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***“The vaccination is positive; I don't think it's the panacea”*: A qualitative study on COVID-19 vaccine attitudes among ethnically diverse healthcare workers in the United Kingdom**

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Abstract

Background

Globally, healthcare workers (HCWs) are prioritised for receiving vaccinations against the coronavirus disease-2019 (COVID-19). Previous research has shown disparities in COVID-19 vaccination uptake among HCWs based on ethnicity, job role, sex, age, and deprivation. However, vaccine attitudes underpinning these variations are yet to be fully explored.

Methods

We conducted a qualitative study with 164 HCWs from different ethnicities, sexes, job roles, migration statuses, and regions in the United Kingdom (UK). Interviews and focus groups were conducted using Microsoft Teams or telephone, and recorded with participants' permission. Recordings were transcribed and thematically analysed following an inductive approach.

Findings

We conducted an in-depth analysis of 53 randomly selected transcripts (involving 82 participants) to generate rapid evidence. Four different vaccine attitudes were identified: Active Acceptance, Passive Acceptance, Passive Decline, and Active Decline. Factors influencing vaccine acceptance include: knowledge of vaccine; risk perception; positive attitude towards other vaccines; social influences; and considerations about the future. Correspondingly, barriers to vaccine acceptance were identified as, low trust in the vaccine and historical (mis)trust, inadequate communication, and inequities in delivery and access. Opinion on mandatory vaccination was divided.

Interpretation

Our data show that vaccine attitudes are diverse and elements of hesitancy may remain even after vaccine acceptance. This has implications for the sustainability of the vaccine programme, particularly as new components (e.g. boosters) are being added. Based on our findings we recommend trust-building, designing inclusive and accessible information, and addressing structural inequities for improving vaccine uptake among HCWs.

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1. INTRODUCTION

In response to the devastating morbidity, mortality, and economic impact of the COVID-19 pandemic, the scientific and pharmaceutical community worked at pace to fast-track the development of a vaccine against Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). In December 2020, the first vaccine against COVID-19 was approved for emergency use in the United Kingdom (UK) (1). Soon after, COVID-19 vaccination programmes were rolled out, and health and social care workers were prioritised for vaccination due to their increased risk of exposure and transmission, and their significant influence on vaccination uptake in the wider community (2).

Uptake of vaccines by healthcare workers (HCWs) has been influenced by vaccine hesitancy (3-8), which is defined by the World Health Organization (WHO) as “delay in acceptance or refusal of safe vaccines despite availability of vaccine services” and considers vaccine attitudes and behaviours to be part of a continuum that varies depending on time, place, and vaccine (9). Research has also shown disparities in vaccination uptake among HCWs from some ethnic minority communities, with evidence that these communities may be at increased risk of infection (10, 11). However, there remains a gap in understandings of vaccine attitudes or the factors influencing these attitudes among HCWs from diverse ethnic backgrounds.

The concept of vaccine hesitancy marks a departure from the conventional binary understanding of pro- and anti-vaccine attitudes. It has come to encompass the range of beliefs, attitudes, and behaviours which lie between the two end points of acceptance and refusal (12). The most widely cited model of vaccine hesitancy has been proposed by the WHO, which conceptualises vaccine hesitancy as a continuum lying between ‘*Accept all*’ and ‘*Reject All*’ and influenced by the 3Cs of confidence, convenience, and complacency (9). Another significant and early classification of vaccine attitudes was presented by Mark Nichter, an American anthropologist, who distinguished between *active demand* (adherence by an informed public) and *passive acceptance* (compliance to recommendations and social pressure) while looking at vaccine demand in low- and middle-income countries (13). Nichter’s description of ‘*passive acceptance*’ particularly resonates in the current climate around COVID-19 vaccination where social norms or social influences are informing vaccine uptake (14). As Yakub et al. (15) remarked, high rates of vaccine coverage often mask those who have hesitancy but accept vaccinations, but if this hesitancy is not understood and addressed in a timely way, the effectiveness and sustainability of vaccination programmes could be jeopardised.

Vaccine hesitancy is contextual and influenced by a host of psychological, social, and demographic factors such as age, gender, religious considerations, knowledge of health systems, public health messaging and communication, and social and political beliefs (16, 17). In the UK, studies have found significant differences in COVID-19 vaccine uptake among HCWs based on ethnicity, job role, sex, age and, deprivation (11, 18, 19). While differentials in COVID-19 vaccine uptake among HCWs in the

UK have been identified, comprehensive understanding of vaccine attitudes underpinning these variations are yet to be fully explored. Understanding vaccine attitudes and factors influencing these attitudes is critical in light of the recent decision to roll-out of COVID-19 vaccine booster doses to HCWs in England (20), and also the ongoing deliberations on making COVID-19 vaccination mandatory for HCWs. In order to address these key questions, we carried out qualitative research to investigate (a) HCWs attitudes towards the COVID-19 vaccine; (b) their perceptions about the vaccine; and (c) factors influencing vaccine decision making.

