Unmasking the impact of face masks on communication between healthcare professionals and patients during the Covid-19 pandemic

Précis

The increase in personal protective equipment (PPE) requirements has both physical and psychological impacts on patients and healthcare professionals. Healthcare professionals should use virtual and visual aids to overcome barriers to effective communication.

Abstract

Introduction: The foundations of patient interactions are heavily dependent on facial expression, tone and inflection, which help to communicate treatment plans, obtain consent and break bad news. The expansion in use of face masks during the Covid-19 pandemic may adversely affect the quality of patient-clinician interaction and service provision.

Objectives: To assess the impact of face masks on the experience of dental staff and patients at Guy's and St Thomas' NHS Foundation Trust.

Methods: A survey was developed using a combination of validated psychometric and demographic questions. The survey was administered to 166 dental staff and 57 patients. Data were electronically analysed. Qualitative data were thematically analysed.

Results: Themes identified included: clinical; physical effects; psychological; pre-existing communication difficulties; communication barriers; and, accessibility of dental services. Some 63% (36/57) of patients noted that personal protective equipment (PPE) affected their communication and interaction. Over 70% (119/164) of dental staff reported repetition during consultations.

Conclusion: This study highlights the positive and adverse physical and psychological impacts of face masks on healthcare professionals and patients. Alternative solutions to mitigate the negative impact of face masks on communication include the use of virtual and visual aids. Furthermore, the implementation of well-being and support resources can aid in the challenges presented to healthcare teams.

Key words: SARS-CoV-2, Covid-19, coronavirus, communication, face coverings, facial expressions, face masks.

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Introduction

Healthcare professionals are no strangers to safety measures. For over three decades, The Personal Protective Equipment at Work Regulations 1992 legislation has been the foundation of health and safety in the workplace.[1] Infection prevention and control measures are well established in the healthcare setting. The global Covid-19 pandemic led to a paradigm shift in the provision of and requirements for personal protective equipment (PPE) across healthcare, resulting in a global surge in demand.

A systematic review by the UK Scientific Advisory Group for Emergencies (SAGE) identified that face coverings significantly aided in the reduction, but

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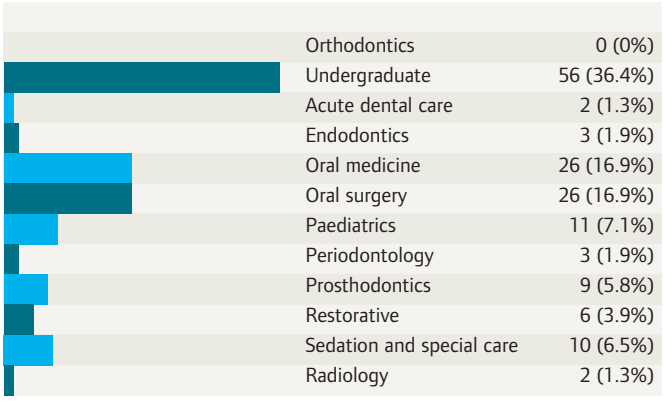
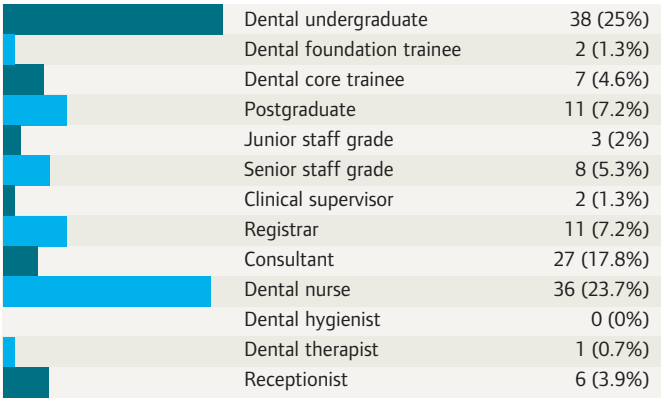


Orthodontics	0 (0%)
Undergraduate	56 (36.4%)
Acute dental care	2 (1.3%)
Endodontics	3 (1.9%)
Oral medicine	26 (16.9%)
Oral surgery	26 (16.9%)
Paediatrics	11 (7.1%)
Periodontology	3 (1.9%)
Prosthodontics	9 (5.8%)
Restorative	6 (3.9%)
Sedation and special care	10 (6.5%)
Radiology	2 (1.3%)

FIGURE 1: Departmental response breakdown.



