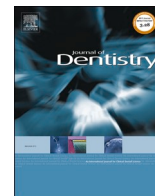




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The perceived impact of Covid-19 on periodontal practice in the United Kingdom: A questionnaire study

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ABSTRACT

Introduction: COVID-19 has impacted dentistry in unprecedented ways.

Objective: The following research aimed to investigate the impact of the COVID-19 pandemic on periodontal practice in the United Kingdom using the COM-B (Capability Opportunity Motivation-Behaviour) model as the basis for a questionnaire.

Basic research design: An online survey link was sent to all members of the British Society of Periodontology and Implant Dentistry. A total of 358 responses were received and analysed.

Results: The great majority of participants thought that the pandemic had an impact on their profession, while only 4.7 % had no concerns. The main worries related to financial concerns and ability to provide appropriate levels of care. More than 80 % of respondents agreed that their establishment was compliant with infection control procedures. Some participants felt benefits mainly in terms of more time for CPD activities. It was felt that some of the changes needed will need to be sustained long-term.

Conclusions: Respondents were generally worried. However, they perceived they had the physical and psychological ability to effect changes to their practice, higher than the physical and social opportunities that they were afforded. Although the COVID-19 pandemic is causing profound changes and worries for the profession of Periodontology, clinicians are clear about their capability to control the situation and feel they have the motivation to make the required changes.

Clinical significance: COVID-19 has presented clinicians with novel challenges. Investigating the professional response to change and expected impact is of interest in the current climate as we navigate the 'new normal'. Assessing the results could be useful in informing support strategies moving forward.

1. Introduction

The COVID-19 pandemic presents a challenging environment in which dentistry has needed to evolve rapidly. Performing procedures safely for both patients and staff in the face of the virus outbreak is uncharted territory.

Respiratory droplet and aerosol transmission have been identified as potential routes of COVID-19 transmission [1–3]. Dental professionals have been identified as being 'very high risk' of exposure, specifically when carrying out aerosol generating procedures (AGPs) on infectious patients [4]. As a result, on 25th March 2020, all non-urgent, routine dental care was suspended until further notice [5]. As specified by NHS guidelines published in April 2020 [6], urgent dental care (UDC) centres were to provide limited emergency treatment. The UK underwent a

sustained human-to-human transmission phase of COVID-19 [7,8], and the NHS suggested considering that all patients may potentially have the virus [6]. Hence, it was recommended to ensure adequate physical separation or spacing appointments for patients attending UDC sites if deemed necessary following remote triage. Additionally, due to the transmission routes of COVID-19 [9], all AGPs were to be avoided unless essential and sites undertaking AGPs were required to use additional personal protective equipment (PPE) for such interventions [10]. At the time of writing, dental practices in the UK have gradually re-opened following directions by the Chief Dental Officers, provided compliance to specific guidelines is observed.

The issues above have had a profound effect on dentistry in the UK, and particularly to Periodontology, since many of the periodontal procedures carried out involve AGPs. Returning to work in a dental practice

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requires behavioural change from health professionals working in the field of Periodontology. The COM-B (Capability Opportunity Motivation-Behaviour) system (supplemental material 1), [11] which has been advocated as a useful way to understand behaviour change in dentistry [12], proposes that behaviour change occurs as a result of the interaction between three components;

- Capability (C) – defined as internal factors that give the individual capacity to engage in a behaviour.
- Opportunity (O) – defined as external factors that make the behaviour possible.
- Motivation (M) – this consists of conscious motivation (explicitly making plans and thoughts to enact a behaviour and automatic motivation which involves habitual or instinctive responses [11]

The COM-B model is a framework aiming to understand how people may make behavioural changes in a variety of settings from minimally invasive practice in dentistry [13], to caries management [14] and smoking cessation service uptake [15]. As such, COM-B provides a theoretical perspective which can aid the understanding of how people may change (or fail to change) their behaviour in response to a perceived need to do so. Whilst COM-B has traditionally been used to structure behaviour change interventions in patients, its use can also provide a basis for understanding the broad factors that may be at play for dental teams when considering returning to practice after a pandemic [16]. These behaviours can range from completing pending admin tasks, online consultations, carrying out continued professional development (CPD) to changes to infection control/PPE protocols, management of a backlog of patients and how to cope with future infectious diseases.

