

PRECAUTIONARY MEASURES IN DENTAL FIELD TO FACE ANY FUTURE INFECTIOUS CRISIS

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ABSTRACT

Aims: Determine the effective precautionary measures at the levels of university staff members at faculty of dentistry, dental clinicians, and dental students to face any future infectious crisis.

Methodology: A questionnaire-based cross-sectional study was conducted among 480 subjects (70 university staff members, 60 dental clinicians, and 350 dental students). An electronic questionnaire was sent to the participants. It included different proposed measures to face any infectious future crisis. The response for each close-ended question was either effective, partially effective, or non-effective.

Results: On the level of university staff members, the predominant percentage of participants (95.7%) reported that developing a future plan is the most effective measure. While, on the level of dental clinician and dental students the most effective measure was creating a free treatment unit (90%,91.5 respectively).

Conclusion: The most effective measures to face any future infectious crisis in the dental field are developing a future plan and rapid response with establishing a crisis management unit in addition to the presence of a free treatment unit and guidance protocol.

KEYWORDS: Infectious crisis, pandemic disease, oral health planning

INTRODUCTION

Infectious disease emergencies are situations caused by biological agents such as viruses or bacteria with the potential to cause serious manifestation as significant illness or death in a large population. The Infectious Disease Emergencies Response (IDER)

Plan is implemented in case of naturally occurring outbreaks (measles, mumps, meningococcal disease), emerging infectious diseases (SARS, pandemic influenza, and SARS-CoV-2). The circumstances of infectious disease emergencies vary depending on many factors, including the type of biological agent, the scale of exposure, mode

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of transmission. It is highly important to contain outbreaks by effective public health measures to contain such outbreaks especially for diseases with a high rate of morbidity or mortality and limited medical treatment and/or prophylaxis.⁽¹⁾

A comprehensive plan with many activities should be followed during an Infectious Disease Emergency Response. This plan includes 1; measures for disease containment such as infection control, mass prophylaxis, isolation and quarantine, restriction, and clearance. 2; Coordination with other cities and organizations. 3; Development and dissemination of information and guidance for the medical community, responders, general public. 4; Coordinating medical care systems and managing alternate care and/or shelter sites is also important. 5; the epidemiological surveillance and investigation activities in addition to collection and analysis of data.⁽¹⁾

The pandemic infection is a major public health crisis worldwide. Dental health care workers(DHCW) are at high risk for infection due to occupational hazards associated with aerosol-generating dental procedures, persons, and inanimate objects contact.⁽²⁾ All these special characteristics of dental settings increase the risk of cross-infection between dental practitioners and patients. Therefore, dentists have a high risk of infection from patients and potentially spreading it to their peers, families, and other patients so, strict and effective infection control protocols are urgently needed^(2,3)

During the crisis, emergency care clinics must follow strict measures recommended by regional health authorities to minimize risks of disease transmission. Dentists use a combination of internet applications and teledentistry for patient evaluation and treatment while minimizing occupational hazards. Tele-dentistry is the delivery of dental care at a distance, using information and communication technologies. All standards of practice and regulatory and professional obligations that apply

to in-person care also apply to teledentistry.⁽⁴⁾

The pandemic infection has also impacted how dentistry is practiced in academic dental institutions.^(5,6) Elective and routine dental procedures may be canceled to prioritize essential urgent care and prevent community transmission of infection and all dental care in the setting of teaching clinics may also be suspended for all dental students.⁽⁷⁾

Concerning dental education during the infectious crisis, there are many recommendations such as online lectures, case studies, and problem-based learning tutorials that should avoid unnecessary aggregation of people and associated risk of infection.^(8,9) Existing smart devices and applications have already made it possible for students to listen to and review lectures whenever and wherever possible. It is worthy to encourage students to self-learning, make full use of online resources, and learn about the latest academic developments. Providing psychological services to support students against infectious crises is also one of the important precautionary measures.⁽⁶⁾

Several strategies and measures were implemented by various dental institutions as teledentistry consultation, maintenance of a small multidisciplinary team of essential clinicians & support staff, financial assistance resources, free online courses, and the use of private operatory rooms instead of open areas.⁽¹⁰⁾

Despite these encouraging measures of support and collaboration, there is a lack of clear and standardized measures to be followed to face any future crisis, so in this study, we shared the implemented precautionary measures at the levels of university staff members, dental clinicians, and dental students to face any future infectious crisis, aiming to provide strict measures to all persons in the dental field either academic, clinicians or even students to minimize the risks of any future infectious crisis.