2. METHODS

2.1. Study design, setting, and population

This qualitative study is part of a larger project, the United Kingdom Research study into Ethnicity And COVID-19 outcomes among Healthcare workers (UK-REACH), an Urgent Public Health (UPH) study to generate rapid evidence on COVID-19 outcomes among HCWs from diverse ethnic backgrounds in the UK. This qualitative study was specifically designed to explore, in an in-depth manner, HCWs' experiences, their perceptions of risks, safety and protection, fears and concerns, support and coping mechanisms while working during the pandemic, and attitudes and perceptions about the COVID-19 vaccine (21). We included adult HCWs (≥ 16 years of age) with experience of working in healthcare settings (e.g. hospitals, GP services, community pharmacies, ambulance services, hospital administration etc.) during COVID-19, including both clinical and ancillary staff. HCWs from different ethnicities, sexes, job roles, migration statuses, and UK regions were purposively recruited to obtain a diverse sample. Due to restrictions on travel and social distancing, the study was conducted remotely, and all processes including, recruitment, consent, and data collection were completed online.

2.2. Recruitment

Data collection for this study was carried out between December 2020 and July 2021. We recruited participants through email invitation via National Health Service (NHS) organisations, collaborators, our stakeholder group (UK-REACH STAG), and Professional Expert Panel (PEP) of HCWs involved in the study (21). We also advertised the study on Twitter and through other online media such as newsletters and websites of partner organisations. In addition to that, we worked closely with gatekeepers in our partner and stakeholder organisations to send out targeted communication regarding the study to their staff/members.

2.3. Data collection

Interested participants registered, provided consent online, and filled in a short online demographic questionnaire, which included information on age, sex, ethnicity, job role, job location, and country of birth. Recruitment was then guided using purposive sampling. Potential participants were invited to take part in either a semi-structured interview or focus group, depending on their choice, which were

conducted either through Microsoft Teams or by telephone. The topic guide was piloted with the first eight participants, and iteratively developed and informed by topics raised during data collection and current events. Key topics included in this guide were: participants' experiences of working during COVID-19; their fears and concerns at work and outside of work; perceived risk factors; challenges faced in accessing information to keep themselves safe; concerns around stigma, discrimination, and racism; facilitators and coping mechanisms; and perceptions about COVID-19 vaccination. Interviews lasted for 45-60mins and focus groups took about 1.5 hours, with group sizes varying between 2 to 7 members. Following their participation, a gift voucher was given to HCWs in recognition of their contribution to the research.

Interviews and focus groups were conducted by MG, FW, AAO, LBN, OH, and IQ who are all trained qualitative researchers and have prior experiences of working with culturally and ethnically diverse communities. Interviews and focus groups were recorded with prior permission of the participants using the recording feature in Microsoft Teams or using an encrypted recorder during the telephone interviews. Recordings were anonymised and transcribed by professional transcribers, and checked for accuracy by the research team.

2.4. Data Analysis

The data analysis approach for this paper was designed to suit the urgent public health implications of the topic and the need for rapid evidence-based research to inform policy and practice on the subject. UK-REACH is among a collection of COVID-19 UPH studies funded by the UK Research and Innovation (UKRI) and National Institute of Health Research (NIHR), UK to provide “rapid response” research to better understand the disease and its impact, collecting real-time information to inform national policy (22). Analysing HCWs' attitudes towards COVID-19 vaccinations is critical for understanding vaccine decision making among staff, and informing future discussions regarding occupational vaccination policies. In this analysis, therefore, generation of themes was informed by data collection across all participants, and a detailed analysis of a randomly selected subset of transcripts, which were rigorously coded and analysed to generate the results presented in this paper.

We primarily adopted a data-driven inductive coding approach (23), but also drew upon Mark Nichter's classification to inform our categorisation of vaccine attitudes. All the researchers familiarised themselves with a set of transcripts and one of the researchers (MG) developed the coding framework and generated the first set of themes based on transcripts from 20 interviews and two focus groups. These were then shared with the team, and iteratively developed based on the sample of selected transcripts and wider data collection. The final themes were arrived at after no new themes emerged from the iterations of these transcripts and all the team members were in agreement with the generated codes and themes.

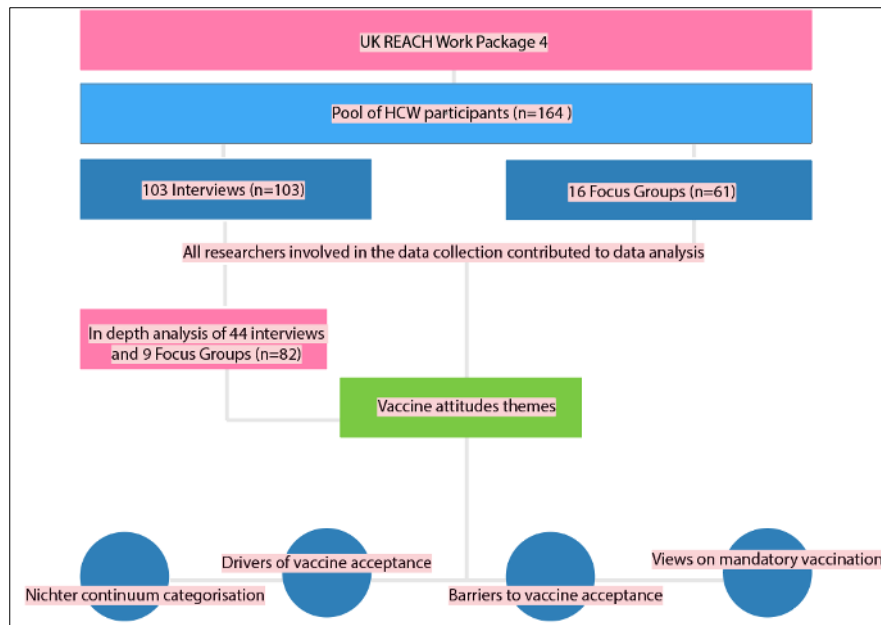


Fig 1: Data collection and analysis flow diagram

3. RESULTS

3.1. Demographic data

We recruited 164 participants from December 2020 until the end of July 2021, and conducted 103 interviews and 16 focus groups with these participants. In this paper, we have included detailed analysis of 44 interviews and 9 focus group (total 53 transcripts), involving 82 participants.

