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Study of the changes in the professional behavior of dentists during of the Covid-19 pandemic

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Abstract

Introduction: *Dentists are part of the leading medical professionals and their role in preventing the transmission of COVID-19 is extremely important. Dentists have been identified as having a "very high risk" of exposure, particularly when performing aerosol generating procedures on infectious patients.*

Aim: *To study the transition of dentists' professional behavior induced by Covid-19 pandemic and to analyze the problems in compliance with the anti-epidemic measures.*

Materials and methods: *An anonymous survey was conducted among 466 dentists, includes 19 questions relevant to: prevention and control of dental infections, financial and logistical difficulties and so on. The study timeframe is July 2020 - October 2021.*

Results: *According to the type of treated patients, 55% (n = 258) of dentist state that they've served only emergencies, thus complying with the recommendations of the Bulgarian dental association. Lack of change in the daily practice was reported by 30% (n = 140) of the respondents. Of the respondent, 69% (n = 322) had a problem getting supplies, such*

as gloves, masks, disinfectants, etc. and respectively 31% (n = 140) had no problem and most dentists (92%, n = 427) reported paying a drastically higher amount to supply the necessary quantities of them. More than half of the respondents (51.5%, n = 240) were afraid while working with patients.

***Conclusions**: Only strict adherence to the WHO recommendations would help to quickly deal with the pandemic, reduce financial losses and logistics, save lives and help preserve the physical and mental health of people.*

Keywords: dental infections prevention, anti-epidemic measures, COVID-19 in dentistry

Introduction

Coronavirus (COVID-19) has challenged health professionals in all fields. Dentists are part of the leading medical professionals and their role in preventing the transmission of COVID-19 is extremely important(1). Responsible behavior of dentists, aimed at stopping the spread of the virus in dental practices, recommends performing only emergency procedures in cases of severe pain, trauma and odontogenic infections that may expose various organs or systems to risk(2). On the other hand, dental specialists cannot continue to delay manipulations for months and years, given that the pandemic shows no signs of abating.

The safe performance of procedures for both patients and staff after the onset of the virus is insufficiently studied. Dentists have been identified as having a “very high risk” of exposure, particularly when performing aerosol generatiing procedures (AGP) on infectious patients(3). Respiratory droplets and aerosol transmission have been identified as potential transmission pathways for COVID-19(3-6). Dental turbines cause the formation of aerosols and sprays, often contaminated with bacteria, viruses, fungi and most dental procedures, and blood(7). Aerosols are liquid and solid particles (<50 μm diameter) suspended in the air for extended periods Sprays are a mixture of air, water and / or solids (50 μm to several millimeters in diameter), both of which pose a risk to the health of the dental team and patients(1).

Standard masks, when worn properly and changed frequently, offer about 80% filtration rate. This is a good protection for elective dentistry under normal circumstances, knowing that most of our patients are healthy.1 All this outlines the real risk of transmission of infections in the dental practice, including Covid-19 and determines the need for even more meticulous compliance with the anti-epidemic measures when working with patients.

Aim

To study the transition of dentists’ professional behavior induced by Covid-19 pandemic and to analyze the problems in compliance with the anti-epidemic measures in the context of day-to-day dentistry practices.

Material and methods

An anonymous survey was conducted among 466 dentists in the city of Plovdiv and in other cities under an emergency epidemic situation because of COVID-19. The questionnaires are filled in by dentists working in individual and group dental practices, dental clinics in Plovdiv, Faculty of Dental Medicine (SPF) of the Medical University - Plovdiv, as well as dentists from all over the country through various dental internet groups. The questionnaire includes 19 questions addressing various problems: prevention and control of

dental infections (DID), access to personal protective equipment necessary for their daily work, financial and logistical difficulties in organizing their work during the SARS-CoV-2 / Covid-19 pandemic. The study timeframe is July 2020 - October 2021.