MATERIALS AND METHODS

This study is a questionnaire-based cross-sectional study. It was conducted on three groups which included: university staff members, dental clinicians, and dental students. The questionnaires were sent to all university staff members at the Faculty of Dentistry and all dental students and many groups of dental clinicians via WhatsApp groups, which included 657 subjects. The individuals who sent back the response were included in our study. A total number of 480 subjects sent back the response and were included in this study (70 university staff members, 60 dental clinicians, and 350 dental students).

A closed-ended self-administered electronic questionnaire was created on Google Form on July 18, 2021, and kept available for the participants till October 18, 2021. Gentle reminders were sent to those who did not respond to the questionnaire the first time. Three forms of questionnaires were prepared, one form for each group. The link for questionnaire related to university staff members was (<https://forms.gle/RKVxXnArbV6ATMww7>), the link for the questionnaire of dental clinicians was (<https://forms.gle/97Q1ANeN82Qe4BTz5>), and which related to dental students was (<https://forms.gle/tdsJqASVGaqNVfx99>)

Each questionnaire included different proposed measures to face any infectious future crisis. These proposed measures were collected from the crisis response practical toolkit published by the National Democratic Institute 2020. ⁽¹¹⁾ In addition to other researches about the impact of covid 19 on Dentistry. ^(5,6,10) Questionnaire on the level of university staff members included 9 items, on the level of dental clinician and dental students included 5 items. The response for each suggested measure was either effective, partially effective, or non-effective. In addition to that, one open-ended question to specify any other precautionary measures suggested by the participants. The

following proposed measures were included in each questionnaire

On the level of university staff members

1. Establishing a crisis management unit at the college.
2. This unit publishes all new information about the crisis daily backed by research and from reliable sources as WHO on a special online channel.
3. Participation of workers and beneficiaries of the college in decision-making in the form of a committee.
4. Presence of an official spokesperson for the college to speak with the media.
5. Rapid response based on correct, uncompromised, or wrong information so as not to lead to more confusion with frankness and clarity.
6. Creating a crisis fund at the college.
7. Creating a free treatment unit inside the college while adhering to quarantine measures.
8. Introducing new means of distance education that are more interactive.
9. Develop a future plan for the practical and theoretical curricula in anticipation of changes.
10. Others,pleasespecify.....

On the level of dental clinician

1. The GDC seeks to establish a crisis management unit with a special fund.
2. Presence of an official spokesperson for the council to point all new information supported by reliable resources.
3. The existence of an official channel for the council that publishes visual information continuously.

- 4. Seeking to develop a specific protocol for dentists to guide them at work (emergency cases, infection control measures, ventilation, etc.).
- 5. Creating a free treatment unit with adhering to quarantine measures.
- 6. Others, please specify.....

On the level of dental students

- 1. Seeking to establish a committee of students for each year to discuss changes in theoretical & practical approaches, as well as to listen to their suggestions
- 2. Establishing a YouTube channel special for the university on which a curriculum is already registered.
- 3. Seeking to develop e-learning and train students from the first year.
- 4. Establish a YouTube channel specific to students to constantly keep them informed of the precautionary instructions and measures.
- 5. Creating a free treatment unit specific to students while adhering to quarantine measures.
- 6. Others, please specify.....

Ethical considerations:

The purposes and benefits of the study were mentioned to all participants at the beginning of the questionnaire. Subjects who agreed to give their consent by answering the questionnaire were included in the study. The collected data was safeguarded with high privacy. This study was conducted after approval of the Ethical Committee of Faculty of Dentistry under this code number (A20030821)

Validity and reliability

The validity of the questionnaire was confirmed by three experts in the field. Those experts described the validity of the questionnaire as optimal and all of its items were fairly good. The Cronbach’s alpha

reliability coefficient was determined to be 0.66 which is reliable.

Statistical analysis

Responses from participants were collected and downloaded in spreadsheets from Google Forms, then subjected to the statistical analysis using the Statistical Package for the Social Sciences (SPSS PC Version 23.0). The Chi-Square test was used as data was presented as frequency and percentage. P<0.05 was set as the level of significance.