Details of participants are provided in Table 1.

3.2. The COVID-19 vaccine attitude continuum

HCWs participating in the UK-REACH study demonstrated a range of attitudes towards the COVID-19 vaccine, which could be arranged on a continuum with four distinct categories: Active Acceptance, Passive Acceptance, Passive Decline, and Active Decline. The continuum has been inspired by Nichter's 'active demand' and 'passive acceptance' categories, and been extended to include two more categories to cover those attitudes which fall towards the non-acceptance end of the spectrum.

3.2.1. Active Acceptance

Participants who demonstrated 'active acceptance' were those who readily accepted the COVID-19 vaccine, and reported that they were vaccinated or willing to be vaccinated when offered. These participants reported feeling '*optimistic*' about the vaccine and said they felt '*privileged*' and '*lucky*' to have received it. As one participant said in appreciation of the vaccine:

“About the vaccine...there is nothing to be scared about this vaccine. These scientists have done a very, very good job to get us the vaccine. Please, everyone should go for it. There’s nothing, nothing to be scared about. I will assure everybody to go for their vaccine” (P18, Ancillary Health Worker).

Another participant who had not yet been offered a vaccine at the time of interview said,

“I think it’s imperative that we’re all encouraged to get a vaccine. Personally, I’d be very keen to have a vaccine at the opportunity that it’s afforded to me; my wife’s the same” (P4, Doctor).

3.2.2. Passive Acceptance

Participants who demonstrated ‘passive acceptance’ often had one dose or both doses of the vaccine, but had concerns around its safety or efficacy. Participants said that they were initially fearful of the after-effects of taking the vaccine or its long-term effects, but decided to get the vaccine for a variety of reasons. As one participant expressed,

“Obviously, initially I was a bit hesitant about the vaccine because I think, like the majority of people, it just felt like it came out really fast, and knowing how vaccines and medicines are, it can take years for them to get approved” (P55, Nurse/Midwife).

Interestingly, some participants, although they had their vaccine, remained sceptical about its long-term effects and efficacy. As one vaccinated participant said,

“I’ve had my first one and my second one’s tomorrow. I mean, I’m really pleased and I’m really grateful to be getting it, but then you watch on the news and they say about ‘Oh there’s these other variants and the vaccine’s not as strong,’ then you start thinking ‘oh no, just when you thought you were seeing light at the end of the tunnel’ ... and you think oh is it going to ever end?” (P63, Ancillary Health Worker).

3.2.3. Passive Decline

The third type of attitude on the continuum is the ‘passive decline’ category, which includes those who have been offered a vaccine or have access to it, but are delaying having the vaccine and remain indecisive if they will take the vaccine or not. Participants have been found to be hesitant because of concerns around fertility, effect on pre-existing health issues, or generally around safety of the vaccines. This group is important because they have not rejected the vaccine outright, and may eventually end up passively accepting it, but there is also the risk that if their concerns and queries are not addressed, they might end up in the ‘active decline’ category. One participant who had access to the vaccine, but had not taken it at the point of interview because of her concerns around potential allergic reactions shared,

“I have allergies...I do worry about having the vaccine when I seem to have all, exacerbated my allergies...I do have concerns...my [family member] has had [adverse reactions] following some previous immunisation...and with my allergies [and health conditions], I am fearful that I might end up having [similar adverse reactions]...and so yeah, so I have got some fears about vaccination” (P76, Nurse/Midwife).

3.2.4. Active Decline

The last subset of participants in our cohort were those who said that they had not taken the vaccine when offered or did not intend to take the vaccine. Although the number of participants declining the vaccine is very low, this category is nevertheless significant because of the influence that they can have as HCWs on the general public. One of these participants, who had declined the vaccine stated,

“I’m not taking vaccine because, you know, the second wave I didn’t got COVID, I’ve got my natural immunisations, so I’m not really fancying the vaccine either” (P40, Allied Health Professional).

While low perception of risk or preference to acquire natural immunity may have influenced participants’ decisions against getting the vaccine, trust in the vaccine or vaccinator may also determine HCWs’ choices. As another participant who had declined the first offer said:

“I was offered [at work]...But I declined...I had concerns it is developed too quick, not proper testing is done or it’s not sufficient” (P16, Ancillary Health Worker).

3.3. Drivers of Vaccine Acceptance

There are several factors that were found to influence acceptance, both active and passive, for the COVID-19 vaccine among HCWs. These include: knowledge of vaccine; risk perception; positive attitude towards other vaccines; social influences; and considerations about the future.