Dental undergraduate	38 (25%)
Dental foundation trainee	2 (1.3%)
Dental core trainee	7 (4.6%)
Postgraduate	11 (7.2%)
Junior staff grade	3 (2%)
Senior staff grade	8 (5.3%)
Clinical supervisor	2 (1.3%)
Registrar	11 (7.2%)
Consultant	27 (17.8%)
Dental nurse	36 (23.7%)
Dental hygienist	0 (0%)
Dental therapist	1 (0.7%)
Receptionist	6 (3.9%)

FIGURE 2: Staff grade response rates.

not the elimination, of the onward transmission of Covid-19 by pre-symptomatic and asymptomatic wearers.[2] Infection prevention and control guidelines and standard operating procedures evolved, in line with emerging data and anecdotal evidence. For aerosol-generating procedures (AGPs) in the UK, FFP3 masks were recommended.[3] This was met with an increase in the use of fluid-resistant surgical masks in all other instances, including consultations.

Within the United Kingdom, 12 million people are affected by some form of hearing impairment and up to 14 million individuals will experience communication difficulties at some point in their lives.[4,5] As healthcare professionals, we encounter patients who have hearing impairments or patients who are non-English speaking, who may rely on lipreading and non-verbal communication to assist them during consultations, and also paediatric patients.[6-8] The foundations of our interactions with patients are heavily dependent on facial expression, tone and inflection, which help us to communicate treatment plans, obtain valid consent and break bad news.

Here, we evaluate the impact of face masks on communication and the experience of dental staff and patients at a secondary care hospital.

Methods

This service evaluation was registered with the Guy's and St Thomas' NHS Foundation Trust (GSTT) Clinical Audit Registry (audit number 11948). There was no requirement for research ethics committee review.

Survey development and design

The survey questions were generated by identifying themes utilising emerging academic literature on the experiences of healthcare professionals during the pandemic. The questions were reviewed and validated by the GSTT Patient Experience Team (PEX). The PEX is a corporate function that supports and advises teams on a wide range of patient experience activities. Questions included were from the GSTT survey question bank, which contains questions from national surveys (Picker) that have been conducted on behalf of the hospital. All questions have been previously validated. PEX evaluated new questions generated for this survey. The completed surveys comprised 16 questions for staff and 20 questions for patients. The questionnaire was formulated to take no longer than 15-20 minutes to complete.

A combination of open and closed questions was included. Multiple-choice questions using a modified Likert scale were used. Free text questions were included.

The survey was piloted in a small group of individuals from a variety of professional groups and demographic backgrounds to ensure a representative analysis. Changes to the wording and structure were incorporated based on this feedback exercise.

Survey distribution

We obtained information through the distribution of both paper and electronic surveys among all qualified dental care professionals (dentists, dental nurses, therapists, hygienists, technicians, radiographers), administrative team and patient-facing dental undergraduate students across 12 outpatient dental areas including: acute dental care; oral medicine; oral surgery; dental radiology; restorative dentistry; orthodontics; paediatric dentistry; prosthodontics; periodontology; endodontics; special care dentistry; and, undergraduate clinics. Paper surveys were provided to patients in outpatient clinics (oral surgery, oral medicine, acute dental care, dental radiology, and dental undergraduates) running during the data collection weeks.

Data were collected over a four-week period (January 11 to February 5, 2021 – the third national lockdown in England).

