Volume 03, Issue 05 (November-December 2020), PP 31-39 **www.ijmsdr.org**
ISSN: 2581-902X

International Journal of Medical Science and Dental Research

Patient awareness regarding the availability of acute dental treatment during the COVID-19 pandemic in eastern Slovakia

Bolerázska Beáta[1], Frendáková Viktória[1], Vašková Janka[2]

[1](*Ist Department of Stomatology / Faculty of Medicine / Pavol Jozef Šafárik University in Košice / Slovak Republic)*
[2](*Department of Medical and Clinical Biochemistry / Faculty of Medicine /Pavol Jozef Šafárik University in Košice / Slovak Republic)*

Abstract: *With the onset of the COVID-19 pandemic, health care selection also began on the basis of its necessity in an effort to break the chain of infection transmission. Routine and planned dental care thus became unavailable at the time of the strictest measures, and only emergency care was provided. During the period of gradual relaxation of measures, we performed an evaluation of patients' awareness of measures related to acute dental treatment. Our findings show that, when such events occur, it is necessary to supplement the guidelines for healthcare providers with direct regional guidelines for the population, especially for general medicine, paediatrics and dentistry. The availability of health care and the timely management of acute health problems contribute to reducing complications and hospitalizations, including dental cases.*

Keywords - *COVID-19, dental treatment, emergency treatment, preventive examination, telemedicine, triaging*

I. INTRODUCTION

The rapid and difficult-to-control spread of coronavirus disease 2019 (COVID-19) triggered a global pandemic in the first half of 2020 that continues to this day. The causative agent is the new SARS-CoV-2 virus, a β-coronavirus, enveloped, non-segmented, positive-sense RNA virus from the subgenus *sarbecovirus*, and *Orthocoronavirinae* subfamily [1]. It is spread by droplets, respiratory secretions, and direct contact, causing acute respiratory disease even at low infectious doses [2,3]. However, the virus has also been detected in faecal swabs and blood, suggesting other transmission routes [4]. S-glycoprotein on the surface of SARS-CoV2 facilitates its entry into the cell via attachment to the angiotensin-converting enzyme 2 (ACE2) receptor on the surface of human cells [5,6], which are particularly abundant in lung alveolar epithelial cells and small intestinal enterocytes [7].

Dental practice involves close physical proximity to the patient's oropharyngeal region and the use of aerosol-generating procedures. Studies have shown that aerosols can lead to the spread of SARS-CoV over distances of more than six feet [8]. As there are no approved specific antiviral drugs for SARS-CoV-2 infection to date, preventive measures and inactivation of the virus are necessary to stop and control the spread of the disease [9]. Dentistry has therefore started to be considered a high-risk field due to characteristics of its practice. Taking this into account, the result was that, in general, COVID-19 led to the closure and shortening of dentists' office hours, with exception of emergency and emergency services, thus limiting routine care and prevention.

In the Slovak Republic, due to the surrounding outbreak of a pandemic, a state of emergency was introduced as a quick response on 16/03/2020 for state hospitals, which was then extended to the outpatient

sector, including dental clinics, which came into effect from 18/04/2020. The Slovak Chamber of Dentists (SCD) responded promptly to the situation and immediately published a set of recommendations for dentists on its website on 16/03/2020 to help prevent the spread of COVID-19 infection. These included requirements to publish a telephone contact for the dentist and to be available within office hours [10]. In situations where the patient could not get through, he had to be contacted back by the dentist/nurse. Part of these recommendations also covered models for dental procedures in the most likely situations for dental clinics, and there is no need for a detailed presentation of them in this publication. After this, regional recommendations were issued with guidelines for patients and physicians, which included information on who carries out the dental treatment of clinically healthy patients, quarantined patients with suspected COVID-19 disease and home treatment with a confirmed test for COVID-19, as well as where such treatments are carried out. Both recommendations were in an agreement and emphasized the importance of telephone support from the beginning of the pandemic, also emphasizing the importance of telephone support throughout the doctor's office hours and in this regards it was recommended to publish an available telephone contact in a visible location, doctors over 65 years old and pregnant doctors provided only telephone support, respecting a mutual system of substitution when one of them was absent. In cases where a doctor was placed in quarantine, patients were screened before entering the workplace according to symptoms and travel history. At the regional level, a recommendation was issued that patients without clinical signs of a respiratory infection and with a negative travel history be treated by the relevant dentist (possibly a substitute) and outside his office hours in the dental emergency room. Acute patients with a positive travel history in quarantine, with suspected or confirmed COVID, or with symptoms of this disease were treated in clinics. The doctor must make themselves available by telephone throughout their entire office hours, communicate with patients and resolve their further dental issues according to their severity.