This research was conducted with the aim of understanding the impact of the COVID-19 outbreak on the dental profession; rather than surveying the whole of the dental profession, we chose to focus on those working in Periodontology, as they would be some of the most impacted by the issues and challenges associated with care frequently requiring AGPs. Whilst primarily interested in respondents' views on the impact of COVID-19 on dental practice work, we were also interested to explore whether there were differences between professional groups (periodontists, hygienists, general dental practitioners) given that these different groups were returning to different ways of working as a result of the pandemic.

2. Materials and methods

The study was granted approval by the relevant Research Ethics Committee (reference HR-19/20–19049). An online questionnaire was created through a Qualtrics survey and cascaded to a list of all members of the British Society of Periodontology and Implant Dentistry (BSP) (n = 1317) on 20th May 2020. The survey was open for 4 weeks, until 18th June 2020. During this time, respondents were sent two email reminders. The survey stayed open for 4 weeks only because the context within which dental teams were operating kept changing after this time and we were keen to capture their views at the early stages of returning to practice. To give context, the Department of Health first published interim advice on coronavirus for primary care on 21st January 2020 with the Office of the Chief Dental Officer of England suspending clinical care according to their protocols aiming to reduce COVID-19 transmission on the 25th March 2020. Therefore, practitioners had been operating under the 'new normal' for nearly two months when the survey was circulated. Data collection took place whilst the UK was gradually coming out of the COVID-19 lockdown and overlapped with the returning to work phase, which started gradually from 4th June [17, 18]. During this time, dental practitioners will have had access to guidelines from a range of Governmental and profession bodies, had time to fully understand and reflect on present and upcoming challenges. The questionnaire asked questions about:

- Participants demographics (e.g. age, gender, ethnicity, professional group)
- Previous COVID-19 symptoms/diagnosis
- Perceived effects of COVID-19 on professional practice
- Perceived support from the Government and General Dental Council (GDC)
- Infection control measures (procedures in place in order to reduce the risk of infection within the dental practice)
- A COM-B part consisting of questions on returning to practice [16]

Questions were constructed by a multidisciplinary team of periodontists and psychologists and aimed to assess the various impacts of the pandemic on dental practice. Items were constructed with standard psychometric procedures in mind and most were assessed using a 5-point Likert scales. The COM-B questions were assessed on a 0 (not at all) - 10 (extremely so) scale.

2.1. Data analysis

Data were explored using descriptive statistics. Inferential analyses were carried out using chi-square tests and repeated measures ANOVA where appropriate. The COM-B data were also subject to internal consistency analysis through Cronbach's alpha. The required sample size to detect a small ($d = 0.3$) effect at the 95 % confidence level was $N = 30$ so the survey was sufficiently powered.

3. Results

3.1. Demographics

A total of 358 participants accessed the survey, and 356 of them consented and answered the online questions. The response rate was thus 27 %. Supplemental material 2 shows demographic data of participants. Age was normally distributed with most participants ($N = 145$) being between 35 and 54. Most of the respondents were hygienist/therapists ($N = 94$), followed by periodontists ($N = 87$) and then general dentists ($N = 37$). The sample was predominantly White, followed by Asians, mixed/other and Black African/Caribbean, and predominantly female. Most of the sample were disability-free ($N = 250$). Most people self-reported as not having a condition that would put them at higher risk of COVID-19 infection ($N = 221$). The vast majority were neither experiencing COVID-19-related symptoms ($N = 345$), nor had they had COVID-19-related symptoms in the past ($N = 295$). Of those taking part, over 50 % were employed in private practice ($N = 202$) or in a hospital / university setting ($N = 68$), followed by some ($N = 55$) working only for the NHS. The majority had completely stopped all dental activities ($N = 205$) as a result of the COVID-19 lockdown.

