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# **Qualitative evaluation of the digital Coaching Health App Implementation Partnership (CHAMP)**

**A novel implementation strategy  
for rolling out digital health tools  
for patients with Chronic  
Obstructive Pulmonary Disease**

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## Assurance rating

*This report can be used for context and background information	
**This report can help inform decision making, when considered with other information	<input checked="" type="checkbox"/>
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Click [here](#) for the project summary report and quantitative analysis.

## Contents

Executive Summary .....	4
Aims: .....	4
Methods: .....	4
Results: .....	4
Conclusion: .....	4
Recommendations:.....	5
Introduction .....	6
Methodology.....	7
Study Design.....	7
Ethical approval.....	7
Participants .....	7
Phase one recruitment .....	7
Phase two recruitment.....	8
Materials.....	8
Procedure.....	9
Analytical procedure.....	9
PPI co-design .....	9
Key Findings.....	10
Phase One .....	10
Phase Two .....	10
1.0 Definition and boundaries of the health champion role.....	10
2.0 The importance of personalised clinical contact.....	11
3.0 Judgements on appropriateness from healthcare professionals .....	12
4.0 A desire for consistency in communication .....	13
Theoretical Domains Framework.....	14
Discussion.....	14
Strengths and limitations .....	16
Conclusion .....	16
Six recommendations from the CHAMP project:.....	16
References .....	17
Appendix 1: Referrer Guide.....	19
Appendix 2: Adapted phase one Table of Changes for PPI.....	20

## Executive Summary

### Aims:

To evaluate the COPD digital Coaching Health App Implementation Partnership (CHAMP) project with focus on the rollout of the myCOPD app in the BNSSG area and the role of health champions in improving implementation and use. Phase 1 aimed to understand health professional and patient barriers and facilitators of engaging with the myCOPD app to improve implementation. Phase 2 aimed to explore stakeholders experience of the digital health champion role in order to create and recommend future implementation resources.

### Methods:

In phase one, 14 semi-structured interviews were conducted with two clinical champions (CCs), two digital health champions (DHCs), five COPD patients, three consultants, one policymaker, and one commercial stakeholder. Questions were asked to elicit information on their experiences of referring and using the myCOPD app. Data were organised into a Table of Changes to identify recommendations to enhance the roll-out and ongoing implementation.

For phase two, nine semi-structured interviews were conducted with two DHCs, three CCs, three COPD patients, and one clinician to understand stakeholders' views on what was needed for sustainable implementation of the myCOPD app and health champions. Data were organised into a Table of Changes and an inductive thematic analysis was employed to analyse the data from phase two.

A co-design approach was taken to synthesise the data with ongoing stakeholder involvement. Data and suggestions for changes to the implementation plan were presented iteratively to a group of CCs, DHCs, patients and the rest of the project team and then refined based on their feedback.

### Results:

In phase one, a 'referrer guide' laying out three quick steps for app referral was created as a solution to address some of the modifiable concerns that arose in the phase one Table of Changes. Alongside this, we provide a set of recommendations for ongoing implementation. In phase two, four themes were developed from the thematic analysis. 1) Definition and boundaries of the digital health champion role. 2) Importance of personalised clinical contact. 3) Judgements on appropriateness of referring the app from healthcare professionals. 4) A desire for consistency in communication. These were subsequently mapped onto the theoretical domain framework where knowledge, social influences, beliefs about capabilities, and environmental context and resources featured most prominently in the successful implementation of the myCOPD app.

### Conclusion:

The data indicates that the use of DHCs and CCs addressed common barriers to patient engagement and uptake of digital tools. Firstly, the one-to-one contact between DHC and patient is beneficial in that it is responsive to patient concerns regarding new technology. Secondly, the ability to provide a demonstration on how to use digital tools facilitates patients' learning. Finally, the action-planning inherent in the act of helping patients choose which myCOPD tiles to focus on and scheduled phone calls increasing engagement. In terms of how DHCs and CCs have experienced the programme, the data highlights that it is important to CCs and DHCs that they are doing the right thing facilitated with consistent guidance that ultimately provides clear benefit to the patients. This combined with the flexibility to make their own judgements and the importance of having one-to-one clinical contact with patients indicates that creating and maintaining those conditions in the CHAMP project is integral for its success.

## Recommendations:

Six recommendations were made for the CHAMP project:

- 1) Introduce a short session for new DHCs and CCs that includes a defined job description, a breakdown of available evidence for myCOPD, and common challenges of adoption and patient engagement.
- 2) Create peer support groups for patients.
- 3) Enable DHCs to have the app at hand when referring patients.
- 4) Create a short guide that accompanies the app to facilitate conversations.
- 5) Provide guidance on phone call follow-ups for DHCs.
- 6) Provide standardised messaging to support consistency between workers and NHS Trusts.

## Introduction

Chronic obstructive pulmonary disease (COPD) is a chronic respiratory condition with a growing prevalence; thus, constituting a public health problem (Safiri et al., 2022). Specifically, Public Health England data indicates emergency COPD admissions in Bristol are in the worst 5% in the UK. Therefore, a preventative intervention is warranted.

Preventative health approaches are predominantly turning towards the self-management approach with digital health tools as an instrument in this. For more context, the UK Department of Health has recommended that apps be “prescribed” as part of patients’ care. Specifically, the myCOPD app is an app designed by clinical experts to support patients in self-managing their condition. It offers a range of functions including remote delivery of pulmonary rehabilitation, education on inhaler technique, symptom monitoring etc. Randomised controlled trials have demonstrated the myCOPD app to show promise for self-management of COPD (NICE, 2022). For example, there is evidence showing an increase in app use to be associated with improvement in COPD symptoms and correct inhaler use (Crooks et al. 2020).