3.3.1. Knowledge of vaccine

Participants who demonstrated familiarity with medical, scientific, or public health information about vaccines were also the ones who were most confident about the COVID-19 vaccine and actively accepted it. Some of these participants had acquired knowledge of vaccinology and virology as part of their professional curriculum or training, which seemed to have boosted their confidence around the COVID-19 vaccine. As shared by a participant:

“When I left university I worked in a medical representative field, so a lot of the clinical trials and so on, so I’m aware about that and with the medical background I have anyway...I haven’t given it a second thought really to be honest” (P60, Allied Health Professional).

Another participant, who was also actively accepting of the COVID-19 vaccine, spoke extensively about the DNA and RNA based vaccine design and technology, which had an influence on his decision to get vaccinated. He said:

“Yes, I was very, very, very optimistic, because A, there was some research, even though it was speedy, but it was necessary at the time, and that was the best that they could come up with. Although it’s an RNA virus, which of course we know the modus operandi of RNA virus as against DNA viruses, the fact that the vaccine can affect an RNA virus is a little bit safer for

humans in my little understanding of virology, than DNA viruses, vaccines, which can then, of course, cause re-combinations with our own DNA. But we don't have DNAs, fortunately. So, if something is able to protect us against an RNA, it's quite, it's less likely to cause mutation in our own DNA and cause us any harm as compared with the vaccine supposedly fighting a DNA virus. So, I'm very optimistic about it" (P53, Doctor).

While some participants may have acquired their knowledge of vaccines during the course of their professional training, for some others, their current role has made them regard the vaccine positively. As one participant, involved in a vaccine trial, replied to the question on willingness to get vaccinated:

"Yes. So I'm currently working on a vaccine trial...and, yes, the vaccine hub's literally about 20 metres that way from me, so absolutely" (P6, Nurse/Midwife).

3.3.2. Risk perception

Participants in our study have also been found to make vaccine decisions based on perceived risks, and those who considered the risk of infection or severe disease to be high were the ones who showed greater acceptance of the vaccine, both actively and passively. Participants displayed risk-averse behaviours, and considered a range of factors in their perception of risk to self, family and even their patients, which in turn influenced their decision to get vaccinated. For example, some participants expressed concern about the risk of exposure in their role but, at the same time considered themselves to be at low risk of getting severely ill if they were infected, so accepted the vaccine to protect themselves as a precautionary measure. As one actively accepting participant shared:

"I suppose myself I think I had sort of, like, few of the risk factors personally... so I don't think that I've ever felt particularly that I was at risk of becoming detrimentally unwell for my own health...[but] the fear of the unknown I suppose and I guess you're putting your own health at risk, you're putting that of anybody that you live with at risk, I was always scared about going to work and catching the virus and then passing it on..." (P8, Doctor).

Another participant, who was worried about the side-effects but decided to get the vaccine to protect herself, said:

"Yes, I think a few people were worried about side effects but I think when we weighed it up, it's better to have the vaccine and a few side effects than not be protected, so everyone who has had it in my family who had been offered it has gone for it" (P54, Ancillary Health Worker).

Another participant who said that she had refused the vaccine the first time, but had it booked and was due to get it soon after the interview, spoke about her decisions:

"Yeah, we were offered it in January. I was a little bit fearful of it so I didn't take up the initial offer but I have booked now...I would like to have another baby at some point and to extend my family and I was just scared that there would have been consequences with that especially with

everything being so new...but I've kind of been keeping an eye on what different bodies were saying and the Royal College of Midwives and Obstetricians and things and Gynaecologists, so everything that I'm reading seems to be positive and saying that they haven't identified a clear risk in any way, so I'm trying to base it all on science as much as I can even though it's an emotive subject! So I've just decided no I need to go ahead. I don't want to have long COVID and I don't want to – if it is going to help me potentially stop spreading it to others I think I have a duty to take it. So I think overall in the bigger picture that's why I decided to go ahead with it” (P74, Allied Health Professional).

Whilst risk to self was an important consideration for many participants, risk to others was often a more significant concern. Participants shared being fearful or worried about infecting their families and loved ones, and even patients, and these concerns led them to accept the COVID-19 vaccine, either actively or passively. As is evident from what one participant said:

“The reason I did it was one, not to protect myself. I've never been scared of anything...But I took the vaccine really to, for my mum really, because I was working in a higher risk environment” (P77, Allied Health Professional).

However, it's important to note that if the risk of disease is deemed to be low, vaccine acceptance may be adversely affected.

3.3.3. Positive attitude towards other vaccines

Confidence in vaccines and appreciation for vaccination in general was an important factor influencing participants' acceptance of the COVID-19 vaccine. Participants who accepted the COVID-19 vaccine, either actively or passively, described themselves as being pro-vaccine, or discussed their uptake of other recommended vaccinations both for themselves and their families. One participant who demonstrated 'active acceptance' said:

“Oh I'm definitely pro-vaccine. So I've always promoted it, because even when I was at work I always took the flu vaccine every year and I always told people, I always made sure I promoted it and always encouraged people to get it. My child is up to date with his immunisation schedule, because I understand the importance of it and I've always believed that prevention is better than cure” (P12, Allied Health Professional).

The association between flu vaccine and the COVID-19 vaccine was made by several other accepting participants, and as one of them described:

“And so I had no concerns, you know, we have the flu vaccination every year, so I kind of viewed it similar to that” (P49, Ancillary Health Worker).

