RESEARCH REPORT

Masking care: A qualitative investigation of the impact of face masks on the experience of stroke rehabilitation from the perspective of staff and service users with communication difficulties

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Abstract

Background: Face mask use has become widespread as a means of reducing transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Research suggests face coverings can impact speech discrimination, therapeutic alliance and the interpretation of non-verbal cues. However, there is little research into the impact of face masks on people with communication difficulties (pwCD) post-stroke.

Aims: To explore the perspectives of service users and staff on a stroke rehabilitation unit in order to understand the impact of staff wearing face masks on the experience of rehabilitation for pwCD. Strategies that might improve the experience of rehabilitation for pwCD were also explored.

Methods & Procedures: Semi-structured interviews and a focus group were conducted with six pwCD and five health professionals (HPs) on a stroke rehabilitation unit. The data were analysed using reflexive thematic analysis.

Outcomes & Results: Four main interacting themes were identified from the data: (1) face masks as a barrier to effective communication; (2) face masks as a barrier to human connection and therapeutic relationships; (3) the impact of face masks on an individual is influenced by multiple internal and external factors; and (4) there is a need for service provision to evolve to meet pwCD’s needs when using face masks.

Conclusions & Implications: Findings shed light on how face masks can act as a barrier for pwCD within the rehabilitative process, and emphasize that each individual with communication difficulties is likely to be affected to a differing extent, as a result of multiple interacting factors. HPs are encouraged to consider the individual holistically, tailor strategies and adapt to each individual’s needs. Further research is required to understand how to optimize rehabilitation outcomes when face masks are used.

KEYWORDS
aphasia, communication difficulties, dysarthria, face masks, rehabilitation, stroke
WHAT THIS PAPER ADDS

What is already known on the subject

There is evidence face masks can affect speech discrimination, therapeutic alliance and interpretation of non-verbal cues. The existing literature predominately considers people with hearing impairments, mental health needs or the general public. The potential for face masks to impact pwCD post-stroke is high, given pre-existing communication barriers and evidence of increased social isolation.

What this paper adds to existing knowledge

This study is the first of its kind to explore how face mask use by HPs impacts the experience of rehabilitation for pwCD post-stroke. The authors consider the need to tailor compensatory strategies to each individual and adapt them to meet service users’ needs.

What are the potential or actual clinical implications of this work?

HPs should monitor closely the impact of face mask use on pwCD with whom they are working, and consider what adaptations to delivery are required. It would be helpful for clinicians to have a discussion with pwCD post-stroke to understand the impact of face mask use on them personally and what strategies they would find most helpful within rehabilitation. Additional training by speech and language therapists on supporting effective communication and successful interaction with pwCD may be indicated in the context of face mask use.

INTRODUCTION

The need for face masks

Face coverings have been globally implemented as a public health strategy to reduce risk of transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) during the current global pandemic. English government guidance since June 2020 is for all staff to wear face masks in hospital settings. Whilst face mask use fulfils the primary objective of reducing the risk of droplet and airborne transmission of SARS-CoV-2 (Chu et al., 2020), there are significant impacts of personal protective equipment (PPE) on communication and care which must be taken into account.

The impact of face masks on speech, communication and therapeutic alliance

Face masks attenuate frequencies above 1 kHz (Corey, Jones & Singer, 2020), therefore affecting higher frequency consonants which are crucial for understanding speech. Masks hinder speech discrimination in a clinical setting even amongst participants with no hearing or cognitive impairments (Hampton et al., 2020), and can impact listening performance, confidence and perceived effort of listening (Giovanelli et al., 2021). In combination with Truong et al.’s (2021) finding that face masks can impact the recall of spoken sentences and participants’ meta-cognitive judgements, we can infer that there are increased processing demands when face masks are used, which may leave fewer resources for communicative success.

Communication includes far more than just the acoustic speech signal. Randomized controlled trials have indicated that masks worn by medical staff can negatively impact their perceived empathy (Kratzke et al., 2021; Wong et al., 2013), perhaps linked to a reduced ability to read emotions when masks are used (Carbon, 2020). Furthermore, the use of face masks has been shown to impact understanding, engagement and feelings of connection (Saunders, Jackson & Visram, 2020), as well as provision of understandable explanations and building of trust in clinical environments (Kratzke et al., 2021). Experts have raised concerns about the impact of face masks on building therapeutic alliance, and made suggestions for how to maximize personalized, empathic communication with the constraints of PPE in place (Marler & Ditton, 2021; Mehta, Venkatasubramanian & Chandra, 2020; Veluri, 2020).
Relevance for people with communication difficulties (pwCD) post-stroke

Research has long supported the creation of communicatively accessible healthcare environments for people with aphasia (Kagan & LeBlanc, 2002) and cognitive communication difficulties. This population, however, is likely to be presented with a particular barrier when confronted with face masks. A distorted speech signal can interfere with language processing (Peelle, 2018) and evidence suggests that the absence of visual lipreading cues can increase processing time for people with aphasia (Dupuis, 2011). This population is also likely to be much more reliant on non-verbal communication to understand information, build therapeutic relationships and maximize health-related outcomes. Altered perceptions of empathy caused by face masks may be particularly pertinent for those with severe aphasia, who have been shown to value empathy as a means of developing a positive therapeutic alliance (Lawton et al., 2020). There is a danger, therefore, that pwCD post-stroke are disproportionately impacted by the use of face masks, potentially exacerbating feelings of social isolation and reducing quality of life: factors already impacted by having aphasia (Cruice et al., 2003; Cruice, Worrall & Hickson, 2006).