At the beginning of the outbreak of the pandemic, we also found out whether patients opted for a telephone consultation with their regular doctor on their current difficulties, were undergoing treatment, or being provided with treatment. As we often received an unsatisfactory response from patients, in that patients either did not contact the doctor by phone or did not know how to proceed, we decided to address this issue in this study.

II. MATERIALS AND METHODS

In this study, an analysis was performed on the responses of patients who sought acute dental treatment at the most visited dental emergency room in eastern Slovakia in the period from 20/04/2020 to 31/05/2020. The study was approved by the ethics committee of the Faculty of Medicine of Pavol Jozef Šafárik University in Košice under the number 4N/2020. Before entering the building where the dental emergency service was provided on Toryská Street, patients were sorted on the base of their travel history and their body temperature was measured.

In our study period, the phases of the release of anti-epidemiological measures in Slovakia took place, which were originally planned in 4 basic steps. The first phase was started on 21/04/2020, the second (which, due to the favourable development of the situation, was combined with the third) on 06/05/2020 and the last on 20/05/2020. During this period, there were very few confirmed cases of COVID-19 (a total of 1496 in 42 days). During the entire period from 16/03/2020, we provided urgent dental care in our studied region, in accordance with the recommendations of the SCD regarding both protective and therapeutic procedures. Table 1 summarizes the procedures and number of treatments in the period from 16/03/2020 to the first phase of the release of strict measures on 21/04/2020. Table 2 shows the number and type of procedures provided during the stages of release of anti-epidemiological measures in the region of the second largest Slovak city, Košice.

738 patients (452 men, 286 women) were asked to complete the questionnaire, of which 248 agreed. The group consisted of 142 men and 106 women, with voluntary participation. We obtained the necessary data by distributing a questionnaire, which was filled in anonymously by respondents. We used a non-standardized questionnaire which was created based on our stated goals for patients with an acute illness. The questionnaire consisted of 6 questions, both open and closed. In terms of content, we focused on the characteristics of the target sample undergoing preventive examinations, with the first question determining whether the acute condition had been consulted in advance with the patient's regular dentist. We were also interested in informing patients about the representation of their district doctor and whether their doctor treats acute conditions during

the study period, whether there was a deputy dentist, if they were subject to annual preventive examinations, and the main reason for visiting the dental emergency room.

The statistical program IBM SPSS Statistics 25.0. was used for the evaluation and descriptive statistical analysis.

III. RESULTS

In the period from 20/04/2020 to 30/05/2020, a total of 738 patients (452 men, 286 women) visited the dental emergency room. Of these, 248 agreed to complete the questionnaire. The group consisted of 142 men and 106 women. Of all respondents agreeing to participate, 42 were aged 0-18; 113 aged 19-35; 55 aged 36-50; and 38 aged 51+. (Fig. 1). 16.9% of respondents fell into the 0-18 age group, making up 12.7% and 22.6% of the male and female respondents, respectively. The 19 to 35 group amounted to 45.6% of respondents, 51.4% of the total male respondents and 37.7% of the total female respondents. 22.2% of respondents were aged 36 to 50, amounting to 23.9% of the total male respondents and 19.8% of the total female respondents. The remaining 15.3% were aged 51 and over, making up 12% of the total male respondents and 19.8% of the total female respondents. Men were more willing to complete the questionnaire, and were shown to visit the dental emergency room more often than women. The 19 to 35 age category attends the dental emergency room most often. Men aged 19-35 were the most represented in the observed sample of respondents.

