



Oral health, the patients' perspective during the COVID 19 pandemic

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Abstract

Background and aims. On March 16, 2020, the state of emergency was established with drastic measures of isolation and quarantine. Among the measures taken in the context of the state of emergency was the closure of dental offices throughout the country. The aim of our questionnaire-based cross-sectional study was to identify the psycho-affective implications of the Romanian citizens induced by the COVID-19 pandemic period as well as their opinion related to the self-perceived oral health status during this period.

Methods. An original questionnaire was designed consisting of 41 questions, which were distributed to the general population via the Internet. The first part of the questionnaire investigated the respondents' opinion regarding the impact of this COVID-19 pandemic period of isolation on their oral health and the attention paid by the subjects to oral hygiene during restrictions. The second part refers to their addressability to the dental services during this pandemic and the third part interrogates different characteristics, namely the presence of comorbidities, possible anxiety, and stress.

Results. A total of 769 participants answered the questionnaire online.

Conclusion. According to their responses most of the respondents were not afraid of the possibility of contracting Sars-Cov-2 during dental treatments, but were in certain periods deprived of accessing dental services due to lockdown restrictions. They are aware of their oral health problems and pay more attention to oral hygiene so that they do not get worse during restrictions.

Keywords: COVID-19, dental care accessibility, lockdown restrictions, psychological stress, self-perceived oral health

Background and aims

On March 11, 2020, the COVID-19 pandemic was declared by the WHO. On February 26, 2020, the first case of coronavirus in Romania was confirmed. Romania has been exposed to COVID-19 due to the dynamics of Romanian citizens' land and air traveling from Italy and Spain. Over 2 million Romanian citizens have been working legally abroad in recent years. Between February and April 2020, more than 1.3 million Romanian citizens came in Romania from the red zones (especially Italy and

Spain), facing the country's government with a great health challenge [1]. Among the reasons for the return to Romania of such a large number of Romanian citizens were: the loss of jobs and the fear of contagion in the red areas (where they worked), as well as the approach of the Easter holidays. Consequently, the state of emergency was established with drastic measures of isolation and quarantine. By March 14, 2020, in Romania, 102 cases of people infected with Sars-Cov-2 virus (coronavirus) were confirmed. COVID-19 has the potential to cause severe acute

DOI: 10.15386/mpr-2553

Manuscript received: 02.07.2022

Received in revised form: 19.08.2022

Accepted: 31.08.2022

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respiratory tract infection among infected humans and is commonly transmitted from person to person via hands, saliva, nasal droplets, and surface contacts [2].

On March 16, 2020, a state of emergency was decreed in Romania for 30 days. Among the measures taken in the context of the state of emergency was the closure of dental offices throughout the country. Exceptions were the regional dental offices from Emergency Care Units (Urgent Dental Care (UDC) hub) and private offices that showed their availability and approval of the College of Dentists to provide emergency dental care (which refers exclusively to the treatment of severe pain, infection or bleeding, dental fractures causing pain or soft-tissue injuries caused by trauma, luxation, dental avulsions [3]) at the same time fulfilling the additional conditions for the control of COVID-19 infection (having the required Infection Control Protocols and Personal Protective Equipment requirements in place). Apart from these private offices and UDC centers, all private offices have been closed since March 16.

In Romania, 90% of dental care is offered by private practices. Along with these, there are public dental offices, school dental offices (which usually serve several schools) and within medicine and pharmacy universities. A previous study showed the impact of COVID-19 pandemic generating significantly higher number of acute apical periodontitis, abscess, and acute pulpitis treated in the Emergency Department of County General Hospital and "Iuliu Hațieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania, the only dental service available in the region in April 2020, compared with April 2019. The authors concluded that the COVID-19 pandemic could further impact the oral health and quality of life of patients [4]. All over Europe, but also in the world, COVID-19 pandemic impacted the general population in terms of stress and anxiety, but also population's health not necessarily because of the problems associated with Sars-Cov-2 infection, but rather because of restricted access to medical services. Other studies reported that oral health inequalities have widened due to the COVID-19 pandemic in England because many oral health programs in schools and care homes were disrupted or suspended throughout this period [5]. During the first wave of the COVID-19 pandemic in Germany depression and anxiety level was mild to moderate. COVID-19 history and aggravated levels of depression, anxiety, and stress seem to associate with lower oral health-related quality of life [6]. In the United States a widespread decline in oral health status and access to oral health care among children was reported, from July 2020 until January 2021, during the COVID-19 pandemic [7].

So far, no survey has been conducted in Romania in relation to citizens' perceptions of the consequences of the COVID-19 pandemic on the possibility of contracting the disease in dental offices, access to dental services and patient availability to request these services, self-perceived

oral health, telephone access to dentists, ways to relax and economic implications.