The impact of face masks on rehabilitation is particularly relevant within speech and language therapy, where communication and interaction are the primary focus of intervention. The therapy approach of training communication partners to reveal the ‘communicative competence’ (Kagan, 1995) of people with aphasia might be impacted by the barrier that face masks present to non-verbal cues. Modelling and repetition are frequently used methods for supporting people with apraxia of speech. For this population, the distortion of the speech signal and covering of visual facial cues creates a particular disruption of the sensory information believed to support the ability to target particular sounds and relearn motor movements required for speech.

The gap in the literature

Existing research on the impact of face masks on communication and interaction is principally focused on a general ‘healthy’ population, those with hearing loss or mental health needs. Experts have raised concerns about the impact of face masks on older and cognitively impaired patients (Brotto et al., 2021; Gil & Arroyo-Anlló, 2021; Schlägl & Jones, 2020) and within specific clinical environments (Freeman-Sanderson, Rose & Brodsky, 2020; McCarthy, O’Donovan & Trace, 2020). A scoping review of literature by Marler and Ditton (2021) identifies a range of issues related to mask wearing which can be applied in particular to pwCD, and Knollman-Porter and Burshnic (2020) have acknowledged the additional communication barrier that masks present, suggesting compensatory strategies such as speech modification strategies, gesture, and written and picture supports. Neither of these reviews investigates the impact of pwCD related to stroke or evaluates the impact of rehabilitation within this client group.

Experts have suggested strategies to support communication when in PPE, such as a consideration of the communicative environment, interaction style and vocal characteristics, visual aids (Freeman-Sanderson, Rose & Brodsky, 2020; Hampton et al., 2020; Knollman-Porter & Burshnic, 2020; Marler & Ditton, 2021; Mehta, Venkatasubramanian & Chandra, 2020; Schlägl & Jones, 2020) and the use of alternative masks with transparent windows (McKee, Moran & Zazove, 2020). However, much of the literature around the impact of face masks on patient–clinician relationships is based on expert opinion, with only a few studies exploring the perspectives of service users (Naylor, Burke & Holman, 2020; Pamungkasih, Sutomo & Agusno, 2019; Saunders, Jackson & Visram, 2020; Wong et al., 2013), possibly due to the widespread use of face masks in Western culture being only a recent phenomenon. Further research is therefore needed to understand the perspective of service users and clinical experiences of mask wearing to create an evidence base upon which environment-specific communicative support strategies can be developed (Marler & Ditton, 2021).

Research aims

The aims of the research are the following:

- To understand the perspectives of pwCD around the impact of staff wearing face masks on the experience of stroke rehabilitation.
- To understand staff perspectives on how stroke rehabilitation for pwCD is affected by staff wearing face masks.
- To explore strategies that might improve the experience of rehabilitation on a stroke unit for pwCD when staff are wearing face masks.

The opinions of health professionals (HPs) as well as pwCD are sought in recognition that communication and rehabilitation is a two-way process, and to seek HPs’ opinions about the impact on pwCD whose severity of impairment might prevent involvement within this study.
TABLE 1  Eligibility criteria

| Participants | Inclusion criteria                                                                 | Exclusion criteria                                                                 |
|--------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| PwCD         | ● Diagnosis of stroke                                                               | ● Unable to provide informed consent                                               |
|              | ● Communication difficulty resulting from stroke (aphasia, apraxia of speech, dysarthria, cognitive communication difficulties) | ● Unable to engage in a supported 1:1 interview due to the severity of cognitive and/or language impairment |
|              | ● Inpatient on a stroke rehabilitation unit                                        | ● Unable to engage in a supported 1:1 interview due to being medically unstable or not alert enough |
|              | ● Medically stable and alert enough to take part in an hour-long interview          | ● Moderate, severe or profound hearing loss; current diagnosis of depression or psychiatric illness; current diagnosis of dementia, that is, potential confounding factors in the service user’s experience of face masks |
|              | ● Cognition and language skills adequate to provide informed consent and participate in an interview, as assessed by their SLT. For example: | |
|              |   • Comprehension at least single word level (spoken or written)                    |                                                                                   |
|              |   • Ability to express opinions, e.g., with the support of a total communication approach |                                                                                   |
| HP           | ● Staff member on a stroke rehabilitation unit                                      |                                                                                   |
|              | ● Experience of providing stroke rehabilitation to PwCD whilst wearing a face mask  |                                                                                   |

METHODS

The research is guided by a relativist ontology, and a constructivist epistemological paradigm. The underlying assumptions for this project are that reality depends on how humans mentally construct their ideas of the world, and that knowledge of how things are relates to how individuals come to understand it within specific social, cultural contexts (Braun & Clarke, 2013). A qualitative approach, recognizing the importance of context and subjectivity, is therefore used. The methodological approach is based on hermeneutic phenomenology, with the aim of understanding the essence of participants’ lived experiences in relation to the current context. Semi-structured interviews and a focus group were conducted with PwCD such as aphasia, dysarthria and cognitive communication difficulties, and HPs on a stroke rehabilitation unit. The data were analysed using reflexive thematic analysis (Braun & Clarke, 2006). Ethical approval for this study was gained from the North-West Liverpool Central Research Ethics Committee (REC reference 21/NW/0107).