Another monitored criterion was the completion of annual dental preventive examinations with regard to the age and sex of the respondents. In our study group, 53% of men confirmed the completion of a preventive examination last year, 38% of men did not complete the preventive examination and 9% were unsure. For women, 59% underwent a preventive examination, 25% did not undergo an annual preventive examination and 15% of women were unsure (Fig. 2). The completion of dental preventive examinations was different for men and women and for the different age groups. Of the total number of respondents, women came for an examination more often than men, which is in line with the assumption that women approach oral health more responsibly, even though a higher percentage of them did not remember whether they underwent a preventive examination. Patients went for dental examinations most responsibly between the ages of 36-50, 66.7% of women and 70.6% of men. Men over the age of 51 neglected dental examinations the most, at 47.1%. The age groups over 51 and from 19-35 underwent preventive examinations the least. Given that respondents aged 19-35 most often visited the emergency room, this could mean that failure to undergo preventive check-ups leads to the development of acute diseases in this age group.

In assessing patients' awareness of whether their dentists were working during office hours and treating acute cases, and whether they were informed of their dentist's deputy during the COVID-19 pandemic (Fig. 3), we found that approximately half of the respondents (52.4%) were informed whether their doctor treated acute cases, 13.7% were unsure and 33.9% did not look for that information. As for information about the deputy doctor, approximately half of the respondents (49.2%) did not have information about the deputy of their dentist, the other half of the respondents were informed about the deputy dentist, of which 25.8% knew who the deputy doctor was. The remaining 25% knew that their dentist did not have a deputy dentist, meaning that no one worked in his outpatient clinic, nor had the dentist provided information (on the door or website) on where they could get dental treatment. We also found gender differences. Only half of the men (50%) were sure at the time of the pandemic that acute treatment was also performed by their dentist. 15% of men were unsure or assumed that their doctor did not work, but had not checked, and 35% did not have information on where to get dental treatment.

Half of the women (46%) were sure of their awareness of dental treatment. 11% of women had not checked the information about the treatment, and 33% did not have enough information. 30% of women, compared to 23% of men, were better informed about the deputy dentist. 53% of men and 43% of women did not have information about a deputy dentist. Only half of the men and women surveyed felt sufficiently informed about the office hours of their dentist during the pandemic. Overall, more information regarding dentists' office hours was obtained by women than men.

The final goal was to find out whether respondents had had a telephone consultation with the doctor before coming to the dental emergency room. If they had not had a telephone consultation with a doctor, we determined from the respondents the reason for not taking the recommended phone consultation; if respondents

had consulted the doctor by phone, the doctor's recommendations were noted (Fig. 4). A total of 192 (77.4%) respondents had not conducted a telephone consultation, while only 56 (22.6%; 32 men and 24 women) respondents had. The most common response from respondents who had not consulted a doctor was "that pain was not yet present during the consultation (office)", while the most common response from respondents who had consulted the doctor was "that the doctor told me to come the following day, but I couldn't stand it anymore".

IV. DISCUSSION

As in other countries, the community of dentists in Slovakia was caught unprepared in mid-March by the spreading coronavirus infection. According to a study by Xu et al. [11], the reason for introducing and maintaining the preventive measures in dentistry was the potentially high risk of oral infection by COVID-19 due to the expression of ACE2 receptors on the oral mucosa and, in particular, the epithelium of the tongue. As dentists are in very close contact with patients, they are at a much higher risk of COVID-19 infection than general practitioners or nurses [12]. The most recommended guideline for dentists was to avoid scheduling any patients. This involved considering only urgent dental diseases, thus limiting interpersonal contact, patients' waiting time, and in general, limiting the conditions predisposing patients to infection [13]. From 16th March 2020, strict restrictions on social contact went into effect in our country. In particular, the healthcare sector was under pressure to prepare for a likely increase in the number of infected patients, and so recommendations were issued for various medical departments, including dentistry. As the increase in the number of infected people was not so severe, strict social measures were relaxed every 2 weeks, but the recommendations for medical procedures remained in place. The published guidelines mainly concern the protection of the health of the doctor and the patient, the procedures for performing the treatment, the classification of patients according to the urgency of the treatment, etc. As the study of Guo et al. [14] has pointed out, there was a decrease in 38% of patients visiting dentists at the beginning of the COVID-19 outbreak. This shows that the frequency of visits to the dental office changed elsewhere. However, there were also changes in the distribution of dental issues, and an almost 20% increase in dental or oral infections during COVID-19.