RESULTS

The questionnaires were sent to a total of 675 university staff members, dental clinicians, and dental students, of them 480 subjects were responded to the questionnaire with a response rate of 71.1%.

The result reveals that the majority of participants in all categories (82.7% in university dental staff, 77% in dental clinicians, and 79.4% in dental students) agreed on the effectiveness of the included precautionary measures.

The precautionary measures responses showed a highly statistically significant difference (P= 0.000), related to each question as regarding all responses (effective, partially effective, and non-effective), at different levels (university staff members, dental clinicians, and dental students). The greatest response was related to the effective one, followed by the partially effective and lastly non-effective response with a highly statistically significant difference between them (P= 0.000).

On the level of university staff members, the predominant percentage of participants (95.7%) reported that “developing a future plan for the practical and theoretical curricula in anticipation of changes” was the most effective precautionary measure to face any future crisis. While “participation of workers and beneficiaries of the college in decision making in the form of a committee” was the least effective.

TABLE (1): Precautionary measures responses at the levels of university staff members, dental clinicians, and dental students to face any future infectious crisis.

University staff members level					
Precautionary measures	Response	Effective	Partially effective	Non-effective	Test of significance (P-value)
Establishing a crisis management unit		61 (87.1%)	8 (11.4%)	1 (1.4%)	92.257 (0.000)
Publishing new information about the crisis		58 (82.9%)	10 (14.3%)	2 (2.9%)	78.629 (0.000)
Participation in decision making		45 (64.3%)	21 (30%)	4 (5.7%)	36.371 (0.000)
Presence of official spokesperson		52 (74.3%)	16 (22.9%)	2 (2.9%)	57.029 (0.000)
Rapid response		64 (91.4)	6 (8.6%)	-	48.057 (0.000)
Creating crisis fund		53 (75.7%)	13 (18.6%)	4 (5.7%)	58.314 (0.000)
Creating a free treatment unit		59 (84.3%)	6 (8.6%)	5 (7.1%)	81.800(0.000)
Introducing new means of distance education		62 (88.6%)	7 (10%)	1 (1.4%)	96.886 (0.000)
Develop a future plan		67 (95.7%)	3 (4.3%)	-	58.514 (0.000)
Total		521 (82.7%)	90 (14.3%)	19 (3%)	702.867 (0.000)
Dental clinicians' level					
Precautionary measures	Response	Effective	Partially effective	Non-effective	Test of significance (P-value)
Establish a crisis management unit		42 (70%)	15 (25%)	3 (5%)	39.900 (0.000)
Presence of official spokesperson		43 (71.7%)	10 (16.7%)	7 (11.7%)	39.900 (0.000)
Existence of an official channel		39 (65%)	14 (23.3%)	7 (11.7%)	28.300 (0.000)
Develop a special protocol for the dentist		53 (88.3%)	5 (8.3%)	2 (3.3%)	81.900 (0.000)
Creating a free treatment unit		54 (90%)	3 (5%)	3 (5%)	86.700 (0.000)
Total		231 (77%)	47 (15.7%)	22 (7.3%)	260.540 (0.000)
Dental students' level					
Precautionary measures	Response	Effective	Partially effective	Non-effective	Test of significance (P-value)
Establish a committee of student		274 (75.5%)	55 (15.2%)	21 (5.8%)	323.217 (0.000)
Establish a youtube channel for curriculum registration		293 (80.7%)	40 (11%)	17 (4.7%)	402.040 (0.000)
Develop e-learning		215 (59.2%)	66 (18.2%)	69 (19%)	124.360 (0.000)
Establish a youtube channel for precautionary measures		275 (75.8%)	58 (16%)	17 (4.7%)	329.526 (0.000)
Creating a free treatment unit		332 (91.5%)	13 (3.6%)	5 (1.4%)	596.440 (0.000)
Total		1389 (79.4%)	232 (13.2%)	129 (7.4%)	1678.205(0.000)

- Data was prescribed as frequency and percentage.

-Test of significance is the Chi-square test at P- level ≤ 0.05

- The detailed proposed Precautionary measures were mentioned in the materials and methods sections.

On the level of the dental clinicians, creating a free treatment unit with adhering to quarantine measures was the most effective measure. While the existence of an official channel for the council that publishes visual information continuously was the least effective measure.

On the level of dental students, they stated that “creating a free treatment unit specific to students with adhering to quarantine measures” was the most effective measure. While Seeking to develop e-learning and training students from the first year was the least effective precautionary measure.