3.2. Perceived effects of COVID-19 on professional practice

Fig. 1 reports data relative to worries about the effects of COVID-19 on the profession. The vast majority ($N = 319$) agreed that they were worried, although 17 (4.7 % of the sample) reported no concerns. Based on a 5-point Likert scale, financial impact ($M = 4.18$, $SD = 1$) was the top concern, where 77 % reported being either 'quite a lot' or 'extremely' worried. The second most worrisome area was the ability to provide appropriate levels of care ($M = 4.08$, $SD = 1.05$) with 76.1 % worrying 'quite a lot' or 'extremely', about this. The least worrisome area was loss of clinical skills where only 27.1 % of participants reported being overly worried about this issue. A number of participants shared with us worries about returning to practice in free text responses. Their responses were content analysed and revolved round *patient factors* (adverse impact of closures on patient perceptions of dentistry, communication issues in delivering dentistry in PPE kit), concerns about the *future of dentistry* (costs, lack of guidance), *practical issues* (spaced appointment times, failure to follow new procedures, travelling to

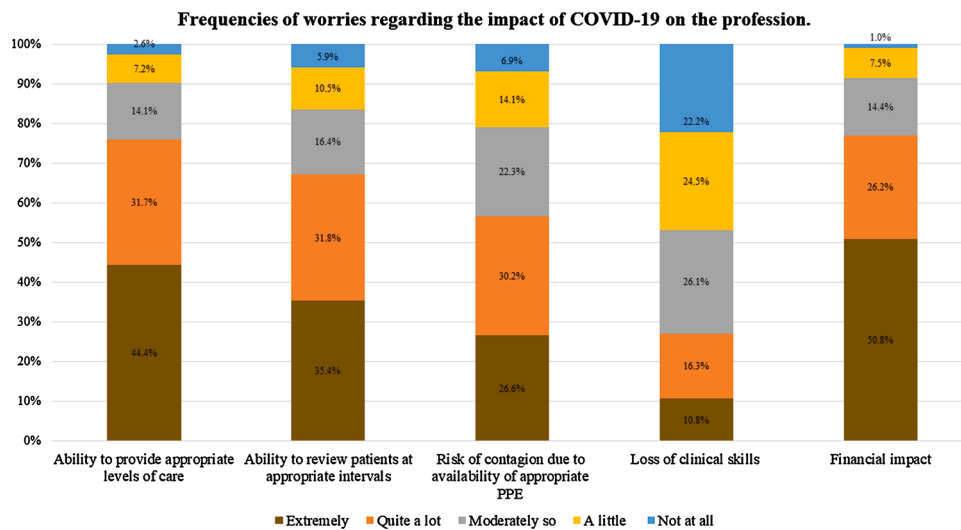


Fig. 1. Participant responses about ‘worries regarding the impact of COVID-19 on the profession’. Percentages among respondents are reported.

work), *career concerns* (need to retrain, job losses, workload changes) and finally, *ill health* (mental health impacts and concerns about getting infected).

3.3. Perceived support from the Government and GDC

The majority of responders (86 %) either moderately or strongly disagreed, while a minority (3.1 %) moderately or strongly agreed, that the Government had sufficiently supported the dental profession during this period. Similarly, 86 % moderately or strongly disagreed, while 9% moderately or strongly agreed that the GDC had supported the profession. The strength of these views was evident in free-response comments which confirmed that respondents felt supported by some bodies such as the British Dental Association (BDA) and British Society of Dental Hygiene and Therapy (BSDHT) but rather unsupported by the Government, GDC and Care Quality Commission (CQC).

3.4. Perceived impacts on periodontal practice and procedures

periodontology will be practised in the future. Ninety percent of participants agreed there would be impacts. In terms of practice, reduced volume of patients per day (76.4 %), followed by use of hand scalers/ currettes instead of ultrasonic/ piezoelectric devices (69.1 %) were the top predicted changes. In terms of impacts on procedures, participants saw great/ extreme impacts for non-surgical therapy (74.4 %), periodontal supportive therapy (64 %) followed by access flap surgery (61.4 %) and periodontal / plastic surgery (52.3 %) (Fig. 2 B).