The aim of our questionnaire-based cross-sectional study was to identify the psycho-affective implications of the Romanian citizens induced by the COVID-19 pandemic period as well as their opinion related to the self-perceived oral health status during this period.

Methods

An original questionnaire was designed consisting of 41 questions, which were distributed to the general population via the Internet. The questionnaires were filled in a Wordpress Forms application, sent through an internet browser, and stored on a private server. This questionnaire addressed to the Romanian population (in Romanian language) aimed to assess the psycho-emotional implications and self-perceived oral health changes that occur in the general population regarding the period of isolation, quarantine, and the impact on the oral health conditions. Subjects were not required to answer all questions. The digital link was initially distributed to patients of 5 dental offices from North-West Transylvania, Romania. The link of the questionnaire form was also sent through social media networks to reach the general population of Romania with the intention of reaching as many people of all ages as possible. The study protocol was approved by the Research Ethics Committee of the University of Medicine and Pharmacy Iuliu Hațieganu Cluj-Napoca, Romania, and was authorized having approval no 25 / 27.02.2020. Written informed consent was obtained from all participating adults when completing the questionnaire and no minors were involved in this study.

The questionnaire had 3 parts:

- a. The first part investigated the respondents' opinion regarding the impact of the COVID-19 pandemic period of isolation on the oral health, the attention paid by the subjects to oral hygiene during quarantine.
- b. The second part of the questionnaire refers to their addressability to the dental services during this pandemic.
- c. The third part of the questionnaire interrogates different characteristics, namely the presence of comorbidities, possible anxiety and if having and walking a dog might be a solution to lower stress and anxiety.

The questionnaire was anonymous, requesting at the end its completion with sociodemographic data regarding profession, weight, smoker or non-smoker status and whether the respondent had had COVID-19.

The statistical analysis was performed using Stata BE 17.0. Associations between categorical variables were assessed using Pearson's chi-squared test. Group differences were evaluated using the Mann Whitney U test and the Kruskal-Wallis Rank Sum Test, for which the pairwise comparisons were performed using Dunn's Kruskal-Wallis Multiple Comparisons, with the Bonferroni adjustment.

Results

A total of 769 participants (69.98% women, 30.12% men) answered the questionnaire online. The age distribution is represented in Figure 1, for women it ranged between 18 and 88 years old (mean 37.4, median 33) and for men it ranged between 18 and 76 years old (mean 41, median 34).

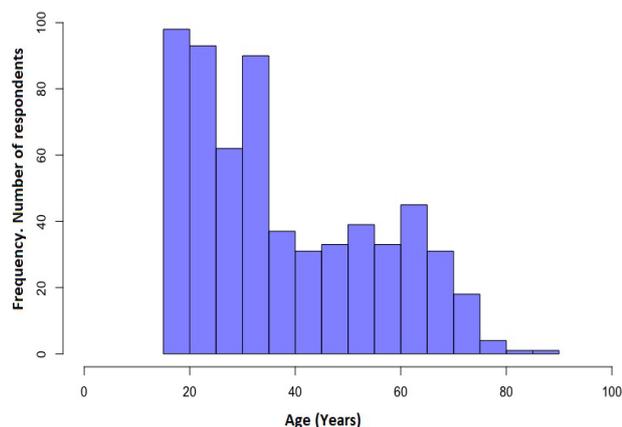


Figure 1. Subjects' age distribution.

64.3% from the respondents were non-smokers, 24.33% active smokers and 11.36% former smokers. For the females the mean height was 1.65 m, mean weight 65.5 kg and female smokers reported a mean of 9.63 cigarettes

smoked/day for more than 11.2 years. For the male respondents the mean height was 1.79 m, mean weight 85.5 kg and for male smokers a mean of 14 cigarettes smoked/day for more than 19.1 years (Table I). Most of the smokers smoked between 5 – 20 cigarettes/day between 10 – 20 years (Figure 2).

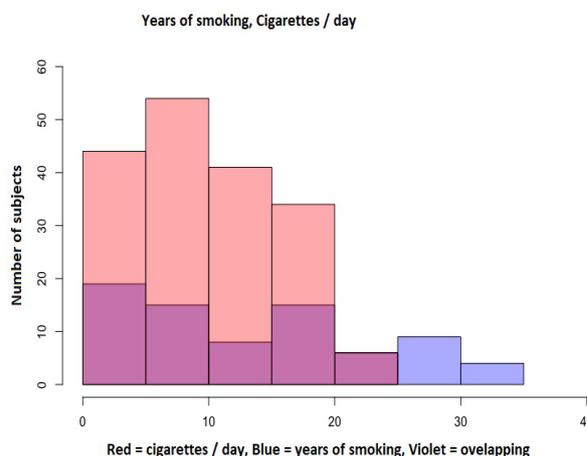


Figure 2. Subjects distribution for number of cigarettes / days, years of smoking.