Descriptive and inferential statistics were performed. Continuous variables were first tested for normality of statistical distribution by Shapiro–Wilk test. All normal distribution measurement data are expressed as the mean ± standard deviation (SD). The non-normally distributed data were expressed as median and interquartile range. Categorical variables were presented as absolute/relative frequencies (counts / %). Statistical analysis of the data was performed using SPSS v.26 for Windows (IBM Corp. Released 2019. Armonk, NY: IBM Corp).

The confidentiality of the data is guaranteed by encryption and anonymization. The study follows the CIOMS guidelines for epidemiological research, and it is planned to collect a minimum amount of data using a special identification number (ID) of the participants.

Results

The survey included 466 respondents with an average age of 43 and an average length of service of 18 years.

According to their main place of work, the respondents were distributed as follows: the majority (63%, n = 294) worked in individual dental practices, 22% (n = 102) were part of group dental practice, and 15% n = 70) were lecturers at the Dental Faculty-Plovdiv.

As expected, the majority (94%, n = 438) stated that they had changed their professional behavior during the epidemic.

According to the type of patients treated during the pandemic, 55% (n = 258) of dentist state that they've served only emergencies, thus complying with the recommendations of the BDA. Lack of change in the daily practice was reported by 30% (n = 140) of the respondents, while 14% (n = 66) had stopped admitting patients, and 0.4% (n = 2) did not answer.

Information about the additional anti-epidemic measures and the overall epidemiological situation was obtained from the instructional materials of the BDA (available and regularly updated on the institutional website 8) by 28% (n = 131). Other respondent main sources of information were: television (14%; n = 64), Internet (55%; n = 257), and 3% (n = 14) received information from elsewhere.

As for the additional anti-epidemic measures taken (with the possibility of more than one correct answer), during this period, we had the following distribution: 36% (n = 417) used additional protective clothing; 38% (n = 434) have undertaken more frequent and radical disinfection of surfaces, as well as extremely important in the work and presence of aerosols – ventilation; 21% (n = 240) have worked only with healthy patients (presumably), which is not a reliable enough prevention, as it is known that COVID-19 could be transmitted by patients that is not symptomatic. Other measures have been taken 5% (n = 54), without specifying which ones.

Additional protective clothing (not including surgical mask and gloves) wearing by dentists, was indicated as : specialized mask with a high level of protection (28% ; n = 306); disposable overalls (14%; n = 155); reusable overalls (17%; n = 184); helmet (37%; n = 408), and another type of protective clothing, but without specifying what – (4%; n = 47). Optimal workwear should be a combination of all possibilities.

Of the respondent, 69% (n = 322) had a problem getting supplies, such as gloves, masks, disinfectants, etc. and respectively 31% (n = 140) had no problem because they had the necessary quantities.

Most dentists (92%, n = 427) reported paying a drastically higher amount to supply the necessary PPE. At the beginning of the pandemic, there was a several-fold increase in the prices of these consumables, which was determined by their depletion in storage given their increased demand.