Recruitment

Opportunity sampling of participants at a single specialist stroke rehabilitation inpatient unit was used to facilitate recruitment whilst minimizing infection risk during the current pandemic. All PwCD on the stroke unit who met the eligibility criteria (Table 1) during the period of data collection were approached by their regular speech and language therapist (SLT) and supported to understand an accessible information sheet. The researcher (primary author, PC) followed up with those who indicated interest in taking part and obtained formal consent at the time of the interview. Potential participants were excluded if there were concerns about capacity to consent. Where multiple participants were available, the researcher used purposeful sampling in order to ensure that a range of communication difficulties was represented to reflect the diversity of communication difficulties in the stroke population.

All HPs working on the stroke unit were invited to attend a focus group via email or verbal invitation by the unit’s regular SLT. Once verbal consent was gained, the researcher followed up with additional information and formal consent. The focus group was carried out via Microsoft Teams.

Participants

Six PwCD and five HPs were recruited to take part in the study. All PwCD were aged over 60 years and White British, of which five were male and one female. Participant details as recorded in the medical notes are listed in Table 2.

Participants in the focus group included one rehabilitation assistant, one physiotherapist, one SLT and two registered nurses. All staff taking part in the focus group were White British. The number of years of clinical experience ranged from 8 to 42 years (mean = 24.2), with years working with stroke patients ranging from 2 to 32 years (mean = 8.8). There were two male and three female participants.
| Participant | Age range (years) | Type of stroke | Length of stay at the time of the interview (days) | Previous experience of stroke rehabilitation | Communication difficulty at the time of the interview |
|-------------|------------------|----------------|-----------------------------------------------|-----------------------------------------------|--------------------------------------------------|
| pwCD1       | 80–90            | Left thalamic haemorrhage | 83 | No | Mild to moderate cognitive communication difficulties |
| pwCD2       | 80–90            | Left middle cerebral artery infarct | 14 | No | Mild expressive aphasia |
| pwCD3       | 80–90            | Lacunar infarct | 52 | Yes | Mild dysarthria |
| pwCD4       | 70–80            | Left cerebellar and mid-brain infarct | 60 | No | Moderate dysarthria and mild cognitive communication difficulties |
| pwCD5       | 60–70            | Left middle cerebral artery infarct | 27 | No | Mild expressive and receptive aphasia |
| pwCD6       | 70–80            | Left middle cerebral artery infarct | 19 | No | Moderate to severe expressive and mild receptive aphasia |

**Interview format**

The interviews and focus group were conducted over a 3-month period from April to June 2021. The researcher works as a SLT specializing in stroke, with experience of working on stroke units during the current pandemic. An effort was made to recruit participants where the researcher does not work clinically: only one pwCD and one HP had met the researcher in their clinical capacity prior to the research. Time was spent explaining the researcher's role to avoid therapeutic misconception.

One-to-one interviews were held in pwCD's individual rooms on the stroke unit, and audio- and video-recorded. The focus group was held and recorded over Microsoft Teams to minimize infection risk. A focus group was used to encourage a broad scope of ideas and explore the topic in more depth from the perspective of HPs. The interviews and focus group followed loosely structured topic guides (see Appendices 1 and 2 in the additional supporting information), with questions drawn from the literature by the researcher to stimulate discussion relevant to the research aims. The structure was flexible to enable participants to discuss issues important to them, generate novel ideas and allow adaptation to an individual's communication needs. Example questions and visual resources were reviewed by members of a local Stroke Association group, including pwCD and their partners. As a result of feedback, minor adjustments to questions and picture resources were made to maximize clarity. The full topic guides were reviewed by a peer researcher.

The researcher supported communication needs as required, for example, by: identifying facilitative strategies in advance from their regular SLT; using visual aids relevant to the research question; using simple and closed questions to elicit perceptions; using Talking Mats (Murphy, Cameron & Boa, 2013); and encouraging use of total communication strategies. To ensure credibility, the researcher clarified answers to ensure accurate interpretation, balanced the need to support communication with an awareness of the need to avoid leading the participant, and used video-recording and photographs of contextual information to monitor interviewer influence and ensure that verbal and non-verbal responses were accurately recorded. The researcher also thoroughly recorded the process of research, with documented decisions about how conversations were supported and interpreted, and reflexive diaries recording the context, research experience, methodological issues, and emerging ideas and concepts.

**Interview analysis**

The researcher undertook all transcription as part of the process of familiarization and data analysis. Data were
transcribed orthographically, with particular care being
taken to record non-verbal communication alongside ver-
bal utterances, and checked alongside audio- and video-
recordings for accuracy. All data were analysed using
reflexive thematic analysis, according to the six phases out-
lined by Braun and Clarke (2006). This is a widely recog-
nized, accessible method, which can be compatible with
a constructionist paradigm, used across different forms of
data and provide a rich account of data (Braun & Clarke,
2006).