Yet, even with this promising evidence, attention must be paid towards the implementation of digital technology into health systems. Chambers, Cantrell, & Booth (2021) provided a rapid review that highlighted the most frequently reported challenges of implementing digital technology. It includes lack of motivation, distrust of the technology itself, its usability, and the needs and concerns of staff, i.e. their training requirements. They conclude that overcoming these challenges requires active support throughout the implementation process. This includes active engagement with patients, the public, and health care professionals (HCPs). This is especially important given that use of digital tools is predicted to become increasingly relevant for COPD in the coming decades (Haluzsa Saustingl & Halavina, 2020).

Further to this, a large body of research points to an appetite for digital health technologies among HCPs, but clinical engagement is minimal (Leigh, Ashall-Payne & Andrews, 2020). Holtrop (2019) used Bowen’s feasibility parameters to examine a co-pilot for myCOPD and found that many HCPs found the app to be acceptable and feasible to integrate into practice. Nevertheless, research consistently presents certain implementation conditions that it must meet, i.e., fitting with workflow and time being a major factor.

The COPD digital Coaching Health App Implementation Partnership (CHAMP) project, specifically the training and provision of health champions, was designed to address those common implementation barriers by having staff to devote time to support other professionals and patients with the myCOPD app. Health champions are NHS workers and are split into two roles: Role 1) Digital Health Champions (DHCs) who are non-clinical NHS support workers that enrol and coach patients to use the app via receiving referrals, answering queries, and setting goals with the app. Role 2) comprises Clinical Champions (CCs); senior clinical specialist NHS workers employed for four hours per week in the beginning of the project to support the DHCs in their role. The aims of these role was in terms of improving the apps implementation in terms of patient referrals, and uptake and engagement with the app. This encompasses the common drawbacks of digital tool delivery, namely, high attrition and low adherence ([Kohl et al., 2013](#); [Short et al., 2014](#); [Linardon & Fuller-Tyszkiewicz, 2020](#)). Human support is considered a facilitator in digital delivery that is generally desired by app users (Renfrew, Morton, Morton & Przybylko, 2021). Hence, the introduction of DHCs to support patients in starting the app and maintaining use may address this problem.

To assist with addressing these implementation concerns, this service evaluation adopts a person-based approach (Yardley, Morrison, Bradbury & Muller, 2015). This is is method of systematically investigating the beliefs, attitudes, needs and situation of the people who will be using the intervention (Yardley, Ainsworth, Arden-Close & Muller, 2015). This approach helps to ensure that such interventions are acceptable, engaging, and feasible. To carry this

out effectively, this service evaluation engages in iterative qualitative research and stakeholder consultation throughout the entire process. The person-based approach has been utilised to provide recommendations on how to ensure that implementation is as effective as possible.

Therefore, the aim of this project is to evaluate a novel implementation strategy in the form of employing health champions to engage and enrol patients to use the myCOPD app. The objectives for the current service evaluation were:

- 1) To identify perceived barriers and facilitators to adoption and engagement with the myCOPD app.
- 2) To evaluate the experience of having the digital health champion and clinical champion roles.

## Methodology

### Study Design

In collaboration with the West of England Academic Health Science Network, an interview study across the implementation period was conducted to capture the ongoing implementation of the CHAMP project. Phase one involved interviewing a wide range of stakeholders including healthcare professionals, patients, policymakers, commercial partners etc. This was to gather a wide range of perspectives to identify perceived barriers and facilitators to implementation and engagement of the myCOPD app across pathways. In phase two, those directly involved in the CHAMP project were interviewed including health professionals who took part in phase one to evaluate the experience of having the health champion roles.

### Ethical approval

Ethical approval for this study was received from the University of Bath Psychology Department Ethics Committee on the 15/12/2021. Ethics number: 21-285. Informed consent was obtained from participants through a signed consent form prior to being interviewed. No deception was involved as participants were given complete information on the service evaluation aims and objectives and were assured of their right to withdraw their data up until two weeks post-interview. In terms of data confidentiality, this study adhered to the General Data Protection Regulation (2018). Details are included in the procedure.

### Participants

Participant recruitment took place over two phases of implementation of the COPD CHAMP project with three months between each phase.

All participants were recruited by a combination of purposeful and opportunity sampling (Etikan, 2016) given that the participants recruited were a combination of patients, health champions and other health professionals that work in the clinical service. Professional participants were recruited via an email list of professional connections of researchers on the team. Patients were recruited via an encrypted email consisting of the names and contact details of those patients who agreed to be contacted for research purposes. This method was chosen for the benefits of convenient proximity and accessibility as participants were selected via professional connections of the research team and overarching steering group. This also required participants to have heard of myCOPD and/or have used it.

### Phase one recruitment

In phase one, a total of 19 people were contacted, and 14 participants (aged over 18 years old) responded and consented to take part in the study between January and March 2022. Two participants were currently working as a CC as part of their healthcare role in the NHS. Two participants were currently working as a DHC as part of their healthcare role in the NHS. Five participants were patients receiving care from DHCs. Three participants worked as consultants. One participant was a policymaker, and finally, one participant was a commercial



stakeholder (see Table 1). All participants were based in the Northwest localities of BNSSG (north and west Bristol and South Gloucestershire), central, south and east Bristol, and the Weston area from NBT, and Sirona Healthcare.

#### Phase two recruitment

In phase two, a total of 11 people were contacted, including those patients, DHCs, and CCs that took part in phase one. Nine people responded (aged over 18 years old) and consented to take part in the study through July to September 2022. Seven of these participants had taken part in phase one. A total of nine semi-structured interviews were conducted with two DHCs, three CCs, three COPD patients, and a clinician involved in the CHAMP project (see Table 1). In terms of recruitment, participants were approached because of their direct involvement in the CHAMP project along with patients who were receiving support from the COPD Digital Champion service.