39.92% declared that they finished secondary or high school and 60.08% declared that they graduated from university.

Table I. Respondents' characteristics regarding age, height, weight, and smoking.

Sex	Variable	Mean	p50	Min	Max	Range	IQR	Variance	SD
Female	age	37.4	33	18	88	70	28	278	16.7
	weight	65.5	64	40	138	98	16	164	12.8
	height	1.65	1.65	1.24	1.83	.59	.09	.00384	.062
	Years as a smoker	11.2	9	1	30	29	15.5	64.5	8.03
	Cigarettes/day present	9.63	10	1	24	23	9	33.1	5.75
	Years since quit smoking	6.83	4	1	29	28	9	50.1	7.08
	Cigarettes/day past	9.47	7.5	2	20	18	11	36.5	6.04
Male	age	41	34	18	76	58	35	320	17.9
	weight	85.5	84	50	140	90	15	196	14
	height	1.79	1.8	1.6	2.03	.43	.09	.00514	.0717
	Years as a smoker	19.1	19.5	1	35	34	20	114	10.7
	Cigarettes/day present	14	14.5	3	25	22	10	35.3	5.94
	Years since quit smoking	11.1	9	1	30	29	13.5	72.2	8.5
	Cigarettes/day past	15.5	14	4	44	40	10.5	83.3	9.13
Total	age	38.5	34	18	88	70	29	293	17.1
	weight	71.8	70	40	140	100	20	261	16.1
	height	1.69	1.68	1.24	2.03	.79	.125	.00901	.0949
	Years as a smoker	14.4	12.5	1	35	34	17	98.5	9.92
	Cigarettes/day present	11.1	10	1	25	24	9	38	6.17
	Years since quit smoking	8.38	6	1	30	29	11	61.4	7.84
	Cigarettes/day past	12	10.5	2	44	42	11	64.3	8.02

a. The impact of COVID-19 pandemic period of isolation on the oral health, the attention paid by the subjects to oral hygiene during quarantine

9.46% declared that they had mobile teeth, 5.95% that the teeth changed their position, 12.05% reported gingival congestion, 12.43% brushed their teeth after every meal, 78.28% twice a day and 9.29% maximum once per day. 48.47% reported using daily interdental oral hygiene methods, 19.52% using them occasionally, 13.68% weekly, 0.53% monthly and 17.80% never. Flossing is the most used interdental oral hygiene mean, reported by 46.26%. 35.71% used interdental brushes and 18.03% both auxiliary oral hygiene means. 14.48% reported gingival bleeding from time to time, while 12.22% reported gingival bleeding during tooth brushing, 46.25% reported it rarely (once a month). 8.40% reported gingival bleeding during interdental cleaning, 54.67% rarely during interdental cleaning (once a month).

There is a statistically significant age difference between the respondents who declared the self-perception of the bad breath (Mann-Whitney test; 38 median age for the respondents perceiving the bad breath and 33 median age for the respondents not perceiving the bad breath; $z = 2.474$; $p = 0.0133$; 55.5 median age for the respondents in which the entourage signals the bad breath and 32 median age for the respondents in which the entourage does not signal the breath; 53.5 median age for the respondents declaring gingival bleeding and 32 median age for the non-gingival bleeding respondents; 12 median cigarettes/day for the ones that perceives the bad breath and 10 median cigarettes/day for the ones that does not perceive the bad breath; men are more likely to be in the category of “never using interdental oral hygiene means”. Active smokers are more likely not to engage in physical activity. Those with lower education are more likely to be in the “never using interdental oral hygiene means” category.

b. Addressability to the dental services during COVID-19 pandemic

Most of the respondents (48.93%) preferred to address their dental emergencies to a private emergency dental office, while 39.07% chose just to call the dentist and 12% preferred a public emergency dental office. 37.42% avoided to go to the dentist even if they had an emergency during COVID-19 pandemic period.

