STUDY PROTOCOL

PHARM-LC: What role can Community Pharmacy play in supporting people with long Covid? Protocol for a mixed methods study

[version 1; peer review: 1 approved]

Tom Kingstone[1,2], Katie Saunders[1,2], Tamsin Fisher[1], Sukvinder Bhamra[3], Tracy Briggs[4], Adele Higginbottom[1], Paula Higginson[5], Geraint Jones[6], Amali Lokugamage[7,8], Ian Maidment[9], Margaret O'Hara[10], Matthew Shaw[5], Pharm-LC Clinical Advisory Group, Carolyn Chew-Graham[1,2]

[1]Keele University School of Medicine, Keele, England, UK
[2]Midlands Partnership university NHS Foundation Trust, Stafford, England, UK
[3]Division of Natural Sciences,Medway School of Pharmacy,, University of Kent, Canterbury, England, UK
[4]Division of Evolution, Infection and Genomics, The University of Manchester, Manchester, England, UK
[5]Centre for Pharmacy Postgraduate Education, Manchester, UK
[6]NHS Wales Health Education and Improvement Wales,, Nantgarw, Wales, UK
[7]Whittington Health NHS Trust, London, England, UK
[8]University College London, Institute of Women's Health, London, England, UK
[9]Aston Pharmacy School, Aston University, Birmingham, Birmingham, England, UK
[10]Long Covid Support, United Kingdom, UK

v1 **First published:** 21 Oct 2024, **4**:65
https://doi.org/10.3310/nihropenres.13741.1
Latest published: 21 Oct 2024, **4**:65
https://doi.org/10.3310/nihropenres.13741.1

Abstract

Background

Long Covid is a debilitating multifaceted condition, that is more prevalent in those from deprived areas, females and those with another disorder or disability. Those that live with Long Covid currently must endure a lack of services, support and have also reported being 'gaslit' by health care professionals. Primary care services such as GP surgeries are under immense pressure and have limited resources to offer those that live with Long Covid. Community pharmacy could be a localised solution for those that need support and advice for Long Covid as they have already proven to be a reliable source during the COVID-19 pandemic. This study aims to address gaps in research to explore the possible role that community pharmacy teams can play in supporting those living with Long Covid.

Open Peer Review

Approval Status ✓

	1
version 1 21 Oct 2024	✓ view

1. **Shubashini Gnanasan**, MARA University of Technology, Puncak Alam, Malaysia

Any reports and responses or comments on the article can be found at the end of the article.

Protocol

A two-phase multi-method study using semi-structured interviews and co-design will be utilised. For phase one: two population groups; those with lived experience of Long Covid and community pharmacy team members will be interviewed to understand their current experiences of community pharmacy supporting those living with Long covid, as well as lived experiences and self-management (people with Long Covid), and training needs, and current practice (Community pharmacy teams). For phase two: a co-design approach will be utilised with key stakeholders to help inform online training via multiple workshops. This training will be then piloted by end users, who will provide post training feedback via a survey.

Discussion

Understanding the role that community pharmacy can play in supporting those with Long Covid and to facilitate development of this new support pathway to develop online training which provides pharmacy teams with a structured and cohesive approach to care.

Plain Language summary

Long Covid, the persistence of symptoms after acute COVID-19 infection with SAR-COV-2 virus affects about 2 million people in the UK. Long Covid is not typical to one set of symptoms, but examples include: extreme fatigue, shortness of breath, aches and pains and difficulties concentrating (“brain fog”). Those with an existing disability, are Inactive or not looking for work, Social Care Workers, Health Care workers, and women are at higher risk of developing Long Covid.

Primary care plays a key role in supporting people living with Long Covid. This includes community pharmacy, which can support people who may not seek help from their GP or have difficulty in seeing their GP. There are over 11,700 community pharmacies in the UK. These are usually conveniently located and can be accessed without appointment. Community pharmacy staff could provide support for Long Covid, but further research is needed to understand how.

In this study, we will explore experiences of people living with Long Covid to understand how they manage their symptoms and who they seek help from and how staff in community pharmacies could support them. We will also explore the views of staff working in community pharmacies to understand their role in providing support for Long Covid. We will then work with pharmacy educators, healthcare professionals, members of the community pharmacy team, and members of the public to design new online training for community pharmacy staff. Training will help community pharmacy staff support people living with Long Covid.