3.3.4. Social influences

Amongst our participants, social influences, or what others in their social group are doing and saying, seemed to have considerable impact on HCWs' decision to get vaccinated. As one participant, who had concerns about the safety of the vaccine but took it after being reassured by his friend, said:

“Well I was a bit worried to start off with, with the Pfizer vaccine because it is a completely new technology. It has been rushed through, never tried, tested and actually you know I got reassured after I spoke to a friend of mine in [Place X] who has actually been involved in developing the vaccine...” (P48, Doctor).

Such lay referrals were resorted to by other participants too and one such participant who was indecisive about taking the vaccine initially, shared how he consulted family and colleagues to get their opinion and reassurance before finally getting the vaccine. In his words:

“I ummed and ahed for a couple of hours, spoke to a couple of colleagues...colleagues who work at the hospital, they said yes, so they've all had it. And I was asking them, 'What do you feel, how do you feel?' 'Just have it, just have it' – and I spoke to my wife at some point, and so I decided ok I'll have the vaccination” (P2, Ancillary Health Worker).

While for some participants, opinion of others in their immediate social network played a part in helping them decide about the vaccine, some other participants influenced their close family and friends to get vaccinated. A nurse, who has family living abroad said:

“I recommended my parents who live in [Place X], my parents in their late 80s, I said to them, 'When the vaccine come in, starting, you go and take your vaccination to protect yourself and others'” (P7, Nurse/Midwife).

Certain participants also made endorsements through social and popular media to influence members of their community to get vaccinated. One such participant, shared:

“I've done a lot of [media] interviews, personally see...just to try and get the message out that to take this Covid-19 seriously... people out in the community who are still taking chances or still not following guidelines who are still resisting the vaccine and listening to the fake news that's going on regarding the vaccine” (P56, Allied Health Professional).

This messaging by HCWs seemed to be influential for some participants who said that watching promotional videos on media or attending Q&A sessions at their workplace have allayed their fears and motivated them to get the vaccine.

As HCWs, there was another kind of social influence which was bearing on our participants, and that is their role as healthcare professionals and the expectation from them not just to be supportive of the vaccine but also to promote it. Interestingly, this expectation from HCWs to be pro-vaccine is not

something which is merely an imposition by the wider community, but a belief which was shared by some of the HCWs themselves:

“I know that even amongst some of my colleagues there is still a reluctance to take the vaccine which sort of beggars belief considering that they are all medical people who I would have thought have understanding of the sciences but well, everyone’s different” (P48, Doctor).

Social influence can be a double-edged sword though, and although facilitative in certain situations, could be disruptive in others.

3.3.5. Considerations about the future

One of the biggest drivers of COVID-19 vaccine uptake among our participants was the belief that the vaccine could be a way out of the pandemic. Participants, although hesitant about the vaccine, were driven to take up vaccination by considerations such as, *“Getting out of lockdown, getting back to normal”* (P49, Ancillary Health Worker) and *“A step forward to freedom to a normal life...”* (P51, Nurse/Midwife). The will to protect oneself for the sake of their family and children was also a consideration for certain participants. As one participant shared:

“So, just weighing it up, I just thought, ‘I’m better off having it, and then, if I do get COVID, it’ll hopefully... I’ll survive it and won’t have any long-term issues or end up six feet under.’ So, that was the biggest motivator, and I just thought, I need to be here for the kids, because they’re not, obviously, old enough to look after themselves” (P55, Nurse/Midwife).

For several other participants, the hope that vaccination would allow them to travel was a significant reason for getting vaccinated. One participant who has family living abroad said:

“I mean, it’s probably going to go on and on but with the vaccine hopefully the impact on people’s lives will not be as much and so then I will be allowed to travel soon to see my parents” (P61, Allied Health Professional).

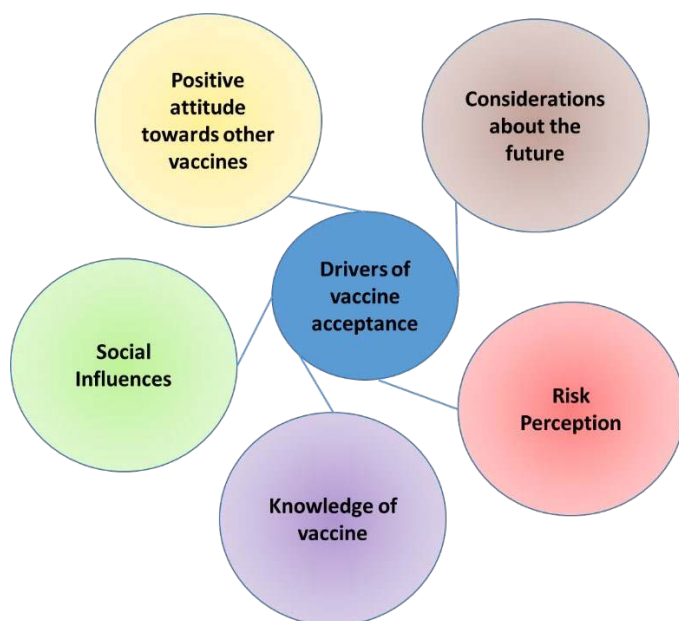


Fig 2: Drivers of vaccine acceptance

3.4. Barriers to Vaccine Acceptance

Along with the forces propelling vaccine uptake, there have also been factors which prevented participants from actively accepting the COVID-19 vaccine, resulting in delay or even denial in certain cases. These inhibiting factors include: trust; information, messaging, and communication; and concerns around delivery and access.