In our study group, we found out the respondents' awareness of whether their regular dentist provides office hours during a pandemic, and whether there was a deputy dentist or a recommendation on where to get dental treatment. This topic proved to be very necessary, as a study by Oliveira and Zanatta [15] has indicated that between March 23 and May 4, people increasingly relied on social media for information about dental pain, emergencies and orthodontic treatment.

During the study period, the limited availability of dental treatment was exacerbated by the SCD's recommendation not to have office hours for dentists over 65 years of age. Together with the high average age of dentists in the country, the uneven network of providers, and the virtual absence of protective equipment providing higher levels of protection, this led to a shortage of available dentists. We found that approximately half of the respondents did not have information regarding dentists' availability, despite the fact the duties of dentists included, in addition to ensuring access to urgent dental care during normal working hours, ensuring adequate dissemination of information to patients on how to obtain it. The priority of doctors in all specialties, including dentists, was to provide mainly telephone support to patients in that period (March, April, May 2020) and to perform only necessary examinations and treatments in shortened office hours from 08:00 to 12:00, follow epidemiological recommendations, publish telephone numbers and e-mail addresses, and be available during approved office hours.

The practice of teledentistry is not a new idea; it has expanded since 1994 [16] and replaces real-time consultations in areas with limited access to facilities, or in long-term healthcare facilities [17, 18]. In the current COVID-19 pandemic, its incorporation into daily dental practice is desirable mainly with regard to the remote triaging of patients suspected of COVID-19, reducing the risk of exposure to healthy patients, as well as overcrowding in medical facilities [19]. We have found the implementation of teledentistry depends, in particular on people's interest in information about the available forms of dental care, which is generally low, unless they are directly forced to look for it in emergency situations.

We were also interested in what percentage of this population underwent regular preventive check-ups. We focused on discovering differences in gender and individual age categories.

From our research, we have found that women attended regular preventive check-ups more often than men. Preventive examinations were mostly neglected by those in the over-51 age category and in the 19-35 age range. However, we also found that the 19-35 age group visited the dental emergency department the most, which was true for both male and female respondents. In this way, we revealed a potential risk group that probably neglects oral health the most. As the fight against this infection requires an incredible worldwide effort and we are far from winning it, an analysis of the data obtained so far in connection with it is necessary. Our findings show that, when such events occur, it is necessary to supplement the guidelines for healthcare providers with direct regional guidelines for the population, especially in general medicine, paediatrics and dentistry. However, the position of dentistry is exceptional in this area, as acute conditions in the vast majority of cases cannot be addressed via telemedicine. The continual provision of dental care is based on the need to provide patients with access to emergency dental care, especially in such situations where government measures are tightened and primary care services become unavailable.

V. FIGURES AND TABLES

To ensure a high-quality product, diagrams and lettering MUST be either computer-drafted or drawn using India ink.

Figure captions appear below the figure, are flush left, and are in lower case letters. When referring to a figure in the body of the text, the abbreviation "Fig." is used. Figures should be numbered in the order they appear in the text.

Table 1. Numbers of treatments at the beginning of the pandemic in our region.

16/03/2020 – 20/04/2020 (36 days, 677 patients)	Number of procedures	%
Permanent tooth extraction	403	49
Local treatment of gingiva or mucosa	147	18
Treatment and check up after dentoalveolar surgery	102	12
Trepanation	62	8
Abscess incision	46	6
Treatment of deep caries	29	4
Surgical wound revision	11	1
Treatment of difficult 4th molar cutting	17	2
Deciduous tooth extraction	4	1

Table 2. Number of dental treatments during the release phases of the anti-epidemiological measures.