Two public collaborators (GJ and TB) with lived experience of Long Covid have been actively involved in developing the study. A public/patient advisory group of 10+ people with lived experience of Long Covid from diverse backgrounds has been established. This group will provide patient/public input to the research design, findings and development of the online training module.

Keywords
Protocol, Long Covid, Pharmacy, Qualitative methods, Co-Design, Education, Community pharmacy, post COVID-19 condition.

Corresponding authors: Tom Kingstone (t.kingstone@keele.ac.uk), Katie Saunders (k.saunders@keele.ac.uk)

Author roles: Kingstone T: Conceptualization, Funding Acquisition, Writing – Original Draft Preparation, Writing – Review & Editing; **Saunders K**: Writing – Original Draft Preparation, Writing – Review & Editing; **Fisher T**: Writing – Original Draft Preparation, Writing – Review & Editing; **Bhamra S**: Conceptualization, Funding Acquisition, Writing – Review & Editing; **Briggs T**: Conceptualization, Funding Acquisition, Writing – Review & Editing; **Higginbottom A**: Conceptualization, Funding Acquisition, Writing – Review & Editing; **Higginson P**: Conceptualization, Funding Acquisition, Writing – Review & Editing; **Jones G**: Conceptualization, Funding Acquisition, Writing – Review & Editing; **Lokugamage A**: Writing – Review & Editing; **Maidment I**: Conceptualization, Funding Acquisition, Writing – Review & Editing; **O'Hara M**: Conceptualization, Funding Acquisition, Writing – Review & Editing; **Shaw M**: Conceptualization, Funding Acquisition, Writing – Review & Editing; **Chew-Graham C**: Conceptualization, Funding Acquisition, Writing – Original Draft Preparation, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: This studyproject is funded by the National Institute for Health and Care Research (NIHR) under its [Research for Patient Benefit. NIHR: 205384.(Grant Reference Number NIHR205384)]. The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care. Carolyn Chew-Graham is part funded by the NIHR Applied Research Collaboration West Midlands (ARC WM) [Ref: NIHR200165]. The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care.
The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

How to cite this article: Kingstone T, Saunders K, Fisher T *et al.* **PHARM-LC: What role can Community Pharmacy play in supporting people with long Covid? Protocol for a mixed methods study [version 1; peer review: 1 approved]** NIHR Open Research 2024, **4**:65 https://doi.org/10.3310/nihropenres.13741.1

First published: 21 Oct 2024, **4**:65 https://doi.org/10.3310/nihropenres.13741.1

Introduction

Background

The patient-preferred term for symptoms that persist for 12 or more weeks following a COVID-19 infection, is known as Long Covid[1]. Reports indicate that Long Covid now affects around 1.9 million adults in the UK, some with persistent symptoms lasting for over one year[2]. Long Covid is reported in 44% of people 28 days after a COVID-19 diagnosis; with 200 million people thought to be affected globally[3]. 'Post COVID-19 syndrome' is an overarching term for a complex, multisystem illness following COVID-19 infection, regardless of its severity, irrespective of recovery time or perceived recovery[1]. The World Health Organization (WHO), National Institute for Health and Care Excellence (NICE) and Systematized Nomenclature of Medicine Clinical Terms (SNOMED) International (https://www.snomed.org/)[4] have all adopted the term 'post COVID-19 condition' for classification. However, through the exchange of lived experiences, patient groups within the UK identified 'Long Covid' as their preferred term[5] – we will continue to use this term in our research.

People at higher risk of Long Covid include females, people aged 35–69 years, those working in health and social care, people living in more deprived communities, and people with another health condition or disability[6]. Symptoms of Long Covid have a great impact on daily life and can be physical, cognitive, and/or psychological[7–9]. Office for National Statistics (ONS) data indicates that fatigue is the most common symptom (by 71% of those with self-reported Long Covid), along with difficulty concentrating (52%), shortness of breath (48%) and muscle ache (47%)[6]. Long Covid is a burdensome and debilitating condition, data from 10 UK population-based longitudinal studies suggests that 13.7% of people living with Long Covid experience symptoms that limit their day-to-day function[10]; with the latest ONS data suggesting 79% (1.5 million) experience symptoms that adversely affect daily activities, and19% (380,000) report that daily activities have been "limited a lot"[6]. Organ damage is also reported to persist in three-in-five of those with Long Covid, 12 months after initial infection – which may have long term implications[11].