There is a statistically significant age difference between the defined groups of avoiding addressability to dental services due to a dental emergency (Mann-Whitney test; 43.5 median age for the group that would avoid addressing the emergency and 29 median age for the group that would not avoid addressing the emergency; preferences in case of a dental emergency (Kruskal – Wallis test); the “public dental office” is preferred for a median age value (58 years old) significantly higher than the “private dental office” groups (30 years old) and “remote solution, just calling the dentist” (35); Men are more likely to choose a

public service; Those with lower education are more likely to use a public service;

c. Characteristics, namely the presence of comorbidities, ways adopted by them to cope with the period of isolation, possible anxiety and if having and walking a dog might be a solution to lower stress and anxiety

Most of the participants declared that they complied with the COVID-19 pandemic restrictions - 95.90%. 52.05% were more worried about oral health during pandemic restrictions, 36.16% did not worry and 11.79% never thought about it. 55% were more preoccupied of oral hygiene during this period, while 35.26% did not and 9.74% never thought about it.

Half of the respondents were afraid of oro-dental health complications during restrictions, 45.18% did not and 4.76% never thought about it. Most of the participants (47.04%) were not afraid of getting Sars-Cov-2 infection during dental treatments, 36.79% were afraid and 16.17% never thought about it. 7.48% declared having dental emergencies during the COVID-19 Pandemic period.

From all the subjects 3.64% reported bronchial asthma, 4.81% autoimmune disorders, 3.25% got infected with Sars-Cov-2 during that period, 1.87% were diagnosed having Type 1 diabetes, 11.90% Type 2 diabetes, 8.71% dyslipidemia, 18.73% high blood pressure.

20% of the respondents are dog owners and among them 12% are the only person that is walking that dog. 34.98% of them are actively and frequently walking the dog, 29.66% do not walk the dog and 22.43% reported that the dog is not walked. 44.95% of dog owners who walk it actively or exclusively are worried about possible oro-dental health complications that can occur during the pandemic. The percentage is lower compared with 52.05% of all the subjects worried about potential oral health related problems during pandemic.

People with hypertension are more likely to have spontaneous gingival bleeding, statistical significance: Pearson $\chi^2 = 74.8109$; 1 degree of freedom; Cramer's $V = 0.3228$ - average degree of association; $p = 0.000$.

Discussion

In Romania, there were severe restrictions during the lockdown which led to the complete closure of private dental services from March, until May 2020. 7.48% from the respondents had dental emergencies during the pandemic period and 37.42% avoided to go to dentist even so. A higher percentage compared to US population where 41% of adults from 5,412 participants, aged between 18 and 90 years old, 50.8% females and 49.2% males, had delayed or avoided medical care including urgent or emergency care (12%) and routine care (32%) [8]. For the majority of the patients it was very difficult to attend dental services even for emergencies in many parts of the world [5,6,9]. 39.07% of our subjects preferred just to call the

dentists and only 12% preferred the public dental services in case of dental emergency. Specific public clinics were designated to provide urgent dental treatment for these patients in our country but also abroad [10].

14.48% of the participants from our study reported gingival bleeding from time to time, while 12.22% reported gingival bleeding during tooth brushing and 46.25% reported it rarely during tooth brushing (once a month). Ciardo et al. reported no bleeding for 63% of the patients who had greater emotional burden due to COVID pandemic, 33% gum bleeding sometimes, a percentage almost double compared with our results and 2% of their patients reported often spontaneous gum bleeding [6].

In our study, the patients' bad breath and gingival bleeding were statistically correlated with smoking and age. Oral health problems tend to remain unresolved because dental services in our country have been restricted due to the pandemic. We consider the same, as other authors, that the delay of non-emergency dental service will have a potential impact on the experience, cognition, treatment and rehabilitation of patients with oral diseases [11].

Aminot et al. showed us that dog owners reported higher vitality and life satisfaction and lower loneliness and COVID-related impacts [12]. In our study 44.95% of dog owners actively involved in its care were worried about potential oral health problems during pandemic restrictions, a lower percentage compared with 52.05% of the general population. This may show that the stress and worries of dog owners are lower.

Limitations of the study. The number of participants and the fact that the questionnaire was sent exclusively online may induce some degree of error. Only people with a high level of education and younger are willing and able to participate in such a study, which can be seen in the distribution of subjects by education: over 60% university studies. In the future we would like to extend the study by analogous completion of the questionnaire distributed in various population groups including less educated people.

55% of the subjects were more preoccupied by oral hygiene during this period possibly due to the generated stress by the limited access to dental treatments. Similar with the findings of Liu et al. that the children in Wuhan became more active in brushing their teeth during COVID-19 outbreak [13].

Conclusions

Most of the respondents were not afraid of the possibility of contracting Sars-Cov-2 during dental treatments but were in certain periods deprived of accessing dental services due to lockdown restrictions. They are aware of their oral health problems and pay more attention to oral hygiene so that they do not get worse during restrictions. Most patients comply with the restrictions imposed, but for their long-term oral health it

would be better if restrictions will be linked to efficient infection control protocols rather than to total closure of dental practices.

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