The transcripts were read repeatedly for familiarity with
the data, and full and equal attention was given to each
data item. The dataset was manually coded using QDA
miner lite software (PROVALIS Research, 2020). Anal-
ysis was carried out at a latent level in an attempt to
examine the underlying ideas, assumptions and conceptual-
izations (Braun & Clarke, 2006). A peer researcher
was asked to review extracts of the anonymized transcript
and to offer an insight from an alternative interpretation
that supported in-depth interrogation of the data. Initial
themes were identified using ‘mind mapping’, which were
repeatedly reviewed until distinctive main themes and
subthemes were identified.

The researcher played an active role in searching for
and identifying patterns within the data, and acknowl-
edges the additional dimensions added by researcher sub-
jectivity. The reflexive notes reveal an awareness of the
need to delineate personal preconceptions about the dis-
advantages of using facemasks within a therapeutic setting
from the participants’ own points of view, and care was
taken to differentiate ‘self-generated’ inductive ideas from
‘interviewer-generated’ deductive ideas.

RESULTS

Following the initial coding process, subthemes were ident-
ified and then refined and organized into four main
themes: face masks as a barrier to effective communica-
tion; face masks as a barrier to human connection; the
extent to which face masks impact an individual; and the
need for service provision to evolve. The participants’ com-
ments, subthemes and themes interact with each other
(Figure 3) and should be considered alongside each other.

Theme 1: Barrier to effective
communication

Communicating effectively is an essential part of the HP’s
role and remains paramount despite, and perhaps because
of, face mask use, with participants highlighting the impor-
tance of ensuring mutual understanding. PwCD2 states
‘if I didn’t [understand], then [staff] wouldn’t be doing
their job’. The face is described by HP4 as part of the
professional’s toolkit or ‘machinery’. When covered, staff
need to prioritize alternative ways of ensuring effective
communication:

HP4: if you haven’t got a face, you have to find some-
thing else to communicate.

1a: Communication breakdown

Communication breakdown is a significant consequence
of staff wearing masks:

PwCD5: It’s a breakdown of communication so—in
some ways ... the mask breaks it down.

Participants recognized that face masks result in a ‘dis-
torted’ (pwCD4) or ‘muffled’ (HP3) voice, which can then
result in difficulties understanding. This is important to
pwCD:

pwCD5: I need to be able to understand what they’re
saying but I, I can’t.

Misinterpretation can arise as a result of the screening of
facial expressions. Staff in particular showed awareness of
how the reduction in facial cues may result in other non-
verbal cues being heightened, or nuance normally con-
veyed by facial expression being lost. The intended mes-
 sage can therefore be misinterpreted:

HP5: It’s a bit like a text message ... in that it can be
perceived in lots of different ways

Face masks were also described as affecting individuals’
ability to follow turns in conversation, so that ‘patients are
not keeping up with who’s being spoken to’ (HP3). As a
result of this, HPs reported having to use strategies such as
being clearer amongst themselves on who is leading the
session, repeating information and taking longer within
sessions because of communication breakdown.

HPs wearing face masks not only affects pwCD’s abil-
ity to follow conversation. Whilst some pwCD indicated
via Talking Mats that talking was easy, others showed that
face masks have a specific impact on the confidence in
their own talking and ability to have ‘a proper conversa-
tion’ (pwCD5). Communication breakdown resulting from
face mask use is of particular importance to a client group
that already experiences frequent communicative barriers,
and who might be reliant on non-verbal cues to interpret
information:
HP2: some of the ... non-verbal cues that are really important to aid their understanding are either removed or dampened down because of the masks.

The impact of communication breakdown can also apply equally well to family members without communication difficulties, with the potential then to impact the service user as a result of them not being so ‘informed’ or ‘insightful into the level of their difficulties’ (HP2).

1b: Visual resources and non-verbal cues

HPs describe compensating for face covering by using non-verbal strategies such as using gesture, smiling with their eyes (HP5), and focusing on using the ‘whole of your face’ (HP4) to communicate. It is perhaps the ability of pwCD to benefit from non-verbal cues regardless of verbal language skills which meant the majority of participants interviewed favoured use of gesture and body language to facilitate communication. In addition, HPs describe having to demonstrate either personally or through technology, to facilitate comprehension of what they are trying to achieve:

HP2: we might record [exercises] on an iPad so that the patient can watch it … and see somebody’s face, or use an App … that contains a video of lip placement.

Use of ‘visual clues’ (HP4), such as photographs, videos and communication books, can support participation in rehabilitation, reinforce messages, clarify understanding and allow people to ‘find a break out’ (HP4) from the potential frustration of communication breakdown.

Theme 2: Barrier to human connection and building therapeutic relationships

Comments raised by both HPs and pwCD reflected the theme of face masks acting as a barrier to human connection and relationship building within a therapeutic setting. As a result of this barrier, some pwCD’s responses indicated that they valued strategies designed to put the individual at ease and reassure the person of ongoing human contact, such as taking time to build a relationship, using a positive tone of voice or providing physical help and verbal encouragement.