3.4.1. Trust

Trust has been central in shaping participants' attitudes towards the COVID-19 vaccine. Our analysis shows that HCWs weighed trust at two inter-linked levels: trust around the vaccine and historical trust. Lower trust around the vaccine, which at times was reinforced by historical mistrust, had a bearing on participants' attitude towards questioning, delaying, or declining the vaccine when offered. Participants described a key cause of doubt about the vaccine was the pace at which it was developed. One participant said:

"If I'm honest, I was concerned, because of the fact that they'd produced a vaccine so quickly"
(P66, Nurse/Midwife).

Related to the concerns about the expedited vaccine development process, participants also specifically talked about their apprehensions regarding the lack of long-term data to rule out any unknown side-effects on other aspects of health such as fertility. As one participant remarked:

“I did have concerns that it was all done very quickly and all that – and I still believe that a few years down the line we will have some kind of side effects...And then when I was on [duty] actually I came across [x]patients who had the vaccine and had side effects and were admitted to hospital, so that made me feel a little bit...but then again talking to people, it’s just like it doesn’t happen to anyone and I thought, you know, let’s not think too much about it, let’s just get some protection and then whatever is meant to be will be...” (P51, Nurse/Midwife).

Concerns that the vaccine had not been tested for long enough to understand its side-effects on other prevailing health conditions also weighed on the minds of some participants. Talking about it, one participant shared:

“I decided to take it. But obviously I’m very cautious. I was very cautious and very aware about my autoimmune reaction to vaccines, to medication because I do react adversely to types of medication” (P37, Doctor).

Participants also questioned the effectiveness of the vaccine itself, and were wary that it might not be sufficient to see an end to the pandemic. As explained by a participant:

“So, for me, the vaccination is positive; I don’t think it’s the panacea. It’s a Coronavirus, it mutates, we’ve already seen that, they’re calling it a variant – it’s mutated basically – that’s why we’ve not found a cure for the flu, we’ve not found a cure for the common cold – this was going to happen, you know, it was going to happen, so I don’t know, I mean, I don’t know how much propaganda is in this, maybe it is true, maybe the vaccine that they’ve developed will protect us or maybe they’re behind the curve again and they’ve got to redesign the vaccine, I don’t know, so it’s all uncharted waters” (P2, Ancillary Health Worker).

Trust in the vaccine was closely linked to trust in institutions producing or delivering the vaccine such as pharmaceutical companies, the government or even the NHS. Past clinical malpractices or history of discrimination and racism against ethnic minority communities have created distrust of the COVID-19 vaccination campaign. For example, several of our participants spoke about the drug trial carried out by Pfizer in Nigerian children in 1996 without proper ethical clearance (24), and how such instances remain in the collective memory of the community and can make people distrustful of vaccines, particularly the newly developed ones like for COVID-19. Some participants also spoke of historical discrimination and racism and how it has made people from ethnic minority communities question the credibility of the vaccine. As one participant mentioned:

“There has been a lot of mistrust among the community, for example some of the communities will be asking why suddenly is NHS interested in the Black and Asian minority ethnic group? Over years we have spoken, they’ve never listened to us, what has changed now, what is the intention here?” (P59, Doctor).

In the words of another participant:

“I think, especially within the Black community, there’s hesitancy with medical professionals. Because we’re always seen as less than, we always feel less valued, like, your concerns are not taken seriously” (P55, Nurse/Midwife).

3.4.2. Information, messaging and communication

Inadequate and unclear messaging and communication around the COVID-19 vaccine has also been found to have a bearing on HCWs’ hesitancy. The credibility of official information was doubted by some participants, and there are also contradictory messages going around creating panic and confusion. As one participant, who hadn’t had their vaccine said:

“Yes, a lot of, certainly in my family and also within the community, there is a reluctance to take the vaccine. From a family point of view I can probably speak more and I think it is just that uncertainty. It feels like it’s all being pushed out. I feel like Pfizer announced that they’d made the vaccine one day and then suddenly AstraZeneca “Yes we’ve also made the vaccine. We’ll be releasing it” so you just felt like bish, bash, bosh” (P75, Doctor).

Another participant spoke about the need for timely information:

“I think what would have benefitted in my case was having the leaflet, the vaccination leaflet, before I had the vaccine rather than being given that after I’ve had it because it included a lot of information that people could benefit from, that I could have benefitted, and I didn’t have to go fact finding and I wouldn’t have had that doubt if I knew exactly what to expect and how it worked and what it was” (P58, Allied Health Professional).

Another participant who was still looking for credible information on the vaccine, before making up her mind, mentioned:

“We haven’t got that long term data...and that’s a really difficult position obviously because this is something that we need to tackle now and we can’t have access to the information on side effects from ten years’ time. So I would say that’s the main point, and I don’t know how to resolve that” (P38, Doctor).

Participants explained how the decision made in early 2020 to increase the gap between the two vaccine doses caused them anxiety. Most participants described that they were not given a justification about this change, which gave them an impression that the decision was more of “a financial decision and not exactly science” (P47, Ancillary Health Worker) and another “shifting of goalposts” (P8, Doctor) by the government.