20.04.2020 - 31.05.2020 (42 days, 771 patients)	Number of procedures	**%**
Permanent tooth extraction	410	50
Local treatment of gingiva or mucosa	167	19
Trepanation	157	19
Absces incision	34	4
Treatment of deep caries	23	3
Surgical wound revision	14	2
Treatment of difficult 4th molar cutting	14	2
Deciduous tooth extraction	5	1

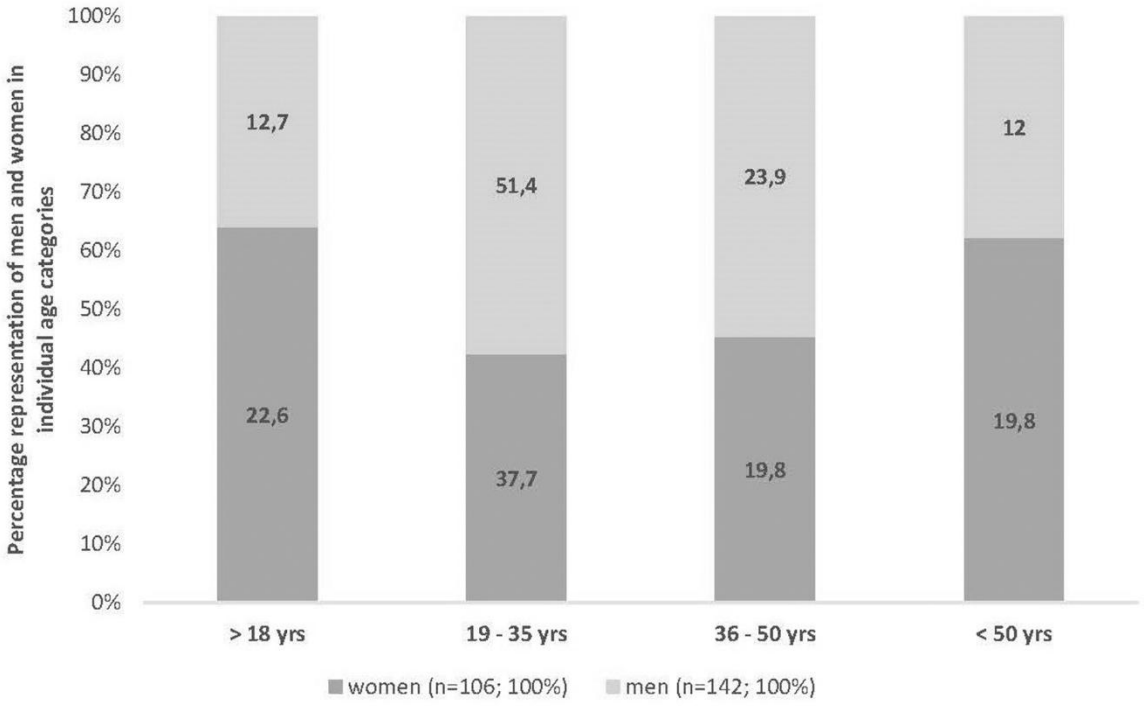

Fig. 1 Characteristics of age distribution in the group of respondents.