People living with prolonged symptoms following acute COVID-19 infection experience significant uncertainty about managing their immediate symptoms, sense of recovery and longer-term health; this is reinforced by social stigma and a lack of public awareness about Long Covid, which can contribute to worry and distress[12,13]. People with ongoing symptoms following COVID-19 are not always believed or may have their symptoms dismissed as 'mild', which invalidates their sense of illness and may be perceived as 'gas-lighting'[14]. These experiences may drive a reluctance among people with Long Covid to seek help[15]. Thus, being believed and not having symptoms dismissed as anxiety were crucial to facilitate further help-seeking[16].

Primary Care within the UK is under immense pressure due to a myriad of factors such as funding, limited resources and GP job satisfaction, and patient satisfaction[17]. In an attempt to combat access issues primary care practices have been integrating remote consultations into practice since the onset of the COVID-19 pandemic[18] with these consultations showing an improvement in access to care and enabling staff working in General Practice to manage workloads more effectively[18–20]. However, remote consultations are not always applicable for those that are at a greater risk of Long Covid such as residents in more deprived areas, or/and those are living with a disability[21,22]. Indeed, there were initial attempts to provide online resources and establish clinics for those living with Long Covid, these have since proved to be challenging to sustain due to high demand, with access being limited and subject to residential areas along with difficulties in underrating uptake and engagement with online resources[23–28]. Recent evidence also suggests that people living with Long Covid may not seek help from primary care due to these difficulties in access; instead relying on guided self-management[10]. People living with Long Covid commonly access support groups, particularly online, to share experiences and inform self-management strategies; however, engagement with these groups is often driven by a perceived lack of understanding and empathy from others, including healthcare professionals[12].

Community pharmacies operate in over 11,700 locations in the UK and provide ongoing, opportunistic support to people with a range of health problems[29–31], as well as their key supporting role when it came to the COVID-19 vaccine roll out and supporting patients during the pandemic[32,33]. They are an integral part of NHS primary care services and offer people a link to local health and social care[12,15], especially for those that have long term conditions, and for those that live in more deprived areas, due to their proximity (people are closer to a pharmacy than a general practice)[15,16,31,34–36]. Furthermore, due to the accessibility of these community[32] pharmacies and that people are able to walk-in to get advice, signposting and recommendations; they may represent a convenient and plausible public health setting to offer support to people with Long Covid[30,32,37,38]. The Royal Pharmaceutical Society (RPS) further acknowledge the role pharmacists have in supporting people with Long Covid; the Society recommends pharmacists should be engaged in research on Long Covid and have time protected to keep up to date with the latest evidence and learning resources on Long Covid[39,40].

Existing research acknowledges the prevalence and the lived experiences of those that have Long Covid, as well as the barriers to seeking care and support[6,10–13]. Research also provides insight into current primary care practices for those with Long Covid which highlights a key gap in research where the role of community pharmacy in supporting those with Long covid can be explored. This research aims to address this gap by exploring how community pharmacy teams can support those with Long Covid effectively through a series of work packages (a group of related tasks within a research project), workshops, engagement, and opportunities for training.

Study aims and objectives

Aim

To explore the role of community pharmacy in supporting the management of people living with Long Covid.

Objectives

1. To explore the lived experiences of people living with Long Covid, self-management strategies, and past/current/future help-seeking from community pharmacy teams.

2. To explore attitudes and beliefs among community pharmacy staff (e.g. pharmacists, pharmacy technicians, pharmacy assistants) about their potential role in supporting people with Long Covid.

3. To co-design an online training resource which will delivery knowledge, skills, attitudes and confidence to enable community pharmacy-led support for people living with Long Covid. The Centre for Pharmacy Postgraduate Education (CPPE) will facilitate the development of and host this training resource.