**Table 1:** *Number and type of participants in phase one and phase two*

Phase one	Role	Phase two
2	Digital Health champions	2
2	Clinical champions	3
5	Patients receiving respiratory care	3
3	Clinicians in respiratory care	1
1	Policy maker	0
1	Commercial stakeholder	0
Total=14		Total=9

#### Materials

**Interview guide for phase one:** Participants were asked 12 questions to elicit data on their thoughts, feelings, and experiences of the myCOPD app in order to fulfil objective one: To identify perceived barriers and facilitators to adoption and engagement with the myCOPD app. This included data on their knowledge, attitudes, behaviours, and macro-level influences on the roll-out of the app. Questions were adapted between patients and professionals. For example, when asking a professional participant, ‘what do you need to confidently refer the myCOPD app?’, the question would be adapted for a patient by rewording it to ‘what do you need to feel confident about the myCOPD app?’

**Interview guide for phase two:** Participants were asked 12 questions to elicit data on their experiences of the CHAMP project. This was designed to help address objective two: To evaluate the experience of having the digital health champion and clinical champion roles. This included data on their knowledge, attitudes, behaviours, and macro-level influences on their role with focus on use of digital tools as this is a substantial element of their role. Questions were designed to capture the 14 domains of the theoretical domains framework (Atkins et al., 2017) to structure the analytical process and guide the adaptation of implementation strategies. Again, questions were adapted between patients and professionals. For example, a health champion was asked, ‘in what ways has patient engagement with the myCOPD app been impacted by health champions?’ and this was adapted to patients by rewording to ‘in what ways have health champions affected your use of the myCOPD app?’



## Procedure

Informed consent was received from each participant once they had received the participant information sheet and had an opportunity to ask questions about the service evaluation. Before enrolment in the service evaluation, participants provided their informed consent by signing a box in the consent form indicating that they agreed that they had read and understood the information provided. This was provided prior to the interview to give participants more information about the service evaluation and its objectives. They were also informed that they could withdraw from the service evaluation without giving a reason.

Once consent was given, each participant took part in a 30–45-minute semi-structured interview over a video conferencing software, Microsoft Teams. Subsequently, interviews were stored on the university X-drive for security, anonymised by assigning numbers to participants, removing any other identifiable information such as other names and places, and transcribed cleanly. This process was repeated twice: once for phase one and once again for phase two.

Sample size was affirmed with consideration of information power (Malterud, Siersma, & Guassora, 2016). The aim of the service evaluation was narrow, the sample has specific characteristics, includes a theoretical perspective, and focused dialogue. Given the high level of information the sample holds, the respective sample sizes of 14 and nine participants were deemed acceptable.

## Analytical procedure

Data from phase one and two interviews were recorded, pseudo-anonymised by assigning numbers and transcribed cleanly. The data were then organised into a Table of Changes using the person-based approach (Bradbury et al., 2018); an anonymous spreadsheet specifically for updating digital resources using stakeholder feedback. Comments were categorised as positive, negative, neutral, suggested change, reason for change, priority, and agreed change. This process was repeated for each data phase.

Phase two data from the Table of Changes were thematically analysed inductively initially and then deductively mapped onto the theoretical domains framework (TDF) (Atkins et al. 2017) to provide a comprehensive and generalizable analysis of all the potentially relevant domains to target in programme implementation. This will help guide the recommendations made. The coding manual included frequency of comments, key summary, and illustrative quote.

## PPI co-design

In phase one, data on suggested changes were subsequently presented to the project team consisting of DHCs, CCs, patients, and other members of the project team for their feedback. As a result, a 'referrer guide' was co-created along with a set of recommendations to increase patient engagement with the MyCOPD app.

In line with the person-based approach, two groups were consulted on their experiences of the CHAMP project and the referrer guide that was produced after phase one of interviews: One for DHCs with a total of three attendees and one for CCs with a total of five attendees. All attendees were asked questions specifically about their experiences of the programme. They were asked questions relating to expectations, perceived benefit, any issues that have experienced etc. Output from these discussions was used to support data elicited from the interviews as part of the final themes after data from the interviews was coded. Subsequently, feedback was received regarding a 'referrer guide' based on output from earlier interviews and this was adapted accordingly.

## Key Findings

Findings from each phase are reported in turn below.

### Phase One

In phase one, key points that arose from the table of changes in terms of barriers to using the app (see Appendix B for more detail and supporting data) were as follows. Caution was expressed by patients in terms of data privacy and who had access to this data. Patients were not always clear why they were being asked mental health questions and how this related to self-managing their COPD. Patients also mentioned uncertainty around how to use the app and whether they were 'using it right' as impacting their engagement with the app. Similarly, HCPs, CCs, and DHCs expressed wanting more information on what they are referring to in order to increase their confidence in the app. Most of the health professional participants expected older patients to be less suitable for the app. This is at odds with research suggesting that older individuals are increasingly accessing digitally enabled services (Burch, Preston, Bateup and Hina, 2017). HCPs also had concerns about patients' viewing the app as a replacement for their care, and time concerns in terms of embedding myCOPD referral into practice. Healthcare professionals expressed the importance of having the app at hand to show patients, preferably in person, to facilitate engagement, with a personalised approach given the huge variability in COPD patients' clinical needs.

Potential solutions were presented to the project team, i.e., West of England Academic Health Science Network and those involved in the CHAMP project. Subsequently, solutions were refined with their feedback (see appendix B). The referrer guide was co-developed in response to the output from the phase one Table of Changes and feedback. It lays out three quick steps designed to make myCOPD app referral as useful as possible in the short amount of time that a patient and the digital health champion has together. It frames myCOPD as a tool to complement care; not a replacement, it introduces tile-selection to offset the overwhelm that new technology can bring, and finally, it includes a QR code to the myCOPD app so referrers can see and understand what they are referring as well as offering the ability to demonstrate the app for the patient.

Finally, further feedback was given by DHCs and CCs via email and focus groups to refine the referrer guide. This was prompted by questions designed to elicit their thoughts on the guide and how they would use it in practice. The final referrer guide to improve patient referral and engagement can be seen in Appendix A.

### Phase Two

In phase two, a thematic analysis of all nine participant interviews was conducted via an inductive approach. This elicited several common themes in relation to their experiences of the CHAMP project.