Regarding the frequency of hand disinfection while interacting with patients was as follows: 3% (n = 15) disinfect their hands before serving each individual patient, and 7% after serving each individual patient (n = 32). Based on the instructions hands must be disinfected before and after each individual patient, and this is practiced by 87% (n = 405). Entirely in contrast to the instructions were 1% (n = 6) who disinfected their hands several times a day; and 0.9% (n = 4) at the beginning and end of the working day.
Of the dentists, 17% (n = 77) said that they had disinfected their hands by washing them with soap and water, but this can definitely not be accepted as a method of disinfection and is extremely insufficient, especially in a pandemic. Over half (55%; n = 257) practiced the 6-step method using alcohol-containing disinfectants, which is the correct behavior, and 28% (n = 130) wiped their hands with disinfectant, without following a specific method, which hides the risk of missing the so-called “red zones” – between the fingers, fingertips, back of the thumb, etc. and 0.4% (n = 2) did not give an answer.
Asked how much time they spent on disinfecting of the hands 11% (n = 51) stated less than 15 seconds or less on disinfecting their hands, 57% (n = 265) gone under the recommended 30 seconds, and 32 .0% (n = 149) answered 1 minute or more, despite there was no such requirement.
Only 17% (n = 80) changed their medical mask for each individual patient, as recommended by the WHO, every 2 hours – 38% (n = 177). It is worrying that 37% (n = 173) change their mask once a day, and even less often (due to shortage) – 8% (n = 36).
About 2/3 (63%, n = 293) of the respondents changed their work clothes every day, which is the only correct behavior, as microorganisms contaminate and survive for different periods of time on surfaces, including work clothes, whereas 27% (n = 124) did it several times a week, but not every day. Once a week – 8% (n = 35), and 3% (n = 12) – when there were visible traces of blood and organic matter, 0.4% (n = 2) did not respond.
Majority (87%, n = 405) of dentists state that they were admitting patients without overlapping (15 mins or more in between). Patients were admitted closely one after the other, with a minimum overlap in 12% (n = 57) of cases. Patients overlapped and waited in the waiting room for an extended period at 1% (n = 4).
It is commendable that 90% (n = 420) followed the recommendations of the Ministry of Health on anti-epidemic measures, but 9% (n = 44) did not comply with them, and 0.4% (n = 2) did not give an answer.
Quite a high relative part (81%, n = 376) say that they felt they put their own health and that of their relatives at risk when working with patients due to the pandemic, and 8% (n = 37), respectively, did not have concerns. Lack of statement regarding the risk on their health due to work environment was observed in 11% (n = 54).
Only 39% (n = 182) did not have financial difficulties during the pandemic, but half of the respondents – 50% (n = 234) have had encountered such.
More than half of our survey participants estimate that their mental health is affected by the pandemic, and 31% (n = 143) did not think so, 10% were not sure (n = 48), and 0.2% did not answer.
More than half of the respondents (51.5%, n = 240) were afraid while working with patients, while 30.5% (n = 142) were not. No information about whether they were afraid or not was recorded by 7.8% (n = 83) of the surveyed.

Discussion

What was the state of dental care in Bulgaria at the beginning of the pandemic?
On its official website, the BDA publishes instructive materials according to which dentists should work(8):
The BDA recommends the development and adaptation of protocols for work and prevention in the context of the SARS-CoV-2 pandemic, as Order № RD-01-124 / 13.03.2020 by the Minister of Health does not prohibit the activities of dentists(9).

It is recommended to treat in medical institutions mainly urgent cases at their discretion, as well as avoiding work in an aerosol environment (turbines, scalers, etc.), or its refinement, and strict compliance with all rules of asepsis and antiseptics and proper use of personal protective equipment, described in the Recommendations / Instructions of the Crisis Staff of the BDA(10).

At the time of the study, all attempts by the state to fully ensure the work of dentists with disposable personal protective equipment, as well as disinfectants, were not entirely successful, as their shortage is ubiquitous.

What is happening in the world at the beginning of the pandemic:

In summary, the main recommendations in Australia, England, Zimbabwe, as well as the CDC and WHO include(11-16):

- Avoid performing unnecessary aerosol generating procedures (AGP) if possible. If AGP is required in this case, use eye protection and face protection. This includes the use of a particulate filter respirator (P2 or N95) or equivalent instead of a surgical mask, and healthcare professionals should be trained in their proper use, including how to perform suitability checks and safe removal. After AGP, the room must remain unoccupied for at least 30 minutes.

- Screening of patients by telephone about their health status, the presence of any symptoms of respiratory infection and specifically related to covid-19 infection, past/ recent trips, visits to restricted regions and countries, potential contacts with covid-19 patients

- During visits to the office, at the reception there should be suspension and denial of access to patients with symptoms, preventive disinfection of all surfaces with which the patient may have come into contact; removal of all literature from the waiting area; disinfection upon entry and exit of staff and patients with alcohol-based disinfectant; social distancing and avoiding the accumulation of patients in the waiting room and keeping a distance of at least a meter and a half.

- Before the procedure, rinse the mouth with an antiseptic solution, after the end of the procedure - thorough disinfection, ventilation and waiting for 15 to 30 minutes between patients.