Methods

A two-phase multi-method study using semi-structured interviews and co-design

Ethical approval

The study received ethical approval from Keele University Research Ethics Committee (REC) on 01/05/2024 (REC number: 2024-0791 950) and will adhere to the ethical principles set out in the Declaration of Helsinki[41]. this included the study protocol, written informed consent forms and other relevant documents e.g. advertisements. Based on recruitment, consenting and data collection activities i.e., not recruiting NHS patients, recruiting staff based on professional role (not NHS service). As such, Health Research Authority (HRA) approvals will not be required. All documents have been approved for use by the ethics committee.

Consent forms include statements that confirm the participant consents to be involved in the study but also that their anonymised data, and words provided in interviews could be use in publications.

Patient and Public Involvement and Engagement (PPIE)

People with lived experience of Long Covid (experts by experience) were actively involved in developing this grant. We consulted a range of people with lived experience of Long Covid including members of Long Covid Support peer support group (Margaret O'Hara – Long Covid Support [LCS]), Greater Manchester Long Covid Support Group (previously Manchester Clinical Commissioning Group), and members of a patient stakeholder group that supported the PERISCOPE study (CI- Maidment)[33]. Jones and Briggs are co-investigators with lived experience of Long Covid. Both have contributed to the development of the proposal, funding application, and drafting of the protocol. They will continue to play integral roles in this research, including data collection and analysis.

A Patient Advisory Group (PAG) will be convened of about 10 individuals with lived experience of Long Covid. Diversity among members will be actively encouraged with members identified through LCS and ethnic minority community networks established in other research. A PPIE project officer will be responsible for supporting PPI members throughout the study, coordinating meetings and processing reimbursements (PPI members will be reimbursed as per NIIHR guidelines based on activity type). Higginbottom (AH) will also identify training needs and contribute to developing meeting agendas to ensure activities incorporate the national standards for PPIE.

The PAG will meet up to 4 times during the study (either in-person or virtually via secure video-conferencing platform), providing input at different stages; including commenting on public-facing documents for the ethics application, recruitment methods, data collection, preliminary findings, co-design of training materials, and dissemination. The research team will produce summary notes from meetings and conversations with PAG members to ensure key contributions are recorded and actioned. An excel spreadsheet will be developed to record PAG suggestions and research team actions i.e., "they said: we did". Summary reports and key actions will be reported back to PPI members.

A Clinical Advisory Group (CAG) has been established and clinicians (see acknowledgements for a full list of CAG members) with experience within pharmacy and wider primary car and/or Long Covid will be invited to 4 meetings throughout the study. The CAG will support the team with recruitment, advise on data analysis and dissemination among other roles. Summary notes will be produced from each meeting to ensure key contributions are recorded and actioned.

Conceptual and theoretical framing

The research adopts a broadly interpretivist approach, the notion that reality is subjective and social constructed[42] and therefore seeks to understand perceptions and subjective experiences of others in relation to Long Covid. In this study context, experiences of people with Long Covid and community pharmacy staff will be explored to understand health and healthcare experiences, needs, expectations and preferences. Relevant psychological and sociological theories will be identified during the research process to inform data collection, sensitise the process of analysis, and allow development of a conceptual understanding that goes beyond individual-level data.

Phase 1 (Qualitative study: semi-structured interviews)

This phase of the study aligns with Objective 1 and 2.

Semi-structured interviews will be conducted with people with Long Covid (n~20) and community pharmacy staff (n~20) to explore experiences of symptom management and their engagement with community pharmacy (past/current/future). This qualitative approach, informed by interpretivism, will support an in-depth exploration of individual experiences and beliefs about Long Covid, its management

and self-care methods[43]. Recognising and documenting researcher positionality through reflexivity will be critical in our approach to inquiry, as people with lived experience of Long Covid (Briggs, Jones) will be involved in data collection and data analysis.

Settings

People with self-reported Long Covid in the UK and community pharmacy staff working in the UK. Staff will be recruited based on their professional role.

Data collection methods, sampling strategy and recruitment

Qualitative methods using semi-structured interviews

Sample size estimates are derived from previous qualitative research conducted by the team and informed by contemporary methodological debates about the concept of saturation[44,45].

People with Long Covid

Up to 20 people with self-reported Long Covid will be recruited via social media (to include, but not limited to, Facebook^{R}, X^{R}), personal and professional networks. We will also use a snowball method[46] of recruitment.