Four overarching themes were developed as follows: 1. Definition and boundaries of the health champion role 2. Importance of personalised clinical contact 3. Judgements on appropriateness from healthcare professionals 4. A desire for consistency in communication. Illustrative quotes are presented with each theme. These themes were then analysed deductively with reference to the Theoretical Domains Framework.

#### 1.0 Definition and boundaries of the health champion role

Many CCs and DHCs reflected on what their role means and how it fits in with the wider socio-cultural climate. For example, there was an optimism in the future of digital health tools and, thus, the relevance of CCs and DHCs in helping patients use the technology. *"I've always been quite supportive of it because it's just the way the world is moving. Everything's technology these days"* (Participant 5). Hence, the perceived value of the role was clear but there were comments on a lack of guidance on how to conduct the role.

*“I would recommend that for anyone else coming into it they go and spend a couple of days, maybe with two different, you know from different areas, ‘cause everyone might do it slightly differently” (Participant 9)*

This links in with the PPI feedback sessions where a lack of defined job description had impacts on how CCs and DHCs carry out their roles, *“I had to find out a lot of stuff by myself”* (Participant 4). Those who joined the CHAMP project later in the implementation expressed difficulties from not being involved from the start: *“It was quite difficult coming into it later ...it was quite hard to pick up”* Participant 9

The concept of role boundaries was heavily discussed in the PPI sessions. For example, CCs expressed four hours a week to get myCOPD set up was not enough and often bled into their main role, making it hard to retain separation. This aligns with the experience of DHCs who shared in the PPI sessions that patients often do not view them as DHCs and often instead treat them as practice nurses.

**Recommendations:** Offer a more defined description of the CC and DHC roles and enable sharing of information. Include focus on how to present the DHC role to patients.

## 2.0 The importance of personalised clinical contact

There were multiple patient comments expressing that having a conversation helped them in terms of navigating the relevant tiles of the myCOPD app.

*“I always find that if you speak to somebody it goes in better than just looking at a screen”*  
(Participant 1, patient)

Following on from the importance of conversation, both patients and DHCs commented on the benefits of demonstrating how myCOPD works in person. This was made with reference for ease of communication particularly with older patients who might be hard of hearing, and the benefit of aiding memory. For example, DHCs expressed that identifying suitable tiles was a key part of their conversations with patients. This was suggested with the benefit of reducing the sense of overwhelm that can come from trying new technology.

*“I think there is so much information on there which it could get overwhelming. So it's good to be able to break it down to the different tiles and just focus on a little bit at a time”*  
(Participant 9)

To help health champions enhance this clinical contact, participants in both the interviews and PPI sessions suggested a short introductory session or webinar to help familiarise them with the app at the beginning of joining the CHAMP project. This arises from the view that it is hard to refer something to a patient when you do not know exactly what you are referring.

*“It's hard to explain something that you don't actually know about very much yourself”*  
(Participant 7).

*“I think if we could host a sort of short webinar [when training health champions] and really to say this is the myCOPD app, this is how it works, this is what the patient sees”*  
(Participant 8)

Follow-up phone calls were mentioned as being useful for engaging patients and providing them with small goals to get them started on the app. Both patients and DHCs commented on the benefits for the patient in knowing somebody is going to be contacting them later in terms of accountability. It was also suggested to provide another check-in for the already engaged

patients to ensure they do not feel “dropped”; thereby, exemplifying the importance of social support in the CHAMP project.

*“And I think because they know that I'm gonna give him a ring in a week's time or two weeks' time, whatever. They're ohh I'd best get on and do my app then”* (Participant 7)

Further to this, peer support was suggested by participants as a way of enabling patients to share information about the app in groups and to increase motivation to try it. This is supported by anecdotes of peer support being successful in practise.

*“There is some people who wouldn't [use the app], and then once they heard from someone else. I mean, if you tell me something and then you said, well, I've been doing it and blah blah and it works and ohh, I'd love a go then.”* (Participant 2, patient)

**Recommendations:** Create peer support groups to enable patients to support each other and consider training patients as DHCs as an additional implementation strategy. Enable DHCs opportunities to have the app at hand to show patients and provide a short guide that accompanies the app to facilitate conversations and patient memory. Develop a webinar or in-person session for new CCs and DHCs to show them how to use the myCOPD app.

### 3.0 Judgements on appropriateness from healthcare professionals

DHCs and CCs were acutely aware that much of their patient population are elderly and might require specific support. This is also with the view that their patients are individuals with varying needs. As one DHC stated, *“sometimes you sort of have a 99-year-old and they're fine [with the app]”* (Participant 7). To aid this, DHCs expressed that they use their own judgement to assess patients' capability of using digital tools. For instance, if a patient does not use a smartphone or is further down the line in their disease progression, many participants stated that they would not recommend the app to avoid causing the patient undue stress.

*“It's more about our patient cohort, they are older, but they're also further down the line in their disease process. So actually either the app's not appropriate or like I said, they're not capable of using it”* (Participant 6)

On the other hand, some patients acknowledged their age being a barrier but as a way of needing extra support rather than being unsuitable for the app.

*“But it is the older generation and to educate them to use an app, the only reason I can do this is because I've got grandchildren and they explain this”* (Participant 1, patient)

On this note, comments pointed towards an individualised approach being beneficial considering the variable responses and levels of engagement from patients. A particular example concerned the more technical aspects of using myCOPD, i.e., inputting medication and the role that DHCs have in supporting this.

*“Whenever they go I couldn't put my inhalers in so I quite often do it on their behalf, but if I wasn't doing that, they'd probably given up”* (Participant 7)

DHCs and CCs also described using their own judgement in how they market digital health tools. Multiple CCs indicated that they have not seen the impact of the myCOPD app in terms of reducing hospital admissions or exacerbations and prefer not to use that evidence when describing the app. Multiple participants have expressed that it is helpful to market digital health tools like myCOPD as an information resource rather than echoing the data that they have not observed first-hand.