Regarding the impact of the pandemic on the professional behavior of dentists and their financial and mental condition, a study in the UK3 shows that the majority of participants are very concerned that the pandemic is having a negative impact on their profession, while only 4.7 % have no worries. The main concerns related to financial problems and the ability to provide appropriate levels of care. More than 80% of respondents believe that the measures taken in their practice are in line with infection control procedures.

According to the results obtained in an Italian study(17), dental activity was reduced by 95% and was mainly limited to emergency procedures. The majority of respondents used additional personal protective equipment compared to the normal routine, although in a small number of cases there were reports of difficulties in obtaining the necessary protective equipment.

When surveying dentists in Turkey(18), more than 90% are concerned about themselves and their families. Only 12% wore an N95 mask. In conclusion, although Turkish dentists have taken some precautions, they have not done enough to protect themselves, dental staff and other COVID-19 patients as much as possible.

In Iran(19), the majority of dentists (n = 170, 70%) did not perform non-emergency procedures during the pandemic. Respondents suggested several strategies to reduce the risk of infection, such as reducing treatment sessions (n = 90, 37%), strict patient triage (n = 156, 64%) and the use of personal protective equipment (n = 108, 45%). However, most (n = 210, 87%) had problems providing personal protective equipment during the pandemic. In addition, 97% (n = 234) of the participants reported a reduction in their financial income after the pandemic. According to recommendations after the analysis of the results of the study, dentists could reduce their working hours and limit procedures, in the absence of urgency, to reduce the risk of transmission of COVID-19. In addition, public organizations must provide appropriate equipment for dentists to reduce the risk of infection.

A study of behavioral change due to COVID-19 among dental academics in different regions of the world(20) shows that COVID-19 has a significant psychological impact. A direct, interdependent change in behavior and concerns has been identified, but there is no link between these changes and public health emergency training. More behavioral changes are associated with lower mortality rates than COVID-19 in the country. Fear and stress are related to better perception and compliance with pandemic prevention measures
An analysis of the systemic and organizational measures implemented in the field of dental care in Hungary(21) in the first months of the Kovid-19 pandemic shows that systemic measures to promote social distancing, reduce the use of health services and to protection of high-risk health professionals, together with the introduction of protective equipment and the reorganization of patients' paths at the organizational level have proved effective. There are two, less frequently mentioned ingredients for successfully tackling the COVID-19 challenge. First, mental health support is at least as important as physical protection. Second, most interventions do not require large financial investments, but behavioral change, which in turn requires leadership and change management skills.
In a cross-sectional e-study on the knowledge, attitudes and professional behavior of dentists at COVID-19 in North America, Europe, the Eastern Mediterranean and the Western Pacific(22), the global comfort level score with preventive measures and treatment regulations during the COVID-19 pandemic is low (14 out of 30) and the differences between regions are significant (P <.01); Respondents reported a lack of readiness to counteract a highly infectious respiratory disease.
The pandemic affects not only dental practitioners but also patients, and some practitioners have reported a drop in visits, which is associated with additional stress and financial burdens. In China, thirty-eight percent fewer patients visited dental emergencies at the start of the COVID-19 epidemic(23). Statistical analysis showed a significant link between knowledge of COVID-19 transmission and fear of dental care (rs = 0.388, p <0.001)(24).
Both in Bulgaria and around the world, difficult access for various reasons, to dental services, leads to deteriorating dental health of the society as a whole.

Conclusion

The problems faced by dentists at the beginning of the pandemic were not an isolated case in Bulgaria alone, but similar problems have been reported in a number of studies around the world.
Covid-19 has put all aspects of people's personal lives and work around the world to the test, and dental practices are no exception.
Only strict adherence to the clear and unequivocal WHO recommendations (both on the anti-epidemic measures and on universal vaccination) would help to quickly deal with the pandemic, reduce financial losses as a result of disrupted work and logistics, save lives and help preserve the physical and mental health of people.

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