3.5. Engagement with CPD and colleagues during lockdown and other benefits in the situation

The lockdown did not appear to have any substantial impacts on participants’ interactions with colleagues, with 32.1 % reporting engaging as much as usual and 28 % reporting engaging more than usual with colleagues. A small number of participants (10.7 %) reported engaging with CPD less than usual or not at all, with the vast majority of participants (68.6 %) reporting that lockdown served as a time to engage with CPD activities more than usual. More time to do admin work, followed by the chance to engage in CPD or with activities to improve

Fig. 2 A reports data relative to COVID-19 impacts on how

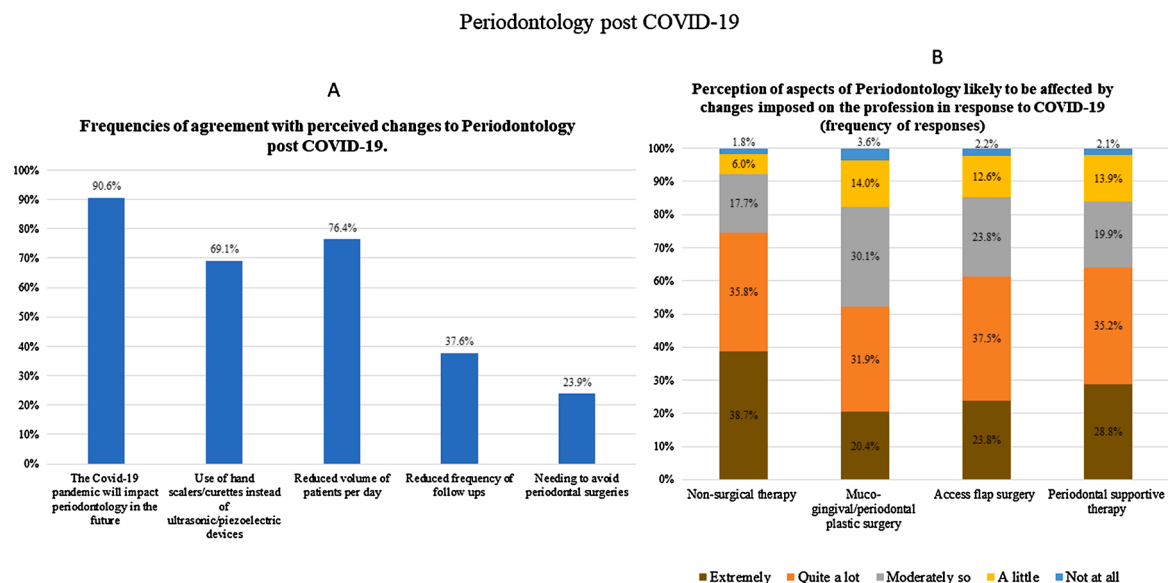


Fig. 2. Participant responses about ‘Perception of changes to the profession post-COVID-19’ (2A) and about ‘Perception of aspects of Periodontology’ likely to be affected by changes imposed to the profession in response to COVID-19’ (2B). Percentages among respondents are reported.

mental health and alleviate stress were the most popular options as opportunities for benefit-finding during the lockdown. Less so was the opportunity to reflect on previous cases (26.4 % of participants reported strong agreement with this statement). In terms of positive impacts in the practice of dentistry (see supplemental material 3), data were normally distributed in terms of feelings that the pandemic would lead to better spaced appointment times. There was a strong support for the idea that more emphasis will be placed on oral hygiene and to a lesser extent surgery disinfection procedures. This was the only area where the participant’s profession (divided as the main groups periodontist vs. hygienist vs. GDP) was associated with responses. Statistically significant associations ($p < .001$) between professional group and strength of agreement were noted in the answers about better spaced appointments, more emphasis on OH and on surgery disinfection procedures where hygienists tended to be more likely to agree with these statements than others.

3.6. COM-B

A Cronbach’s alpha test was carried out on the COM-B scale that showed that the scale was internally consistent ($\alpha = .771$). The data were analysed using repeated measures ANOVA that revealed statistically significant differences between the different components of the COM-B model. The highest score ($M = 7.41, SD = 2.51$) was seen for conscious, effortful motivation (Table 1). The lowest score related to automatic, habitual, instinctive motivation ($M = 4.49, SD = 2.96$). Levels of physical and social opportunity were not perceived to be particularly high, whereas physical and psychological ability were higher. The differences between Capability, Opportunity and Motivation items were statistically significant ($F_{(5,1335)} = 69.70, p < .001$).