Participants also talked about the influence of misinformation or misleading information that gets circulated, and the need to address this in order to support vaccine delivery. In the words of a participant,

“I think the government should be spending a lot more money and getting a lot more out there within the communities and making a big effort to give out the proper information...there’s

communities within communities, and that's who we have to tackle, because this where the, kind of, in the core, the misinformation starts and it just kind of starts spreading, you know, and so we've got to tackle it from the core” (P56, Allied Health Professional).

3.4.3. Concerns around delivery and access

While accessing vaccines was fairly easy for many participants, some encountered challenges in getting a vaccine. One participant, who is a trainee doctor, shared:

“There was a little concern about some of us, who work in locum capacity, because obviously, if you are a locum doctor you are not tied to anyone, so just, you're like a mercenary soldier, you see? You are, so nobody has any direct responsibility for you, unless your GP, and your GP cannot do that” (P53, Doctor).

Some participants also expressed their dissatisfaction with the way delivery of vaccines was prioritised, and questioned why groups such as nurses, ethnic minority staff, and community-based professionals such as podiatrists were not prioritised early on. As one participant remarked:

“And actually what I felt was, which was very wrong and I've expressed it, is that we were doing all these jobs without the vaccine, OK. So people that weren't working in intensive care they've already been vaccinated and I didn't feel that [HCWs] in intensive care were given priority and they should have been given priority for the vaccine” (P51, Nurse/Midwife).

3.5. Mandatory vaccination

When discussing their perceptions about the COVID-19 vaccine, some HCWs raised mandatory vaccination as a key issue. While many participants felt positive about vaccination and recommended it, views around mandatory vaccination for HCWs or even vaccine passports were divided. There were some HCWs who felt strongly that vaccines should be made mandatory for healthcare staff, while others felt that it would impinge on their personal freedom. One participant, who is in favour of mandatory vaccination, remarked:

“I would say unless it's contraindicated everyone needs to have vaccine and make it a rule! As with other vaccines but obviously this is very controversial but I would say no vaccine, no school, no vaccine, you don't enter this building, that kind of thing!” (P61, Allied Health Professional).

Conversely, another participant stressed the importance of free choice and free will while deciding on the vaccine:

“I feel like freedom of choice, what you put in your body is up to you and all the rest of it. We don't enforce MMR and all that stuff. You can't force it down people's throats” (P75, Doctor).

Thinking about the impact that mandatory vaccinations could have on the workforce, another

participant, who herself had been readily accepting of the vaccine, opined:

“I also feel like if you do kind of penalise people for not being vaccinated, disproportionately the people who aren’t being vaccinated are the people who are already kind of maybe more vulnerable in their workplace or in their finances and kind of lose out twice – not being treated well by the government and then lose out from this” (P81, Doctor).

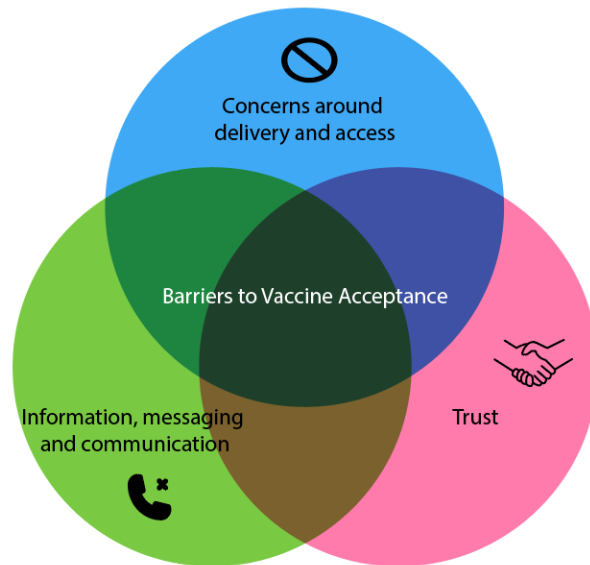


Fig 3: Barriers to vaccine acceptance

4. DISCUSSION

Our study is the first comprehensive qualitative research done with an ethnically diverse sample of HCWs across the UK to explore their experiences of working through the COVID-19 pandemic and attitudes towards vaccination. HCWs are prioritised for receiving the COVID-19 vaccine but there have been disparities in vaccine uptake in this population based on a host of factors. While these disparities have been identified, comprehensive understanding of vaccine attitudes underpinning these variations are yet to be fully explored. In this context, our study brings in-depth understanding of HCWs’ attitudes towards the COVID-19 vaccine, and the factors which are crucial in influencing vaccination decisions.

Our vaccine attitude continuum offers a comprehensive framework to look at the range of COVID-19 vaccine attitudes which HCWs display, and also how these attitudes could change with changing circumstances. In our study, most HCWs reported very positive attitudes towards the COVID-19 vaccine and actively accepted it; a small minority actively declined the vaccine, with the remaining hesitant participants in between. The categories are important, as these show that even people who have received both doses of the vaccine can remain sceptical about the efficacy and need for the vaccine. If this scepticism is not addressed in a timely manner, there are chances that passively accepting

individuals could move towards the declining end of the spectrum, especially now when booster doses have been announced for HCWs in England.