2a: Facial recognition

There was an understanding amongst pwCD and HPs that face masks can impact facial recognition, with the potential to ‘forget who you’re talking to’ (pwCD3). HPs noticed an increased need to introduce themselves and their roles. Reduced facial recognition has the potential to disrupt the process of building a therapeutic relationship, although pwCD4 indicated, through responses to closed questions, that once the relationship is established the impact of face masks becomes less important.

2b: Connection and trust

By covering the face, masks present a barrier to a means of joy and human connection for pwCD. The physical barrier can create feelings of distance for the service user. PwCD5 describing feeling ‘isolated’ as a result of the ‘barrier’, and pwCD4 commented: ‘all you see is the mask … you don’t actually see the person behind the mask’. For some pwCD, the fact the other person is wearing a mask might result in changes to their perceptions of whether they trust what the person is saying:

PwCD4: you just don’t tend, tend to believe so much.

This has implications for feedback and building therapeutic relationships:

PwCD5: you can’t really build a relationship through a mask … much as you’d like to, you can’t.

2c: Mood and disengagement

There was some discrepancy between HPs and pwCD regarding the impact of face masks on mood. The pwCD interviewed did not feel that the use of face masks had a direct impact on their mood, with pwCD2 even suggesting their mood was enhanced in ‘appreciation of [staff’s] efforts’. However, HPs recognized reduced access to facial expression as a potential issue:

HP3: I think the basic joy and happiness of seeing a smiling face has had the biggest impact of all … I’d say the patients are more depressed, lower mood.

There is the potential to impact people’s self-perception: pwCD5 describes a dislike of face masks, indicating that masks make them feel like a ‘third class citizen’. Other participants recognize the pleasure inherent in being ‘face to face’ (pwCD4). PwCD5 describes a sense of connection and pleasure in seeing a therapist smile or laugh in response to them: an altered two-way connection might result in reduced engagement when face masks are used. HPs indicated that this is particularly the case for those who have limited access to verbal means of connection:
Theme 3: Factors affecting the extent to which an individual is impacted by face mask use

The extent to which the above barriers appeared to impact pwCD and the rehabilitation process varied extensively, as shown by a range of responses on Talking Mats scales and verbal comments (Figure 1).

PwCD1 describes face masks not making 'a damn bit of difference', whereas for pwCD5 the impact would be quite high:

Interviewer: any other difference that seeing that facial expression makes for you?

PwCD5: oh everything… I can hear, I can see if they’re smiling.

The level of acceptance of face mask use and overall impact of face masks are affected by multiple factors, with variation between participants, but also within participants themselves, according to different internal and external factors.

3a: Level of acceptance

Most participants indicated that they felt wearing face masks is in some respects the norm, ‘bread and butter’ or a ‘necessity’ (pwCD2), born out of the need for protection—the primary objective of wearing masks. When asked to reflect upon the impact of masks, the necessity of wearing PPE was used as a justification for accepting potential negative consequences:

HP1: for speech and language patients the engagement isn’t there as much, they seem to get bored of the sessions a bit quicker

PwCD4: I understand there, there’s gotta be a mask ((pause)) because of the pandemic … and whatever it comes it comes.

Acceptance appears to be heightened by a recognition that this is an altruistic act on the part of the healthcare staff, done ‘for me’ (PwCD6) or ‘my benefit’ (pwCD2). Furthermore, there was an awareness that face masks are ‘required’ (pwCD2) rather than the choice of the HP. However, whilst recognizing the necessity, pwCD5 demonstrates the fact that levels of acceptance can vary:

PwCD5: [I’m] frustrated at [staff] because ‘why do you have to keep wearing these masks all the time?’ … well I can understand why they do, don’t mean I have to like it though.

3b: Internal factors

Levels of acceptance and the extent to which face masks impact individuals appear to be influenced by factors internal to the individual. It was apparent that participants had distinct opinions related to the management of Covid, the protectiveness of different PPE and whether face masks were even required in certain situations. Similarly, participants had differing internal emotional reactions to masks in general. PwCD5 describes hating masks, and how the use of masks is confronting, which rather than allowing her to feel well is a ‘reminder that you’re in hospital’. On the other hand, pwCD6 used a combination of words, gesture and responses to closed questions to explain that the consequences of face mask use appear insignificant to him currently given the need to adjust to his stroke-related impairment. Whereas for pwCD5 face masks evoke a strong emotional response, face masks may be seen as just
a ‘small drop in the ocean’ in the context of other restrictions (HP3) or the individual’s life situation.

The individual’s stroke-related impairment will also influence to what extent face mask use has an impact. HPs indicated that mask use can interact with a range of impairments including visual field loss or cognitive impairment:

HP2: if they haven’t got that cognitive ability to be able to adapt … then their engagement in the speech therapy hasn’t been so great because they’ve got no means of getting through the barrier that the masks provides.

HPs emphasized the need for additional strategies in particular for pwCD, cognitive impairments or hearing loss, with a potentially ‘bigger impact’ (HP3) of mask use on those with speech and language needs. PwCD validated the fact that face masks act as an additional barrier: combined with a communication impairment they can be yet another cause of breakdown. The need to avoid communication breakdown is therefore particularly acute for those who already experience their own communication difficulties:

HP4: when we can’t communicate or we feel we’re getting frustrated, particularly with someone who has got hard of hearing or expressive dysphasia and they’re making no sense to you … you’ve got to find a break out from that ‘cos otherwise … you’re just working to bang your heads together.