3.7. Online consultations

A small proportion of participants ($n = 46, 13\%$ of original sample) reported having experience with online consultations with patients. Fig. 3 reports views about online consultations. The first 5 questions asked about effectiveness/usefulness of online consultations. The aspect which was considered most useful was ‘usefulness to triage patients’ (82.3 % of 254 respondents), while the aspect with the smallest agreement was ‘effectiveness to manage routine conditions (40.5 % agreement). Questions 6–8 asked if any specific aspects may make online consultations less effective. More participants (58.4 %) agreed that online consultations may not appeal to the general public, while fewer (48.6 %) agreed that they would not be effective as patients would fail to recognise disease. A slight majority of participants (58.6 %) agreed that online consultations may be useful post–COVID-19. A similar percentage of participants felt (somewhat/strongly agreed) they had confidence and competence to carry out online consultations (129 and 138 out of 255 respectively).

3.8. Infection control

The set of questions relative to infection control revealed that the majority of participants (85.8 % of 253 respondents) strongly agreed that their establishment was compliant with infection control

Table 1
Responses relative to COM-B.

		Mean	S.D.	Number of responders
Opportunity	Physical opportunity	5.43	3.07	268
	Social opportunity	5.58	2.77	268
Motivation	Conscious motivation	7.41	2.51	268
	Automatic motivation	4.49	2.96	268
Capability	Physical capability	6.68	2.45	268
	Psychological capability	6.95	2.35	268

procedures. Interestingly, 4 somewhat disagreed and 4 strongly disagreed. A vast majority of participants (82.7 %) agreed that they would put a stronger emphasis on infection control now. The measures suggested for infection control in the questionnaire were: i) screening and categorising patients, ii) use of preoperative antiseptic mouthwashes, iii) revised PPE protocols, iv) revised sterilisation protocols, v) revised decontamination protocols and vi) avoiding the use of aerosols. The great majority of participants found that the suggested measures (particularly screening and categorising patients, revised PPE protocols and revising decontamination protocols) could be effective, while preoperative antiseptic mouthwashes were not thought to be effective by the majority of the participants (28.9 % agreed). Nearly half of the participants (47.8 %) agreed that avoiding aerosols would reduce risk of cross-contamination. Antibody testing, immunisation and air purifiers were suggested as potential additional infection control measures. Some participants were very vocal in stating that it would be very difficult to work with no aerosol-production in the context of modern dentistry.

4. Discussion

This study clearly shows that health professionals working in the field of Periodontics in the UK (members of the British Society of Periodontology and Implant Dentistry) are worried about the effect of the COVID-19 pandemic on their profession. The main worries were related to financial issues and inability to provide appropriate levels of care. The impact of financial worries was also reported in a recent survey undertaken by Dental Protection. They found 53 % of dental professionals reported financial worries as having the biggest impact on their mental wellbeing [19].

More than 80 % of respondents felt the support from Government and GDC had not been adequate, with many reporting a lack of leadership, lack of financial support and unclear, unhelpful and untimely advice.

Participants felt that the areas most affected would be reduced volume of patients per day, followed by use of hand scalers/curettes instead of ultrasonic/ piezoelectric devices. Non-surgical periodontal therapy was thought to be the most affected procedure, probably because of the common use of ultrasonic/piezoelectric devices generating aerosols. Participants felt that in future more emphasis would be placed on oral hygiene instructions and on disinfection procedures within the surgery (this was felt especially by hygienists).

The majority of participants strongly agreed that their establishment was compliant with infection control procedures. The great majority of participants found that the suggested measures (particularly screening and categorising patients, revised PPE protocols and revising decontamination protocols) could be effective, and while recognising that avoiding aerosols would reduce risk of cross-contamination, many participants were concerned about working without aerosol-generating procedures (AGPs). Some felt that modern dentistry is inextricably associated with AGPs and it would be very difficult to adapt work in a different way. Worryingly, a small percentage of participants strongly disagreed that their establishment was compliant with infection control procedures. This group of respondents did not appear different from the rest of the sample in terms of profession, age or ethnicity.