*"I haven't seen how it's impacted like hospital admissions and things but I can see how someone can get enjoyment out of it and learning out of it"* (Participant 4)

As well as *how* they discuss the app, there were mixed opinions as to *what* time-points and contexts are suitable for referring patients to digital tools. i.e., some participants suggested it might not be appropriate for those in in-patient care due to their ill-health with an app being *"the least of their priorities"* (Participant 4). Other participants offer it to everyone *"although we offer it to everyone, you know some once they get home will say no"* (Participant 9). In all, much of *how* and *when* they approach patients is guided by their personal judgement on whether it would be of use to their patients.

*"I think we are quite experienced with knowing the patients who will benefit from it although we offer it to everyone"* (Participant 9)

*"I think whilst it's great to introduce in the hospitals part of the bundle again that person might not be ready to receive it because they've been so unwell. You have to pick the right patient"* (Participant 6)

*"It's not maybe the right time for them when they're having their oxygen reviewed and things because they've got a lot of things going on"* (Participant 7)

**Recommendations:** With an introductory session, provide some discussion on approaching older adults with guidelines on who will be eligible or not eligible for the app. Technical support for patients. Training health champions on the evidence base of the app when joining the service.

#### 4.0 A desire for consistency in communication

Sharing learning between NHS trusts and GP practices has been highlighted as beneficial to save time for CCs. It was stated in conjunction with the need for consistency in patient communication between health champions. This includes the suggestion of some standardised messaging that DHCs can use between phone calls, as this element of the role is said to take up a lot of their time, *"we're quite busy. Lots of phone calls to make."* (Participant 7).

*"We need some way of making sure we're all doing things roughly the same within our remits and within our organization"* (Participant 9)

*"I think if there's any external resource that can be put in place to actually go in and get patients set-up on myCOPD would be useful. I think that was a huge barrier for digital health champion is actually released from clinical time because the demand is so high"* (Participant 8)

Many participants expressed difficulties in balancing clinical time with outreach work so any efforts to reduce time spent calling patients would be useful. For example, a template or a list of useful phrases they could use to email a patient who has not answered the phone a certain number of times. Aids to facilitate referral were a feature in the interviews both to benefit patients and keep DHCs' practise consistent. It is evident that although DHCs value the individualised approach from theme 3, standardised messaging between phone calls would provide some balance in enabling them to use their own judgement but also be consistent and save some time where they can. For example, on the suggestion of a patient guide to facilitate learning of the app, one DHC stated:

*"It would be beneficial that we'd all be saying the same sort of thing as well so everyone's having the same service delivery"* (Participant 7)



*“If I wanted to explore a little bit more on the different tiles within the app then a little memo pad or, you know, sort of something written down in short term. I mean we don't want a war and peace book written over, but certainly something small that you can refer to”*  
(Participant 3, patient)

On those lines, A DHC suggested that the provision of leaflets to give patients more information about the app would be useful. *“I think the only thing that would be quite beneficial is that is a leaflet to hand out to patients. There is a leaflet, but it doesn't have a lot of information about the app on it”* (Participant 7)

**Recommendations:** Set expectations on phone call follow-ups and introduce guidance on how many phone calls are appropriate and how much is "overboard". Complement this with standardised messaging that is as consistent as possible between trusts but still enables tailoring. Adapt current leaflet to explain the app and the different tiles involved.

## Theoretical Domains Framework

After themes were developed from the data, they were mapped onto the theoretical domains framework (TDF) as a way of providing a systematic, comprehensive, and theory-derived process to identify target behaviours for change (Phillips et al., 2015).

The domains that featured most prominently are *knowledge*, *social influences*, *beliefs about capabilities*, and *environmental context and resources*.

The *knowledge* and *social influences* domains converge on the importance of having a conversation about the app. Specifically in terms of facilitating patient learning of how to use the app and having it explained by another person. This is encapsulated by the added element of increasing motivation for the patient in terms of knowing they will get a phone call at a date in the future. As well as increasing motivation, *knowledge* is also linked to the *memory* domain as there were comments on doing this in a way that does not overload patients with information that they might forget later.

On these lines, the *beliefs about capabilities* domain was discussed frequently with reference to whether the patient is capable or using the app and/or whether it would be beneficial to them. Multiple participants expressed that judgements on capability are the deciding factor on whether to open a conversation about digital health tools in the first place. Beliefs about the capabilities of the myCOPD app also featured in the context of how beneficial it is perceived to be for patients. This is evident in the data given that multiple participants stated they that they prefer to communicate the self-management aspect of the app rather than stating its other claims relating to reducing hospital admissions. This is an example of tailoring communication to suit the patient which further compounds the *social influences* domain with consideration of the perceived capabilities of both the patients and the digital tool itself.

The *environmental context and resources* domain also featured prominently. The data was imbued with comments around saving time with focus on reducing overwhelm for new DHCs and CCs. Some practical suggestions were put forward. For example, the introduction of a short webinar at the beginning, sharing more learning between trusts, and some standardised messaging that DHCs can access. These practical suggestions will serve to ease the process of becoming a CC or DHC and remove some of the obstacles that interfere with their daily duties.

## Discussion

This service evaluation aimed to explore the facilitators and barriers to the CHAMP project interpreted with reference to TDF domains. The targeting of domains provides a practical

approach in ensuring any implementation plans are theory informed. In this case, there were four domains that featured prominently in the data. These are: *knowledge, social influences, beliefs about capabilities, and environmental context and resources*. They contain potentially modifiable influences of behaviour that have been influential in the CHAMP project. Given this, they will be examined below and discussed in the context of existing research.

The CHAMP project has a strong emphasis on one-to-one contact between DHC and patient. It aligns with this data which points heavily to the importance of social contact in disseminating information. Existing literature on digital health tools highlights the issue of users not knowing which app to choose along with credibility and privacy concerns regarding their data (Peng, Kanthawala, Yuan and Hussain, 2016). This is especially pertinent given that Leigh, Ashall-Payne and Andrews (2020) argue that supporting the dissemination of evidence-based technologies are critical for the NHS to achieve its long-term digital transformation ambitions.