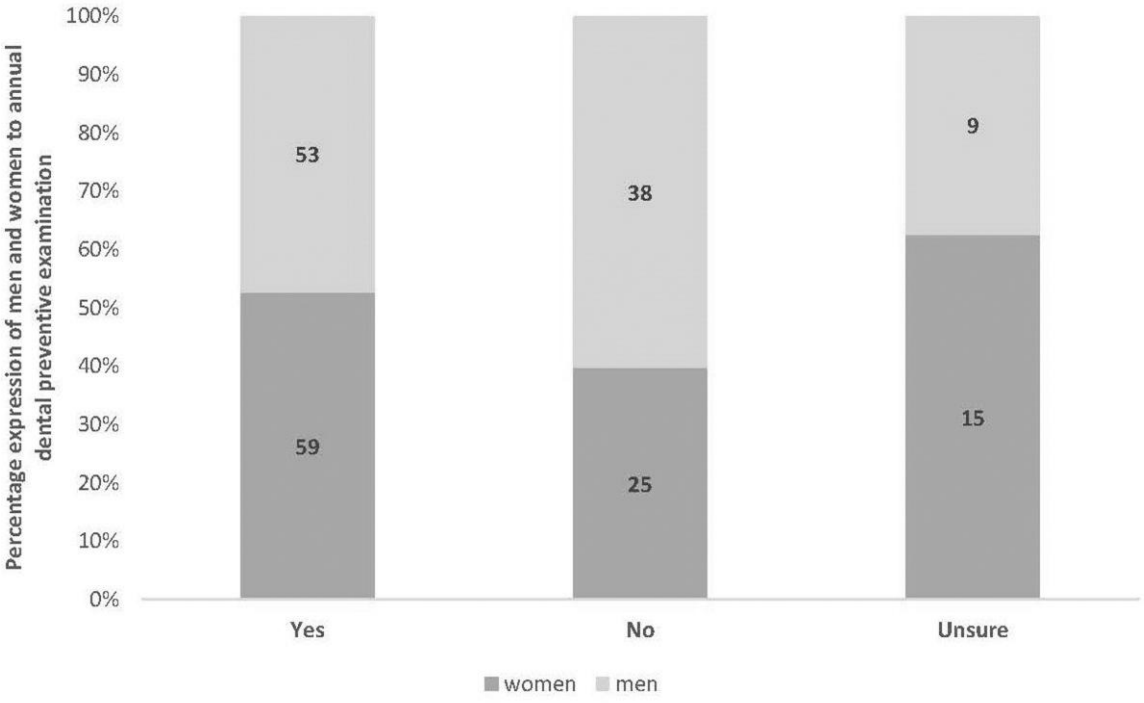

Fig. 2 Evaluation of answers about annual preventive examination in men and women of different age groups.

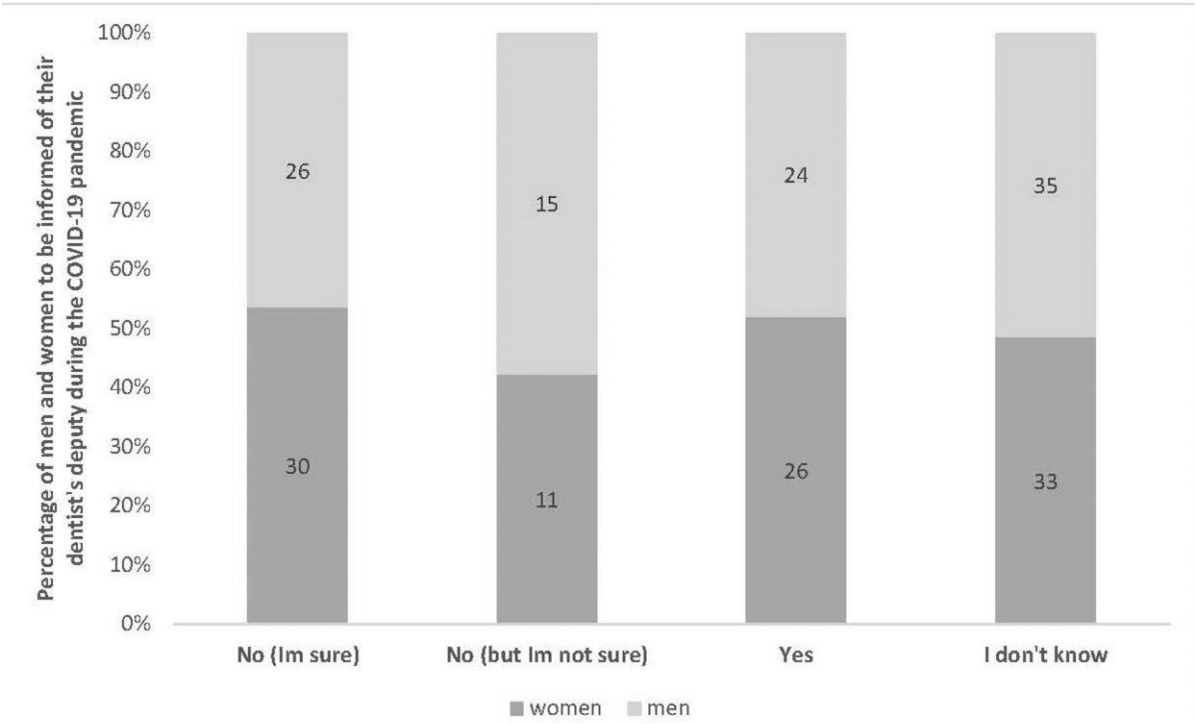

Fig. 3 Patients' awareness of their dentist's deputy during the COVID-19 pandemic