3c: External factors

Participant comments also suggested that the extent to which face mask use impacts is dependent on situational-specific external factors. Examples included what you are doing in the session, whether someone has an accent, whether there is background noise or distractions, how many people are in the room, the level of familiarity with the person you are talking to and even the topic of conversation:

HP3: sometimes you are giving really bad news … and those are miserable messages to put across at the best of times let alone when you can’t show any empathy on your face.

The level of impact on face mask use has may depend on what is happening in therapy, with pwCD4 and HPs noting particular difficulties in speech therapy sessions. This is likely due to the benefit of seeing mouth movements: ‘when you’re trying to get them to copy you, to mouth words ‘n make sounds’ (HP1).

In recognition of these internal and external factors, staff felt it was important to talk about face mask use and the potential impact, to explore this with pwCD. HP4 suggests: ‘acknowledging it to the patient, saying “this could be hard for you, this is hard” … naming the elephant in the room’.

**Theme 4: Service provision has needed to evolve to meet patients’ needs**

Awareness of the way in which service provision has evolved, and the ways in which staff have had to alter their communication style was in particular discussed by HPs. The need for this was validated by pwCD’s experiences of communication breakdown during rehabilitation, and comments which emphasized the need for tailored, individualized strategy use.

4a: Adapt communication

As a result of mask use HPs have had to universally adapt their communication style, but perhaps in particular for pwCD:

HP2: I think we’re making those adaptations for everybody but then we’re having to go a a bit extra for people with communication difficulties.

Adaptation of communication style has involved amplification of certain strategies, for example, increasing use of gesture, giving more frequent explanations or introductions, or amplifying facial expressions. HP4 describes carrying ‘on being your normal self’ but ‘exaggerating it slightly’. In contrast, in some situations there is the need to pare down communication to make it clearer, in particular in distracting environments, because of the impact of face masks on turn dynamics and communication:

HP3: they might mistake what you’ve said, so you have to be really crystal clear and stop the distractions.

4b: Evolution of service to provide high quality care

The need for change goes beyond individuals changing their communication style. HPs discussed how the whole service has had to evolve as a result of face mask use:
HP3: I think that we’ve evolved with this change … and I think that we’ve embraced the change, I think that we’ve built things in.

This was seen by some staff members as necessary in order to continue providing ‘great quality care’ (HP2) and to avoid negative impact outcomes. Whilst it was recognized that face mask use does impact to an extent rehabilitation sessions, most pwCD used Talking Mats to express the low level of impact that face masks have had on therapy tasks (such as setting goals and exercises), and felt that their therapy goals had been achieved. It is possible that the high quality of rehabilitation was upheld due to adaptations that HPs have put in place.

The ability to adapt will be guided by policy, with participants showing an awareness that the ability to put into place certain strategies (such as removing face masks, wearing transparent masks) will be affected by national policy, local policy and constraints such as availability of resources.

4c: Tailor strategy use

Despite the need to adapt and evolve, it is recognized that not all strategies are necessary or appropriate for all pwCD. Inherent within pwCD’s comments was the implication that certain communication strategies were something they either liked or were not personally preferable. For example, when asked why ‘use of videos’ was placed under ‘make things worse’ on the Talking Mats scale, pwCD1 stated: ‘the way it captures my interest. … They’re not of sufficient interest to me’. Some participants were also clear that they thought some strategies, whilst potentially helpful for others, were not necessary for them personally.

In order to facilitate discussion, pwCD were asked to rate on a Talking Mats scale whether strategies made their experience ‘better’, ‘worse’ or ‘no different’. It was clear from their responses (Figure 2) that each individual had distinct opinions regarding whether strategies were facilitative or barriers.

Some strategies suggested as helpful in the literature were perceived by some participants as at best unnecessary, and at worse as having a potential negative impact, describing some strategies such as talking more slowly or using a positive voice as ‘condescending’ (pwCD5) or ‘awkward’ (pwCD6). Some pwCD recognized strategies as helpful but did not feel that face mask use meant that these were required any more frequently than usual, whilst others felt that some strategies are particularly helpful when face masks are in place. It is therefore paramount for the HP to tailor strategy use and be aware of the situation, individual, and their preferences:

HP4: I think it’s that constant being aware of the patient’s position which you’re coming into.

Interconnectedness of themes

The subthemes and themes interact dynamically with each other (Figure 3).

Interaction within themes and between subthemes is clear in comments about internal (3b) and external factors (3c) that affect the level of impact face masks have: HP3 describes how when external regulations change, people’s individual perceptions around face masks might change too; individuals’ internal opinions about face mask use appeared linked to the external setting, with a hospital environment potentially exacerbating emotional responses to face mask use:

HP2: for our patients to be speaking to somebody who’s wearing a face mask can be really alien in an … already very isolating and alien environment.