To aid this goal, one must take account of the evidence suggesting health champions' perceived capability of both the digital tool and the patient. This, and the flexibility of using their own judgement on when and how they refer the app compounds the importance of social contact. Nevertheless, this service evaluation examines the importance behind the reasons why a healthcare professional might or might not refer the app to a patient. As such, this warrants action to ensure referring professionals are considering any potential biases. Consequently, one of the recommendations put forward is to include the concept of "patient eligibility" in an introductory session for new CCs and DHCs and improving the consistency of communication about the app across health champions.

The social contact element of the CHAMP project is well-supported by both the data and existing literature. Additionally, the introduction of peer-support groups would add another dimension in allowing patients another avenue of obtaining digital support. This could be especially useful for DHCs in terms of saving time but also reducing that sense that they are "dropping" patients after the final phone call.

Specifically with COPD patients, self-management interventions that include an action plan have shown positive outcomes on quality of life and hospital admissions (Lenferink, Brusse-Keizer, van der Valk, 2017). This links in with the frequent comments on helping patients choose specific tiles from the myCOPD app. This combined with the plan for scheduled phone calls, appears to lend itself well to a plan of action for both the patient and DHC.

One issue to take note of is that a substantial proportion of patients do not respond to self-management interventions (Jonkman, Westland, Trappenburg, 2016). Korpershoek (2021) argues that this might be explained by the 'one size fits all' and argues that individualised strategies are needed. These are prominent in the personalised nature of conversations between DHC and patient. To expand on this point, much of the literature highlights the specific needs of older adults and their use of technology. Ahmad et al. (2022) argues that it is imperative that older adults are given a thorough demonstration on how to use digital tools so they can gain sufficient knowledge on how to use them. Given that DHCs and CCs consistently acknowledged they are working with an older population, it lends support to the CHAMP project in its flexible approach.

The points made above align well with self-determination theory (Ryan & Deci, 2000) (SDT). SDT outlines three necessary conditions that must be met for behaviour to occur. These are: 1) competence; feeling efficacious and having a sense of accomplishment. 2) autonomy; feeling in control of one's own behaviour, and 3) relatedness; inherent in social contact.

The feeling of competence is relevant to the points made about *perceived capability* but also that need for consistency evident in the *environmental context and resources domain*. This is also relevant for our recommendations calling for a more defined job description as it is likely that this will provide a frame of reference that enables new CCs and DHCs to feel affirmed in



their role. The same applied to expectations on phone call follow-ups and provision of standardised messaging. The sense of autonomy is existent in their flexibility to make their own judgements on appropriateness which can be reflected on as prompted by a short introductory session. Additionally, direct experience of the app is merited to increase DHCs' sense of autonomy and competence in referring it to patients. Finally, much of a sense of relatedness is imbued in that consistency between trusts, having a defined role, and knowing clearly where they sit in the system.

### Strengths and limitations

All interviews were performed by the same researcher following an interview guide; thus, giving rise to consistency in data collection. In terms of credibility, patients were encouraged to reflect on the questions from a variety of positive and negative aspects. This was an effort to help reduce bias. Nevertheless, it is important to note that self-selection bias may still have come into play. For example, participants with stronger opinions of the subject may well be more likely to respond to the invite and participate in the evaluation. Additionally we did not explore the experiences of patients who declined the app when referred to understand the barriers and facilitators of uptake in this group.

### Conclusion

The use of DHCs and CCs address common barriers to patient engagement and uptake of digital tools. Firstly, the one-to-one contact between DHC and patient is beneficial in that it is responsive to patient concerns regarding new technology. Secondly, the ability to provide a demonstration on how to use digital tools. Finally, the action-planning inherent in the act of helping patients choose which myCOPD tiles to focus on and scheduled phone calls. In terms of how DHCs and CCs have experienced the programme, the data highlights that it is important to CCs and DHCs that they are doing the right thing facilitated with consistent guidance that ultimately provides clear benefit to the patients. This combined with the flexibility to make their own judgements and the importance of having that one-to-one clinical contact with patients indicates that creating and maintaining those conditions in the CHAMP project is integral for its success.

### Six recommendations from the CHAMP project:

1. Introduce a short session for new DHCs and CCs that includes a defined job description, a breakdown of available evidence for myCOPD, and common challenges of adoption and patient engagement.
2. Create peer support groups for patients.
3. Enable DHCs to have the app at hand when referring patients.
4. Create a short guide that accompanies the app to facilitate conversations.
5. Provide guidance on phone call follow-ups for DHCs.
6. Provide standardised messaging to support consistency between workers and trusts.

## References

Author(s). (Year of publication). Title of article. *Title of journal*, Volume number(Issue), Page numbers.

Ahmad, N., Mat Ludin, A., Shahar, S., Mohd Noah, S., & Mohd Tohit, N., 2022. Willingness, perceived barriers and motivators in adopting mobile applications for health-related interventions among older adults: a scoping review. *BMJ Open*, 12(3), 054561

Atkins, L., Francis, J., Islam, R., O'Connor, D., Patey, A., Ivers, N., Foy, R., Duncan, E. M., Colquhoun, H., Grimshaw, J. M., Lawton, R., & Michie, S. (2017). A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems. *Implementation Science*, 12(1). <https://doi.org/10.1186/s13012-017-0605-9>

Atkins, L., Francis, J., Islam, R., O'Connor, D., Patey, A., Ivers, N., Foy, R., Duncan, E. M., Colquhoun, H., Grimshaw, J. M., Lawton, R., & Michie, S. (2017). A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems. *Implementation Science*, 12(1). <https://doi.org/10.1186/s13012-017-0605-9>

Etikan, I. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1. <https://doi.org/10.11648/j.ajtas.20160501.11>

Gordon, W., Landman, A., Zhang, H. and Bates, D., 2020. Beyond validation: getting health apps into clinical practice. *npj Digital Medicine*, 3(1).