Data analysis

Quantitative data were analysed using Civica Experience cloud-based software solution, which enables access to results, and collation and analysis of data. A thematic analysis was performed on qualitative data and triangulated with three clinicians (PA, BC and MO).

Results

Quantitative and qualitative data: dental care professionals

A total of 166 dental staff undertook the survey. The overall response rate was 166/568 (29.2%). Respondents were from across 12 outpatient dental departments. Response rate for each question was variable.

Female to male response was 3:1. The majority of respondents (67/165 [40.6%]) fell within the 25-34 age range. Greatest responses were seen in undergraduate clinics (56/154 [36.4%]), oral medicine (26/154 [16.9%]), and oral surgery (26/154 [16.9%]) (**Figure 1**). Undergraduate dental students made up the largest portion of respondents (38/152 [25.0%]), followed by dental nurses (36/152 [23.9%]), and consultants (27/152 [17.8%]) (**Figure 2**).

Table 1: Themes from staff responses.

Themes	Comments
Clinical	*"….no objection to wearing masks as it's a prevention""I am grateful to have the appropriate PPE""Myriad of non-verbal facial communication signs are lost, which renders the reassuring smile null and void.""Breaks the human aspect as you can't read facial expressions""Quite daunting for patients … we lose the personal touch""Barrier to communication when breaking bad news""Affects overall rapport between dentist and patient"*
Physical effects	*"I cannot wear my glasses with the FFP3""Difficulty using loupes with a reusable FFP3 and difficulty using microscope with an FFP3""….hurt the back of my ears""….aching and pain in my masseters/TMJ""Face is full of acne… I don't feel comfortable with my appearance"*
Psychological	*"Find it uncomfortable … worried it is becoming a normality""Makes me sad it has become my identity""Feel embarrassed to ask people to repeat"*
Pre-existing communication difficulties	*"Difficulty with hard-of-hearing patients and children""… have to speak very loudly, abnormally loudly"*
Communication barriers	*"Communication flow is disturbed, tone of voice is affected, which has an impact on showing compassion""…biggest problem is not being able to hear or lipread my nurse during AGPs … repeating ourselves, shouting and getting frustrated""…resorted to writing, prolonged consultation time"*

The impact of face masks was varied. A number of qualitative themes were identified: clinical; physical effects; pre-existing communication difficulties; and, communication barriers (**Table 1**).

Wearing of both types of masks for long periods of time was associated with the development or worsening of temporomandibular joint (TMJ) dysfunction, sore ears, skin itching, sore throats and acne, with the latter resulting in some participants feeling self-conscious about their appearance. Some respondents experienced negative psychological effects from wearing masks for prolonged periods, such as claustrophobia and worry about a 'new normal'. FFP3 masks were worn for one to three hours per day. While wearing FFP3 masks, approximately 56% (50/89) did not find it easy to breathe and 53% (47/88) felt claustrophobic. Aching of the face, ears and TMJ was experienced by 66% (57/86) of respondents wearing FFP3 masks. The largest concern to emerge was the disruption to communication with patients and fellow staff. It was difficult to establish rapport due to the shielding of facial expressions, repetition required, and lack of clarity in speech. Quantitatively, 85% (75/88) often had to repeat themselves while wearing FFP3 masks and 67.4% (60/89) of respondents found it difficult to hear.

All 166 respondents stated that they wore fluid-resistant standard surgical masks for an average of seven to nine hours daily. In contrast with FFP3 masks, 60/163 (36.8%) reported difficulty with breathing while wearing fluid-resistant surgical masks. Over half (57%) experienced soreness and pain from wearing masks. Some 73% (119/164) had to repeat themselves.

While wearing the fluid-resistant surgical masks, 75% (123/164) of respondents had taken verbal or written consent and 38% (60/158) broke bad news.

For some respondents, wearing face masks provided a sense of safety and were a necessary preventive measure to stop the spread of Covid-19, and they were grateful for this. For others, masks adversely affected pre-existing communication difficulties such as in persons with speech difficulties, hearing impairments, autism, and in children. Difficulty in conversing with patients whose first language was not English was documented. Many respondents found that face masks posed challenges due to interference with wearing glasses and loupes.