There is also clear interaction between different themes. Someone’s internal feelings towards face mask use in a rehabilitation setting (3b) as well as the overall level of acceptance (3a) and impact (3) could be affected by multiple factors, such as communication breakdown experienced (1), mood (2c) or connection with the therapist (2b): pwCD4, for example, described how the effect of face mask use became less prominent once you ‘know’ staff. Conversely, someone’s internal communication impairment (3b) interacts which face mask use to control how effective communication exchanges might be within a rehabilitation setting (1) in the first place.

Decisions about how to adapt service provision and communication (4) should likely be based on consideration of all other three themes (1–3). An example might be that if face masks are creating a barrier to effective communication (2), then the HP should consider the extent to which this interacts with other factors (3), and consider use of tailored strategies (4b) such as visual resources (2b) as part of adapting their communication style (4a). In an inverse relationship, the extent to which the service evolves and adapts (4) is very likely to then impact how much of a barrier face masks pose (1 and 2) and the extent to which face masks have an impact (3).
DISCUSSION

This research is the first study of its kind to explore the opinions of pwCD post-stroke in relation to face mask use. Whilst studies have used questionnaires and rating scales to explore people’s attitudes and perceptions (Naylor, Burke & Holman, 2020; Wong et al., 2013), this study is unique in using reflexive thematic analysis to gain an in-depth understanding of the service user experience, and in gaining the opinions of pwCD resulting from stroke.

Barrier to communication

The perception of participants within this study that face masks have the potential to impact communication within healthcare echoes concerns raised via experts about the impact of face masks amongst other service user groups. Participants’ perception of face masks affecting the acoustic signal and speech discrimination is supported by evidence (Corey, Jones & Singer, 2020; Hampton et al., 2020). However, it is evident that the ability for face masks to impact within a conversation goes beyond comprehension.
Participants’ comments reflected concerns of some experts in the field of mental health, who highlight the potential for face masks to impact the interpretation of non-verbal cues (Mehta, Venkatasubramanian & Chandra, 2020), an issue particularly relevant to people with aphasia who may have reduced access to auditory cues and information.

Unique insight was gained from pwCD into how they felt other factors, such as their own communication impairment, interacted with the effectiveness of communication when someone was wearing a face mask. The importance of effective communication within a rehabilitation setting was evident and is supported by proponents of communicatively accessible healthcare services (Kagan & LeBlanc, 2002). This issue becomes particularly relevant where face masks are used due to their additional contribution to communication breakdown, with a potential knock-on effect on experience of rehabilitation and the effectiveness of care.

**Barrier to human connection**

The potential for face masks to impact connection and trust has been raised in relation to those with a mental health diagnosis (Veluri, 2020) but also the general population (Kratzke et al., 2021; Saunders, Jackson & Visram, 2020; Wong et al., 2013). Trust is an important currency within neurorehabilitation and the fact that face masks could impact the level of trust between pwCD and HPs may in turn impact care outcomes. This altered perception of trust and judgement is likely to be related to difficulty in reading emotions when face masks are in situ (Carbon, 2020), and is perhaps accentuated due to pwCD’s reliance on non-verbal communication. The use of face masks was also felt to impact factors such as engagement, a multidimensional construct co-created between the clinician and service user, and therefore affected by the change in communication and relationship dynamics that face masks bring. Whilst the pwCD within this study did not feel that their overall rehabilitation outcomes had been affected by face mask use, particular attention and time may need to be given to building a working alliance given the potential for this to influence rehabilitation outcomes. The importance of achieving therapeutic connection despite face mask use is paramount as people with aphasia are known to be at higher risk of social isolation (Cruice, Worrall & Hickson, 2006).

**Level of impact**

There was significant variety within participant points of view, reflecting the fact that multiple factors impact how much face mask use interferes with the rehabilitation process. HPs may find themselves having to address people’s internal reactions and opinions about face mask use, given the potential for this to then impact their level of acceptance and overall experience of rehabilitation. There is also the need to consider other internal factors and situational external factors which may mean that face mask use has a more significant impact on the individual. Factors identified (e.g., background noise and the speaker’s accent) are reflective of general barriers to pwCD, which are likely magnified when an additional barrier (the use of face masks) is in place. Furthermore, face masks may have more of an impact in certain rehabilitative sessions. Whilst non-verbal communication is important across multiple disciplines, participants confirmed that the emphasis on talking and the use of facial cues as part of the SLT’s toolkit means face mask use could have the most impact within speech and language therapy sessions, as well as for those with the highest communication needs. This research therefore highlights the need to be particularly aware of the impact of face mask use amongst those with significant communication difficulties.

**Adaptation**

The HPs interviewed in the focus group indicated that service adaptation was essential to maintaining outcomes when carrying out stroke rehabilitation with face masks in use. The need for service provision to evolve echoes multiple papers suggesting compensatory strategies. Examples of these strategies arising in the literature (see Appendix 3 in the additional supporting information) were discussed with participants to stimulate discussion. The main finding related to use of these strategies was that one list of strategies cannot be applied across multiple different people due to distinct preferences and needs even across a small sample of pwCD: the requirement to tailor strategies to the individual and context is paramount. The need for HPs to tailor strategies to compensate for face mask use aligns with principles of person-centred care (McCance, McCormack & Dewing, 2011) and is in line with stroke rehabilitation guidance which urges professionals to consider ‘individual needs, preferences and values of the patients’ (National Institute for Health and Care Excellence (NICE), 2013: 2) alongside evidence and recommendations.