Haluza, D., Saustingl, M., & Halavina, K. (2020). Perceptions of Practitioners on Telehealth and App Use for Smoking Cessation and COPD Care—An Exploratory Study. *Medicina*, 56(12), 698. doi: 10.3390/medicina56120698

Holtrop, T., Vervoort, S. C., Schoonhoven, L., Schuurmans, M. J., & Trappenburg, J. C. (2020). Early-Stage Feasibility of a Mobile Health Intervention (Copilot) to Enhance Exacerbation-Related Self-Management in Patients With Chronic Obstructive Pulmonary Disease: Multimethods Approach (Preprint). *JMIR Formative Research*.

Jonkman, N., Westland, H., Trappenburg, J. C., Groenwold, R. H., Bischoff, E. W., Bourbeau, J., Bucknall, C. E., Coultas, D., Effing, T. W., Epton, M., Gallefoss, F., Garcia-Aymerich, J., Lloyd, S. M., Monnikhof, E. M., Nguyen, H. Q., van der Palen, J., Rice, K. L., Sedeno, M., Taylor, S. J., . . . Schuurmans, M. J. (2016). Do self-management interventions in COPD patients work and which patients benefit most? An individual patient data meta-analysis. *International Journal of Chronic Obstructive Pulmonary Disease*, Volume 11, 2063–2074. <https://doi.org/10.2147/copd.s107884>

Kohl, L. F., Crutzen, R., and de Vries, N. K. (2013). Online prevention aimed at lifestyle behaviors: a systematic review of reviews. *J. Med. Internet Res.* 15:2665. doi: 10.2196/jmir.2665

Korpershoek, Y. (2021). Self-management support using mHealth in patients with COPD From promise to proof (PhD candidate). University of Applied Sciences Utrecht.

Leigh, S., Ashall-Payne, L. and Andrews, T., 2020. Barriers and Facilitators to the Adoption of Mobile Health Among Health Care Professionals From the United Kingdom: Discrete Choice Experiment. *JMIR mHealth and uHealth*, 8(7), p.e17704.

[Leigh, S., Ashall-Payne, L., & Andrews, T. \(2020\). Barriers and Facilitators to the Adoption of Mobile Health Among Health Care Professionals From the United Kingdom: Discrete Choice Experiment. \*JMIR MHealth and UHealth\*, 8\(7\), e17704. <https://doi.org/10.2196/17704>](#)

Lenferink, A., Brusse-Keizer, M., van der Valk, P. D., Frith, P. A., Zwerink, M., Monninkhof, E. M., van der Palen, J., & Effing, T. W. (2017). Self-management interventions including action plans for exacerbations versus usual care in patients with chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews*, 2017(8). <https://doi.org/10.1002/14651858.cd011682.pub2>

Linardon, J., and Fuller-Tyszkiewicz, M. (2020). Attrition and adherence in smartphone-delivered interventions for mental health problems: a systematic and meta-analytic review. *J. Consult. Clinic. Psychol.* 88:1.

Mayer, M., Rodríguez Blanco, O. and Torrejon, A., 2019. Use of Health Apps by Nurses for Professional Purposes: Web-Based Survey Study. *JMIR mHealth and uHealth*, 7(11), p.e15195.

Palinkas, L. A., Mendon, S. J., & Hamilton, A. B. (2019). Innovations in Mixed Methods Evaluations. *Annual Review of Public Health*, 40(1), 423–442. <https://doi.org/10.1146/annurev-publhealth-040218-044215>

Peng, W., Kanthawala, S., Yuan, S. and Hussain, S., 2016. A qualitative study of user perceptions of mobile health apps. *BMC Public Health*, 16(1).

[Phillips, C. J., Marshall, A., Chaves, N., Jankelowitz, S. K., Lin, I. J. B., Loy, C. T., Rees, G., Sakzewski, L., Thomas, S., To, T., Wilkinson, S. A., & Michie, S. \(2015\). Experiences of using the Theoretical Domains Framework across diverse clinical environments: a qualitative study. \*Journal of Multidisciplinary Healthcare\*, 139. <https://doi.org/10.2147/jmdh.s78458>](#)

Qudah, B., & Luetsch, K. (2019). The influence of mobile health applications on patient - healthcare provider relationships: A systematic, narrative review. *Patient Education and Counseling*, 102(6), 1080-1089. doi:10.1016/j.pec.2019.01.021

Ryan, R. M., & Deci, E. L. (2000d). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066x.55.1.68>

Safiri, S., Carson-Chahhoud, K., Noori, M., Nejadghaderi, S. A., Sullman, M. J. M., Ahmadian Heris, J., Ansarin, K., Mansournia, M. A., Collins, G. S., Kolahi, A. A., & Kaufman, J. S. (2022). Burden of chronic obstructive pulmonary disease and its attributable risk factors in 204 countries and territories, 1990-2019: results from the Global Burden of Disease Study 2019. *BMJ*, e069679. <https://doi.org/10.1136/bmj-2021-069679>

Shaw, G., Whelan, M., Armitage, L., Roberts, N., & Farmer, A. (2020). Are COPD self-management mobile applications effective? A systematic review and meta-analysis. *Npj Primary Care Respiratory Medicine*, 30(1). <https://doi.org/10.1038/s41533-020-0167-1>

Short, C. E., Vandelanotte, C., Dixon, M. W., Rosenkranz, R., Caperchione, C., Hooker, C., et al. (2014). Examining participant engagement in an information technology-based physical activity and nutrition intervention for men: the manup randomized controlled trial. *JMIR Res. Protoc.* 3:2776. doi: 10.2196/resprot.2776

[Yardley L, Morrison L, Bradbury K, Muller I. The person-based approach to intervention development: application to digital health-related behavior change interventions. \*J Med Internet Res\*. 2015;17\(1\):e30. doi: 10.2196/jmir.4055.](#)

# A quick guide for referring the myCOPD app

A team of researchers from the University of Bath and the West of England Academic Health Science Network have worked with patients and healthcare professionals to develop these guidelines. The purpose is to make myCOPD app referral as useful as possible in the short amount of time that a patient and the referrer has together.