Tele-medicine has been introduced in recent years as an alternative to face-to face consultations and it refers to a developing practice of caring for patients online, when the provider and patient are not in each other’s physical presence [20,21]. Participants felt that online consultations could be useful in Periodontology, especially to triage patients, and their role could extend beyond the current lockdown. However, there was some concern that they may not appeal to the general public and that patients would fail to recognise, quantify and describe disease to a degree that would allow anything beyond the most basic treatment advice. The evidence about tele-dentistry is still quite limited [22,23] and research on the potential benefits of online consultations in dentistry is needed.

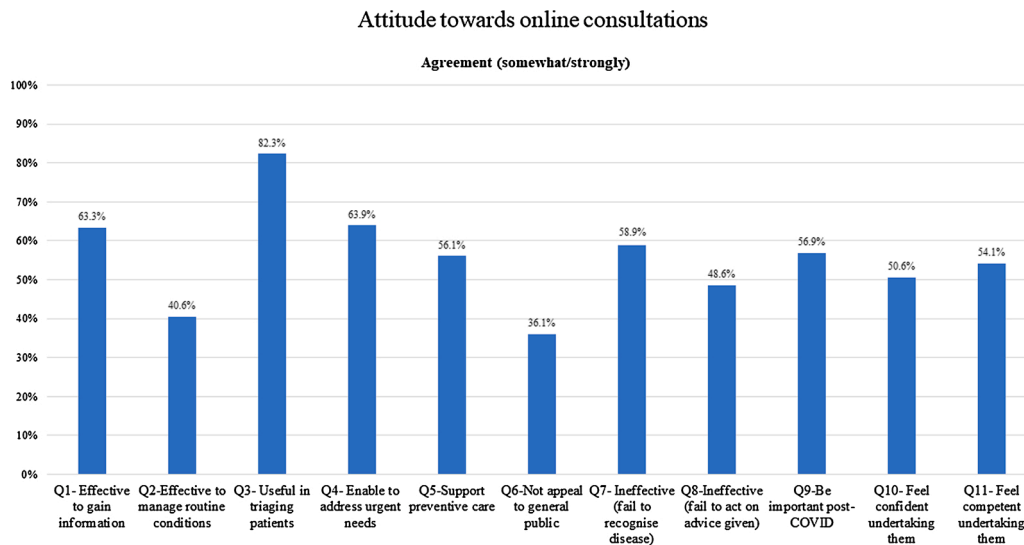


Fig. 3. Participant responses about 'Attitude towards online consultations'. Percentages among respondents are reported.

COM-B assessment showed that participants seem to have good explicit motivation to make the necessary changes to their practice and were aware that the changes will require conscious effort. Interestingly, whilst they perceived they had the physical (e.g. stamina, skills) and psychological (e.g. knowledge and psychological skills) ability to effect changes to their practice, these scores were higher than the physical and social opportunities that the participants perceived they were afforded. The findings of this study using the COM-B model show how behavioural science theory has the potential to inform our understanding of and support clinical practice through interventions that systematically target aspects of behaviour that have been impacted by COVID-19.

Limitations of this study are inherent to the participants included, who were not randomly selected and represent only about a third of members of the BSP. Furthermore, this questionnaire aimed to assess only issues related to Periodontology, which is certainly one of the most affected areas of dentistry. A limitation is that a very small proportion of respondents may not be based in the UK, as the BSP has some overseas members. However, overseas members make up a very small element of BSP membership, such that even if all of the overseas members had replied, they would only constitute a maximum of 6% of the respondent sample analysed. Overall, this study confirms that the COVID-19 pandemic has caused considerable worry to practitioners in Periodontology in the UK. However, most dentists and hygienists taking part in this survey feel they have physical and psychological ability to make the necessary changes to adapt to the new developments due to the pandemic, even if not all feel that opportunities for changes are available, which sends a clear message about the strength and resolve of the profession. Changes in infection control, instruments used and possibly the introduction of online consultations are being considered during this period, and some of these measures may well be extended in the longer term.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.jdent.2020.103481>.

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