evidence of which approach poses less risk to the patient. [8]. Fewer cancer diagnoses, including oral cancer, have been observed and described in many countries including the Netherlands [12], England [13, 14], the USA [15, 16], Italy [17], Japan [18] and Argentina [8]. According to an article on the impact of Covid-19 on cancer care among American seniors in March-July 2020, in comparison with the baseline period of March-July 2019, there is a substantial decrease in cancer screenings, visits, therapy, and surgeries, with variation by cancer type and site of service. At the peak of the pandemic in April, screenings for breast, colon, prostate, and lung cancers were lower by 85%, 75%, 74%, and 56%, respectively [15].

## **Telemedicine**

Due to limited access to clinics and hospitals, many doctors decided to use telemedicine in order to stay in constant contact with patients, which is especially important for cancer patients. In addition to the greatest advantage of telemedicine during a pandemic, which is the lack of exposure to COVID-19 infection, many other advantages of telemedicine have been described, for example: better access to a doctor in areas remote from the city, faster consultation and no queues in the corridor in front of the doctor's office [19,20]. Telemedicine's application in oncology is referred to as tele-oncology and is used to advance

cancer care. Tele-oncology has shown great promise in supporting oncology care not only during this pandemic, but will also become part of normal care in the future [19]. Despite this, there are many disadvantages of telemedicine. First of all, there are significant limitations to the physical examination of the patient. The diagnosis can only be based on the subjective feelings of the patient [21]. Some patients reported feelings of nervousness and anxiety surrounding the use of new technology [19]. 100 US veterans were asked about their satisfaction with tele oncology. Patients overall were satisfied with tele-oncology (83% Agree or Strongly Agree) but felt less satisfied than in-person visits (47% Agree or Strongly Agree) [22]. The pros and cons of telemedicine are widely discussed in many studies. Certainly, they can accelerate the diagnosis of cancer in some cases, but due to the limited possibility of a physical examination, they cannot replace a traditional medical visit.

### **Postponed dental visits during the pandemic**

In July 2020, a survey was conducted in Germany regarding postponed dental visits. The analytical sample consisted of 974 individuals (average age was 45.9 years). The outcome measure was postponed dental visits since March 2020 (yes; no) due to the COVID-19 pandemic. Furthermore, the type of postponed dental visits was recorded (check-up/regular dental examination; pain/dental complaints; planned therapy). The results were as follows: 22% of participants reported to have postponed dental visits due to the COVID-19 pandemic since March 2020, whereas 78% of individuals did not report postponed visits (“no, attended as planned”: 29.2%; “no, examining pending”: 44.9%; “no, other reasons”: 3.9%). Among individuals who reported postponed dental visits, 72% postponed a “check-up/regular dental examination”, whereas 8.4% postponed a dental visit despite “pain/dental complaints” and 19.6% postponed “planned therapy” [23]. The conclusion of this study was that more than one out of five individuals postponed a dental visit — particularly check-ups and regular dental examination — due to the COVID-19 pandemic from March 2020 to July 2020.

Dentists are often the first line of diagnosis, as they work in close contact with patients. On 15 March 2020, the New York Times published an article entitled “The Workers Who Face the Greatest Coronavirus Risk”, where an impressive schematic figure described that dentists are the workers most exposed to the risk of being affected by COVID-19, much more than nurses and general physicians [24]. Due to high exposure to COVID-19, many dentists' offices remained closed or remained open only to patients with pain or patients who could not be rescheduled. As a result, many of the control visits did not take place during the pandemic. The influence of regular dental visits on the early detection of cancer of the mouth and throat was investigated. Research shows that increased regularity of dental examinations is associated with an earlier diagnosis of oral cancer [25,26,27,28]. Research shows that increased regularity of dental examinations is associated with an earlier diagnosis of oral cancer. A 2009 study in Florida showed that Patients with a regular primary care dentist were more likely to be diagnosed for oropharyngeal cancer at early stages (65%) than those without a regular primary care dentist (41%). Patients with a regular primary care dentist were more likely to be diagnosed at early stages (65%) than those without a regular primary care dentist (41%) [27]. Considering the importance of regular dental checkups for the early detection of oral cancer, we can expect that due to limited access to a dentist, some diagnoses have been delayed.

## Conclusions

It should be assumed that factors such as: overwork and fatigue of health care workers, limited access to doctors due to quarantine, and the lack of follow-up visits, including dental visits, have a huge impact on delaying cancer diagnosis. Due to fear of infection, patients were often hospitalized too late. The dentist is often the first doctor to notice disturbing changes in the oral cavity. Since many dental checkups have been canceled, many of these changes may have been noticed too late. Diagnostic delay of oral cavity cancers can be related to advanced-stage tumors and poor prognoses. In the longer term, this will lead to increased deaths due to late detection of the disease. The consequences of the COVID-19 pandemic will be felt for a long time to come, both by patients and by healthcare professionals.

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