Table 2: Themes from patient responses.

Themes	Comments
Gratitude and accessibility	*"Thank you for comforting me…""Very good to access considering the pandemic"*
Clinical service	*"Always thorough, professional and friendly service and everything explained clearly"*
Visual and audio obstruction	*"Difficult to lipread with the masks … have to ask to repeat""Difficulty to see who is treating you as they are hidden"*
Unconcerned	*"No difficulty"*
Adjustments	*"I no longer wear my hearing aids when I have the mask"*

Quantitative and qualitative data: patients

A total of 57 patients completed the survey out of the 100 questionnaires provided, achieving a response rate of 57%. The majority of respondents were female (33/57 [57.9%]), and most were in the 55-64 age range (13/57 [22.8%]).

Some 74% (42/57) of patients who participated spoke English as their first language, with 7% (4/57) documenting a hearing impairment. Some 46% (26/57) of patients were attending for emergency dental treatment, followed by 39% (22/57) who attended assessment-only appointments. The majority of patient appointments (35/57 [61%]) were conducted in an open-layout bay.

While attending their appointment, approximately 23% (13/56) of participants received written consent, 27% (15/56) received verbal consent and 16% (9/56) received both. A large proportion of patients did not receive written information leaflets about their condition/treatment (37/52 [71.2%]), nor were they provided with pen and paper to communicate (47/54 [87%]), nor use of animations and images (45/56 [80%]). Over 63% (36/57) reported that PPE worn by staff affected their communication with them.

The qualitative responses from patients covered both provision of clinical service and the impact of face masks. Themes included: gratitude and accessibility; clinical service; video and audio obstruction; adjustments; and, unconcerned (**Table 2**). Many patients noted that it was difficult to hear staff and read their facial expressions, and made adjustments such as not wearing hearing aids.

Discussion

Effective communication between healthcare professionals and patients is bidirectional, and is pivotal in providing safe, quality care. Communication underpins our exchange of clinical details, building rapport, and in the consent and decision-making processes.

In this study, both staff and patients highlighted how the presence of face masks resulted in them having to repeat phrases frequently and increase speech volume during consultations. Goldin *et al.* highlighted that medical masks and respirators diminished the higher frequency of a speaker's voice (2,000-7,000Hz) with a decibel reduction.[9] For respirators, this reduction was a significant 12dB, and for medical masks between 3 and 4dB, compared to

when no mask was worn. This, coupled with an open-bay layout typical of most dental hospitals, the use of dental drills that generate 90-100dB, and reverberation of sounds from smooth easy-to-clean surfaces, can amplify pressures already experienced in a noisy environment.[10] In patients who experience hearing impairments or communication deficiencies, this complexity of auditory stimuli may lead to miscommunication.[11] The reluctance of individuals to request repeated clarification can also add to this. Patients who are unable to hear or interpret information from a clinician exhibit a greater inclination to hazard 'a guess' on what is being discussed.[12] Anomalies in information obtained can result in discrepancies in clinical information and lead to compromised patient care. Additionally, to compensate for the acoustic attenuation and increased background noise, many may inadvertently violate the privacy and dignity of the patient, particularly when the discussion includes obtaining a medical history, undertaking investigations, or providing a diagnosis and prognosis.[11] Positive patient-clinician relationships underpin patients' health behaviours, with disruption unfavourably influencing adherence and clinical outcomes, and the ability to obtain valid consent.[13]

The implementation of face masks conceals visual clues, such as lipreading and facial expressions, that patients rely heavily upon to determine the presence of empathy and the legitimacy of interactions.[14] Non-English-speaking individuals often rely on non-verbal communication and facial expressions to gather data and understanding.