Our findings highlight that vaccine decision making could be a complex process for some HCWs as they consider several factors before deciding to take the vaccine, delay it, or decline to have it. Like other studies (25, 26), perception of risk to self and to others particularly, have been found to significantly influence vaccine decisions among our participants too. Furthermore, the WHO has recognised social influence as an important behavioural consideration, which is likely to influence COVID-19 vaccine acceptance and uptake among people (14). This gives an opportunity to tailor vaccination messages around protecting family and loved ones, which may resonate more with HCWs than the standard expectation that they get vaccinated due to their role as health care professionals. As recommended in previous research, our study also highlights the need for timely and appropriate messaging by the government around vaccination to counter misinformation among HCWs as well as within the wider community (27). Healthcare settings have diverse job roles and promoting vaccine champions from different occupational groups (e.g. porters, domestic and security staff) outside of clinical roles and simplifying technical information could be effective communication strategies for improving vaccine uptake.

Our findings reaffirm that trust is an important factor determining HCWs' attitudes towards the COVID-19 vaccine. In line with previous research (28, 29) we found trust in the vaccine, and concerns around the safety, efficacy, or science behind the vaccine influenced hesitancy. In addition to this, as some of our participants pointed out, the element of trust in institutions of authority, which has been eroded by years of discrimination and racism, could explain the ethnic differences in COVID-19 vaccine uptake as reported by other studies (30, 31). Addressing vaccine hesitancy among ethnic minority HCWs, therefore, has to start with efforts at building trust through empathy, attentive listening and most of all, discarding the pejorative attitude towards these communities. Any policy aimed at addressing vaccine hesitancy among these HCWs must acknowledge the inequalities that are faced by ethnic minorities on a daily basis that are driven by entrenched structural and institutional racism, and racial discrimination (32). This could start with culturally competent approaches coupled with meaningful inclusion and proactive efforts to eradicate systemic racism and structural discrimination to make ethnic minority staff feel valued (33). Without all of these, vaccine promotion strategies may seem enforced, exacerbate power inequities and marginalisation, and increase distrust.

Our study also highlights the contention around mandatory vaccination which is being hotly debated (34, 35). Similar to reports of opposing views on vaccine passports among the general UK public (29), HCWs in our study were also divided in their opinion of making vaccination mandatory for healthcare staff. Whilst increasing vaccination coverage is critical, addressing vaccine hesitancy is complex and

mandating vaccination may be counter-productive, creating or exacerbating mistrust and inequities among HCWs.

Our study has certain limitations. For example, social distancing measures meant that data collection had to be conducted remotely and using online technology. This may have affected participation from certain groups who may be less proficient in use of or have less access to digital technology. Relatedly, study promotion and invitations to join were mostly virtual, which meant that HCWs who do not routinely access virtual communication or use social media may have missed taking part. However, this study had a unique advantage of being able to collect data in real-time as the situation around COVID-19 vaccination has been unfolding in the UK, although the rapid change in scenario could also mean that some of the participants' views may have changed from the time of data collection. Given this, we are making efforts to keep pace with the changes and bring out results rapidly, and some of our early results have already been considered by the government in their policy-making decisions (36).

In conclusion, our study is one of the first to report in-depth qualitative data on attitudes of HCWs towards the COVID-19 vaccine and factors influencing vaccination decisions. While vaccine hesitancy among HCWs has been reported by other studies, our research delineates some of the reasons behind this hesitancy, such as trust and communication. Furthermore, our research strengthens knowledge around the complexity of vaccine hesitancy among this key population of HCWs, and offers a new framework through which the spectrum of vaccine attitudes can be understood. Based on our findings, we recommend that trust-building, inclusive and accessible information, and commitments to proactively addressing structural inequities are going to be crucial in improving vaccine uptake among HCWs.

Table 1: Demographic characteristics of participants

| Variable | Total (N=164) | Sample (n=82) |
|------------------------------|----------------------|----------------------|
| Sex | | |
| Male | 63 | 28 |
| Female | 100 | 53 |
| Other | 01 | 01 |
| Age, median (IQR) | 42 (32-53) | 45 (34.5-53) |
| Ethnicity | | |
| Asian | 65 | 33 |
| Black | 29 | 17 |
| Mixed | 15 | 07 |
| White | 49 | 23 |
| Other | 06 | 02 |
| Job Role | | |
| Doctors | 44 | 17 |
| Nurses & Midwives | 30 | 17 |
| Allied Health Professionals* | 62 | 32 |
| Ancillary Health Workers** | 28 | 16 |
| UK Region | | |
| England | 140 | 70 |
| Scotland | 07 | 03 |
| Wales | 03 | - |
| Northern Ireland | 10 | 05 |
| Unknown | 04 | 04 |

*Also includes dentists, pharmacists, healthcare scientists, ambulance workers and those in optical roles.

** Includes those in administrative, or other non-clinical roles (e.g. housekeeping/security/maintenance etc.)

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Ethical Approval

Ethical approval has been received from the London-Brighton & Sussex Research Ethics Committee of the Health Research Authority (Ref No 20/HRA/4718). All participants gave informed written consent.

Declaration of Interest

MP reports grants from Sanofi, grants and personal fees from Gilead Sciences and personal fees from QIAGEN, outside the submitted work. MG, FW, IQ, AAO, OH, and LBN have no competing interests to declare.

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