### 3 key steps to help patients benefit from myCOPD

#### 1) Emphasise that the app is an enhancement to patient care; not a replacement

Some patients and healthcare professionals are concerned that the app acts as a replacement for patients' existing care. So, it would be useful to discuss with the patient how it can add to the care they are already receiving. Also, whilst myCOPD is not suitable for everyone, it can be helpful for any age. We're still learning about who it suits most but we can say the average age of myCOPD users is 74.

#### 2) Focus on a specific part of the app

To help the patient understand how myCOPD can help them, collaborate on choosing a tile to make a specific goal. The choice of tile will be dependent on the referrer and patient's individual needs. To explore this, try asking them what area of their COPD they would like to know more about. This will help simplify the process as the various tiles can be overwhelming.

#### 3) Have the app at hand to show the patient

Healthcare professionals report finding referral beneficial when they have something tangible to look at. At this point, you can discuss which tiles the patient are likely to benefit from. Check out the QR code below so you can show them what the app looks like.



You can refer to the FAQ if patients have further questions or refer them to the Digital Health Champion.

## Appendix 2: Adapted phase one Table of Changes for PPI

### Patients

Key Issue	Evidence	Proposed solution
<p><b>Privacy concerns, i.e. Not knowing who is looking at their data and if the app flags issues to outside companies</b></p> <p>(Patients who use and 1 who does not use)</p>	<p>"It comes up with all these questions and that's when I thought, hang on, who's looking at all this?" (Patient)</p> <p>"I mean all the details I put on there each day. I don't know where that goes and I don't know who is reading it" (Patient)</p>	<p>In the initial stage of prescribing it, be clear on who can access the data, who will be looking at it, and how it will be used.</p> <p>(Referrer guide)</p>
<p><b>Some confusion about whether they are using the app correctly and why certain questions are being asked</b></p> <p>(Patients who use and 1 who does not use)</p>	<p>"There's no feedback from them...there is just no one to get back to, to say, you know, am I doing things right?" (Patient)</p> <p>"Ask you about COPD; not everything else" (Patient)</p>	<p>Provide clarification of each section and its purpose. This could be in the form of a guide that accompanies the app</p> <p>Offer leaflet when enrolling</p> <p>'How to use' video of each section. (visual guide to show how to input meds. i.e. put in first 3 letters)</p> <p>Use more positive language, less confrontational language in the app</p>
<p><b>Psychological aspect of the app makes some patients unreceptive and consequently some HCPs expect low engagement</b></p> <p>(Patient and HCP who don't use, DHC that does use)</p>	<p>"They ask you how you feel today. A lot of it is like mental health and I'm cagey about answer them questions as well. 'cause I haven't got mental health" (Patient)</p> <p>"It will benefit a certain proportion of the population...those who have insight into the fact that they're actually engaging with some psychological side of things" (HCP)</p> <p>"I don't think patients and sometimes healthcare professionals put a lot of weight on the other aspects of COPD management like keeping moving like their nutrition, like their mental health" (DHC)</p>	<p>Linked to above, this could be aided with a guide that provides justification for the psychological aspect</p> <p>Emphasise the importance of long-term components like weight management as opposed to the more immediate medical aspects like steroids and inhaler use</p>

### Healthcare professionals (HCP)/Commercial stakeholder (CS)/Digital Health Champions (DHC)

Key Issue	Evidence	Proposed solution
<p><b>HCPs expect older patients to be less engaged with the app</b></p> <p>(CS, DHCs that use, HCPs that doesn't use)</p>	<p>"Discussions I've had before, and even my own perceptions was that the elderly aren't likely to use these, and actually that's total rubbish. Our average age of user is 75" (CS)</p> <p>"Maybe the app might be better suited for your newly diagnosed younger patients who are probably more technologically savvy" (HCP)</p>	<p>Promote strategies to ascertain who will not benefit. Not all patients will be eligible, i.e., those strictly against using an app</p> <p>Shed light on the receptiveness of apps in older patients with the pandemic accelerating the embrace of new technology</p> <p>Provide case studies on older patients</p> <p>Patient testimonials</p>
<p><b>Concern that prescribing over the phone isn't as effective for promoting engagement compared to in-person prescribing</b></p> <p>(DHCs that does use and HCPs that do not use)</p>	<p>"If it's done in a face-to-face consultation and the message has got across from the very beginning that this is to work in partnership with what they're already receiving" (HCP)</p> <p>"That would help with how confident I feel trying to encourage patients to use the app is being able to actually show them on the tablet on a device" (DHC)</p>	<p>Face-to-face prescribing has arisen as a suggestion of increasing HCP confidence, increasing engagement, and ease of sharing information. Having something physical to hold came up as a suggestion from a number of participants</p> <p>Multiple offers with consistent messaging, directed use of the app.</p> <p>A DHC suggested that since setting up the app is a lengthy process, assure patients that it gets easier and more personalised after the initial stage.</p> <p>Dissemination from DHC to broader team in how they can signpost.</p>
<p><b>Concern that patients will see the app as a replacement for their care</b></p> <p>(DHCs that do use and HCPs that don't use)</p>	<p>"There can be a lot of misconception about is that you get given an app to replace something" (DHC)</p> <p>"I think it's getting the balance right, isn't it, between sending patients away with an app and saying right, you're on your own versus keeping enough contact with them so they don't feel like they're completely left out in the wilderness." (HCP)</p>	<p>Dispel misconceptions about the app being a face-to-face replacement and make it clear from the beginning.</p> <p>Repeating the message through education.</p>



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