A theme raised by participants was the issue of breaking bad news. Breaking bad news requires empathy and establishing a patient's perception, facial expression being crucial for this.[15] Most standard face masks conceal approximately 60-70% of an individual's face, leading to misperception of emotional state, as many diverse and opposing emotions such as happiness, sadness, anger and disgust can all be perceived as neutral.[16] In real life, the level of attention and inspection of individual's faces may be even less, and further shielded with full-face visors.

Wearing masks for prolonged periods resulted in participants reporting that they felt the face mask had formed part of their identity and something was amiss by not wearing one. Many commented that wearing surgical masks led to acne, rashes and breakouts (PPE-induced dermatoses) and resulted in them not feeling comfortable with their appearance. With FFP3 masks, more pronounced changes in appearance as a result of skin breaching were documented. A high prevalence (97%) of skin damage in frontline healthcare professionals has been reported, including mask-induced pressure sores on the nasal bridge from respirators.[17] The psychosocial impact of scarring, contact dermatitis and acne on the face is well documented, resulting in a significant impact on quality of life.[18]

This study highlighted that wearing face masks more frequently has led to difficulty in hearing, with some respondents feeling embarrassed. This may diminish as the use of face masks continues; however, it is an area that requires further exploration due to the negative psychosocial impact on mask wearers. Within our hospital, well-being and support services have been increased and are available for the dental team to utilise, including well-being areas with advisors, occupational health services, and self-care resources.

There were mixed emotions from healthcare professionals regarding wearing face masks for prolonged periods while undertaking treatments and during consultations. Some noted that the experience was "difficult", "challenging", "frustrating" and negatively impacted on the provision of services to patients. Extended use of PPE may cause discomfort from additional weight, heat stress, dehydration, and the increased need for respiration. This, coupled with restrictions in movement and an increase in dimensions, can increase stress and anxiety. This can cause a shift in tolerance, lowering it for pain and discomfort and leading to more negative associations with its use.[19] Others acknowledged how grateful and happy they were to have adequate PPE due to the safety it provided.

Many patients provided positive feedback about the accessibility of services and the care they received. With limited access to any dental services due to public health-ordered closures of many primary care practices, patients may have exhibited a positivity bias in their responses to their experiences with enhanced PPE.[20]

There are many resources at our disposal, including the use of virtual and visual aids such as leaflets, diagrams, video animations, mobile phone apps such as Live Transcribe, non-medical-grade clear face masks/face shields, carers and translation services to improve communication when higher levels of PPE are required.[21] These will permit healthcare professionals to continue adherence to the core principle of effective communication with patients.

There were a number of limitations to our evaluation. The survey was distributed during the third national lockdown when only a skeleton service of dental care was provided due to redeployment of dental staff to vaccination centres, ICU and medical wards. As a result, staff and patient participation was reduced. Questions were not mandatory, which led to a varied response rate. The evaluation of a single secondary referral hospital may not be illustrative of the situation nationally and internationally. Moreover, our hospital guidelines and facilities have adapted with the introduction of micro-motors and reformed ventilation, resulting in changes to certain PPE requirements.

Conclusion

This study provides a valuable and novel insight into the effects of enhanced PPE on the experience of the dental team and patients. Undoubtedly, PPE serves to protect our patients and ourselves; however, the expansion has highlighted the physical and psychological impact on both groups.

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CPD questions

To claim CPD points, go to the MEMBERS' SECTION of www.dentist.ie and answer the following questions:

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CPD

1. Surgical masks reduce a person's voice by how many decibels?

- ○ A: 3-4dB
- ○ B: 7-8dB
- ○ C: 12-13dB
- ○ D: 15-20dB

2. Which of the following is a type of consent?

- ○ A: Informed consent
- ○ B: Implied consent
- ○ C: Expressed consent
- ○ D: All of the above

3. Which of the following is not considered an aerosol-generating procedure?

- ○ A: CPR
- ○ B: Ultrasonic scaling
- ○ C: Dental fast-handpiece drilling
- ○ D: Intra-oral radiographs