**Interaction of themes**

In order to fully reflect upon the impact of face mask use for an individual with communication difficulties
post-stroke, all themes need to be considered alongside each other. There is considerable interaction between themes. For example, the extent to which face masks present a barrier and affect an individual may drive the need for service adaptation, but on the other hand service adaptation might prevent face masks becoming a barrier or affecting an individual in the first place. A holistic consideration of the individual, internal and external factors, and an open exploration with pwCD as to how face masks are impacting on them can allow HPs to adapt their service in the most appropriate and effective way.

SUMMARY

In the UK, despite a relaxation in the guidance for the general public in July 2021, the government continued to promote hospital staff wearing face masks to prevent the spread of SARS-CoV-2 from the wearer. Given decreased incidences of other diseases it is possible face masks will be considered as part of a long-term strategy within healthcare settings. It is therefore important to represent the concerns and issues relevant to a population which has not to date been given voice on this issue within research literature. This study provides an important insight into how face masks might impact the rehabilitation process, and encourages HPs to consider their role in adapting and evolving to continue providing high quality care for pwCD.

Limitations

This is a qualitative study with a small number of participants. The study findings are therefore not intended to be generalized, and context is provided to support the reader to decide upon transferability to other settings. The reduced diversity within the cohort of HPs (e.g., in terms of role) and pwCD is a limitation to the study. The need for pwCD to be able to formally consent and partake in an interview meant that those with more severe communication difficulties were not able to take part. Furthermore, the limited number of participants meant that a full range of communication difficulties and age ranges were not represented. For example, the study does not address experiences related to apraxia of speech, which is of particular importance since therapy approaches used with this client group focus on viewing articulation that is modelled by the therapist. Phenomenal variation and a focus group with staff was used in an attempt to represent a broad, although not complete, range of perspectives.

The length of interview (approximately 45 min) was recommended by a stroke survivor in the patient and public involvement group. This was a short timeframe within which to explore an issue in depth with this client group, but also fatiguing for some pwCD. On reflection, it is likely that multiple interviews would have supported pwCD to explore the issue in more depth whilst managing the effects of fatigue. The high communication needs of some participants meant that the researcher had to balance the need for communication support against the potential to ‘lead’ the participant. The increased researcher presence and possibility for misinterpretation of meanings within this client group is acknowledged and discussed in this report.

Clinical implications

This study has explored the perspectives of pwCD and HPs on how face mask use impacts stroke rehabilitation. The results allow an increased understanding of influencing factors and the barriers that face masks can present to pwCD, but emphasize the variety in each individual’s experience. The data emphasizes the importance of tailoring strategies (e.g., see Appendix 3 in the additional supporting information) to the individual and different contexts: an ongoing process of evaluation is therefore required as well as an open discussion with each individual with communication difficulties. As one participant suggests, HPs should address the ‘elephant in the room’ and openly discuss the impact of face masks with pwCD.

SLTs may be particularly well placed to explore individual perceptions and influencing factors related to face mask use, using strategies such as Talking Mats. SLTs can then advocate the most beneficial strategies, sharing information with the team, for example, within communication passports. An individualized understanding of the impact of face masks will allow HPs to then personalize and adapt their care. There is a role for SLTs in training staff in a rehabilitative setting on strategies for overcoming communication barriers, and in raising awareness of the potential impact of face masks on pwCD post-stroke. This should be done alongside an ongoing discussion with service users about their perceptions of the impact of face masks upon them.

This research is an initial investigation into a small number of HPs and pwCD’s views, and emphasizes the need for there to be broader discussions amongst service users, clinicians and healthcare managers about the beneficial and potential adverse effects of face masks. These views need to be explored fully to make informed decisions about when to wear face masks, and to ensure that healthcare services evolve to effectively support pwCD when face coverings are required.
Implications for future research

This study presents an initial investigation into the impact of face masks on the experience of rehabilitation for pwCD. Future research with a broader scope of participants (e.g., including people with apraxia of speech) and in different settings would strengthen and enrich findings. Further research into the perspectives of a range of service user groups would provide HPs with a deeper understanding of what factors might impact people’s experiences of healthcare when face masks are in use. An exploration of the impact of different strategies (e.g., on comprehension or levels of engagement) would increase confidence in knowing which strategies would be most effective for service users.

This study has made a novel contribution to our understanding of how face mask use might impact pwCD post-stroke. The research data indicates that whilst face masks can present barriers to rehabilitation, an understanding of factors that influence upon individuals, and HPs’ willingness to evolve and adapt can maintain positive outcomes in the face of these barriers. HPs’ existing skills in adapting and individualizing therapy to provide personalized rehabilitation should be employed in the face of ‘masked’ care.

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CONFLICT OF INTEREST

The authors report no conflict of interest.

DATA AVAILABILITY STATEMENT

Anonymized data supporting the findings of this study are available from the corresponding author within one year of publication upon reasonable request.

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**SUPPORTING INFORMATION**

Additional supporting information may be found in the online version of the article at the publisher’s website.

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