Other items were specified by different participants. On the level of university staff member: 1; continuous communication with university staff members at all times and not in a time of crisis only, 2; create alternative plans and development of new and innovative remote evaluation methods, 3; making a monthly evaluation in anticipation of stopping the study, 4; teaching students how to deal with any epidemic, 5; creating a strong internet infrastructure, 6; increasing the buildings and amphitheatres to accommodate increasing the student’s density and 7; making mandatory laws and rules to control infection and applying social distancing to all college-goers.

On the level of dental clinicians: 1; continuous general dental council communication, not in a time of crisis only, 2; conducting the necessary smears analyses for members for free, 3; implications of the required decisions and 4; conducting continuous training courses to raise the efficacy.

On the level of dental students: 1; the presence of a clear and announced plan from the first day, 2; the presence of question bank, 3; flexibility in dealing and cooperating with students, 4; guidance panels on how to deal with the crisis, 5; paying attention to students’ opinions and not ignoring them, 6; providing the required and adequate training, 7; using animations in recorded lectures, 8; easy communications with university staff members,

9; creative and new ways of teaching, the 10; the presence of educational and simplified lectures available for all and easy to view, 11; organizing clinics appointments, 12; providing uncommon protective equipment and a special analysis lab, if possible and 13; focus on interactive lectures.

DISCUSSION

Planning for any future crisis, knowing how many challenges, and establishing the appropriate situation for adaptation have become a necessity. Planning became critical to minimize the sudden and disastrous effect of any infectious pandemic disease on society. It was found that during the infectious crisis the decisions will be made with limited prior experience, under rapidly changing and uncertain conditions.⁽¹²⁾ preparedness to face any pandemic disease became necessary and inevitable.⁽¹³⁾

To the best of our knowledge, there are no studies that discussed this research point in dentistry. Most of the previous studies focused on moral decision-making, urgent dental care, special precautions for infection control, and emerging future challenges^(2,5-7). All these studies are lacking a comprehensive plan to face any infectious crisis in the future.

Available evidence suggested that the complete control of any infectious crisis is difficult^(14,15). This fact implies that managing any public health problem relies primarily on planning for developing precautionary measures to face any infectious crisis

The World Health Organization (WHO)⁽¹⁶⁾ recommended a specific action to be taken by national authorities before any pandemic infection. The first phase of this action includes planning and situational monitoring. So, the present study was performed as a starting point for planning to provide leadership and coordination across different sectors to face any infectious crisis.

In the present study, most of the included participants endorse the effectiveness of the taken mea-

asures. On the level of university staff members, the most effective measures were related to developing a future plan, rapid response, introducing new means of distance education, and Establishing a crisis management unit while the least one related to the participation of workers in decision making and presence of an official college spokesperson. This could reflect the total responsibility of governmental institutions in decision-making based on previously established strategic plans. Also, this result highlights the importance to establish a crisis management unit for future planning to face any crisis.

On the level of dental clinicians, the presence of a free treatment unit and guidance protocol represents the most needed measures. Therefore, the work of the general dental syndicate must be amplified by developing its resources and activating its awareness and educational role.

On the level of dental students, a free treatment unit represent the most effective measure while e-learning represents the least effective measure. Therefore, the university must develop modern means through which it is possible to double the infrastructure and provide more places for students to reduce the density in the fields and practical sections. It also seeks to amplify its resources in addition to safely creating more interactive educational means.

Kevin et al (2020) ⁽¹⁰⁾ concluded many encouraging measures of support and collaboration during an infectious crisis. These measures included providing mental health counseling and financial assistance resources to help students and staff during the crisis. In addition to providing courses and seminars to share knowledge and promote professional collaboration.

From all of the above, it is highly important to develop a future plan, provide adequate funds, and a safe environment in interacting with any future crisis. So, this study suggests different precautionary measures which may help the national health

organization to set guidelines to face any infectious crisis. But we still need more studies with a larger sample size and more suggested measures.

CONCLUSION

The results of our study suggested that the most effective measures to face any future infectious crisis in the dental field are developing a future plan, rapid response and, establishing a crisis management unit in addition to the presence of a free treatment unit and guidance protocol.

RECOMMENDATION

The national health organization and health authorities should give special attention to performing a comprehensive plan to face any infectious crisis based on a collection of information and situational analysis.

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