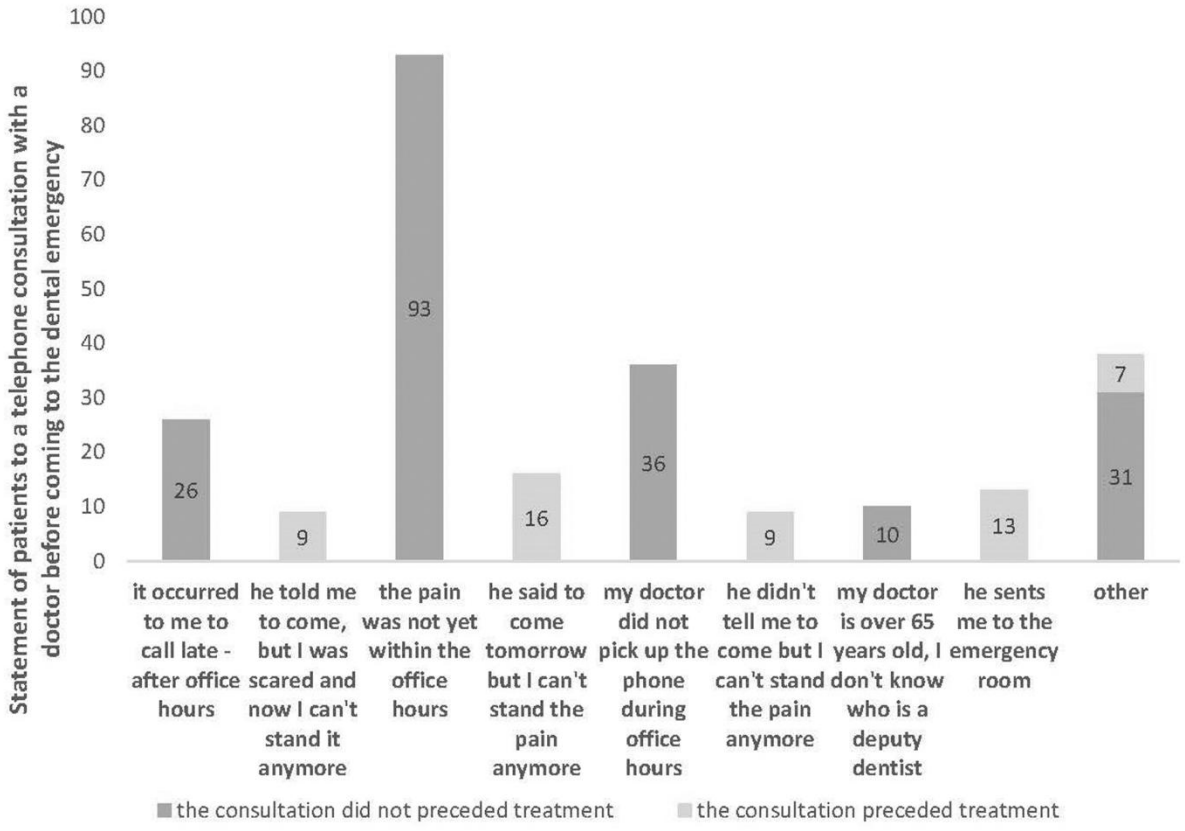

Fig. 4 Frequency of consultation by phone before emergency treatment.

VI. CONCLUSION

The study period did not start at the beginning of the pandemic, and not all respondents answered the selected questions, nor was it possible to provide a control group of patients for whom we could be sure of their awareness. The questionnaire was offered to everyone but was only completed by those who agreed. Furthermore, it was difficult to check the reliability of the answers in relation to doctors who were obliged to provide telephone support during this period and to treat their patients during office hours. However, the effects of the COVID-19 pandemic on dentistry have inevitably led to a rapid change in the model of emergency dental services. As morbidity comes in waves and each state, and even local regional areas are currently at different stages of pandemic development, a rapid transition in the type of healthcare provision is essential, especially in dentistry, which is most at risk for cross-infection.

Acknowledgements

The study was supported by grant VEGA 1/0559/18.

REFERENCES

[1] Z. Zhu, D. Zhang, W. Wang, X. Li, B. Yang, J. Song, et al. A novel coronavirus from patients with pneumonia in China, 2019. *The New England Journal of Medicine, 382 (8)*, 2020, 727–733.

[2] Q. Li, X. Guan, P. Wu, X. Wang, L. Zhou, Y. Tong, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *The New England Journal of Medicine, 382 (13)*, 2020, 1199–1207.

[3] P.I. Lee, P.R. Hsueh. Emerging threats from zoonotic coronaviruses-from SARS and MERS to 2019-nCoV. *Journal of Microbiology, Immunology and Infection, 53 (3)*, 2020, 365–367.

[4] W. Zhang, R.H. Du, B. Li, X. S. Zheng, X.L. Yang, B. Hu, et al. Molecular and serological investigation of 2019-nCoV infected patients: implication of multiple shedding routes. *Emerging Microbes & Infections, 9 (1)*, 2020, 386–389.

[5] M.A. Tortorici, D. Veesler. Structural insights into coronavirus entry. *Advances in Virus Research, 105*, 2019, 93–116.

[6] P. Zhou, X.L. Yang, X.G. Wang, B. Hu, L. Zhang, W. Zhang, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature, 579*, 2020, 270–273.

[7] I. Hamming, W. Timens, M.L. Bulthuis, A.T. Lely, G. Navis, H. van Goor. Tissue distribution of ACE2 protein, the functional receptor for SARS coronavirus. A first step in understanding SARS pathogenesis. *The Journal of Pathology, 203 (2)*, 2004, 631–637.

[8] J.S. Kutter, M.I. Spronken, P.L. Fraaij, et al. Transmission routes of respiratory viruses among humans. *Current Opinion in Virology, 28*, 2018, 142–151.

[9] Infection Prevention and Control During Health Care when Novel Coronavirus (nCoV) Infection, is Suspected: Interim Guidance. World Health Organization, Geneva, Switzerland. https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125 [Accessed on Sept. 20, 2020].2020.

[10] Odporúčania SKZL - zubní lekári. https://www.skzl.sk/zubni-lekari [Accessed on Oct. 06, 2020] 2020.

[11] H. Xu, L. Zhong, J. Deng, J. Peng, H. Dan, X. Zeng. High expression of ACE2 receptor of 2019-nCoV on the epithelial cells of oral mucosa. *International Journal of Oral Science, 12 (1),*2020, 1–5.

[12] L. Gamio. The Workers Who Face the Greatest Coronavirus Risk. Available online: https://www.nytimes.com/interactive/2020/03/15/business/economy/coronavirus-worker-risk.html?action=click&module=Top+Stories&pgtype=Homepage [Accessed on Oct. 10, 2020].

[13] G. Spagnuolo, D. De Vito, S. Rengo, M. Tatullo. Covid-19+ outbreak: An overview on dentistry. *International Journal of Envrironmental Research in Public Health, 17 (6),* 2020, 2094.

[14] H. Guo, Y. Zhou, X. Liu, J. Tan. The impact of the COVID-19 epidemic on the utilization of emergency dental services. *Journal of Dental Science, https://doi.org/10.1016/j.jds.2020.02.002,* 2020.

[15] L.M. Oliveira, F.B. Zanatta. Self-reported dental treatment needs during the covid-19 outbreak in Brazil: an infodemiological study. *Brazilian Oral Research, 34*, 2020, e114.

[16] M.A. Rocca, V.L. Kudryk, J.C. Pajak, T. Morris. The evolution of a teledentistry system within the Department of Defense. *Proceedings of the AMIA Symposium,* 1999, 921–924.

[17] J.H. Alabdullah, S.J. Daniel. A systematic review on the validity of teledentistry. *Telemedicine Journal and e-Health, 24 (8),* 2018, 639–648.

[18] M. Estai, Y. Kanagasingam, M. Tennant, S. Bunt. A systematic review of the research evidence for the benefits of teledentistry. *Journal of Telemedicine and Telecare*, *24 (3),* 2018, 147–156.

[19] S. Ghai. Teledentistry during covid-19 pandemic. *Diabetes and Metabolic Syndrome, 14 (5),* 2020, 933–935.