Community pharmacy staff

Up to 20 community pharmacy staff (e.g. Pharmacist, Pharmacy Technician, Pharmacy Assistant) will be recruited to participate in this part of the study. An equal representation of different roles will be approached to partake in the study.

Community pharmacy staff will be recruited via personal and professional networks (for example, Centre for Pharmacy Postgraduate Education (CPPE), and social media (to include, but not limited to, Facebook^{R}, X^{R}). We will also use a snowball method of recruitment.

A mixed recruitment strategy will be adopted to support inclusion and maximise diversity of the sample for both people with Long Covid and community pharmacy staff – UK-wide recruitment is planned (Table 2). A purposive approach to sampling will be guided by a set of inclusion criteria (listed below). Recruitment will be regularly monitored to assess sample diversity against key demographic characteristics (e.g., ethnicity); this will help the research team to identify gaps in recruitment and potentially missing perspectives. Snowball sampling will also be used, with participants encouraged to share information about the research with people in their own networks.

Inclusion and exclusion criteria

As well as previously discussed recruitment strategies (e.g., social media, professional and personal networks) physical materials (posters) will be displayed on noticeboards based in community hubs and religious centres. People living with Long Covid (Table 1) will be identified based on self-reported symptoms. No NHS research sites, or patient identification centres (PICs) will be used in this research.

Advertisements will sign-post potential participants to the study website (PHARM-LC - Keele University) for further information and provide contact details (telephone, email) for the research team. Prospective participants will be directed to contact the research team to express their interest in the study and to request further information. On request, a member of the research team will send a copy of the relevant participant information sheet (PIS) to the individual and follow-up to confirm participation (by email or post). If the individual does not reply after three follow-up attempts, no further follow-up will be made.

To schedule an interview, a member of the research team will contact (telephone or email) the individual to confirm eligibility. If eligible, an interview will be scheduled according to participant preferences (see 3.1.5 for interview format options) and consent will be obtained prior to data collection (see 3.1.4). Participants will be offered a shopping voucher after completing an interview. A 'thank you' letter/email will

Table 1. Inclusion and exclusion criteria for people living with Long Covid (Phase 1).

Inclusion criteria	Exclusion criteria
Self-report prolonged symptoms of COVID-19 4-weeks post-infection (example list of symptoms: breathlessness, tachycardia, fatigue that interferes with daily life, "brain fog" – difficulty concentrating, headaches, dizziness, change in smell or taste, anxiety, and stress). Age 18 years and over. Living in the UK. Can speak English sufficient to consent.	Has been less than 4 weeks since COVID-19 infection. Under 18 years of age. Does not demonstrate capacity to consent.

Table 2. Inclusion and exclusion criteria for Community Pharmacy Staff (Phase 1).

Inclusion Criteria	Exclusion Criteria
Pharmacist, Pharmacy Technician, Pharmacy Assistant currently employed in community pharmacy practice in the UK. Age 18 years and over.	Under 18 years of age

be provided with the voucher and details of the website where research findings will be published.

The research team have designed processes to reduce the potential for "imposter participants" (individuals expressing interest in research participant who falsely claim to meet the eligibility criteria) to disrupt data collection on this study. There has been an increase in reporting of this phenomenon[47]. Hence, in the first instance the research team will attempt to conduct recruitment via established and legitimate communities and groups (as described above), but this may not always be possible. Thus, pre-interview eligibility checks will be closely monitored and audio recordings from interviews will be reviewed to check for similarities and signs of false claims, prior to sending recordings for transcription or providing payment for participation.

Most interviews will be conducted by a member of the research team with a background in qualitative methods. Remaining interviews will be conducted by co-investigators with lived experience of Long Covid (Briggs, Jones) – qualitative interview training and support will be provided. All interviewers will have a Good Clinical Practice (GCP) certificate. Interviews will take place either face-to-face, in a convenient location for the participant (e.g. at one of the collaborating universities, the participant's home, private room/space in the community), by telephone or online via MS Teams (or equivalent). The researcher will conduct telephone and online interviews in a private room or office, where confidentiality can be assured. Interviews with people living with Long Covid are expected to last up to 60 minutes, interviews with pharmacy staff are expected to last up to 60 minutes. Interviews will be recorded and transcribed for analysis, consent will be obtained prior to the interview to record and be transcribed by an external company (The Transcription Company), who have a confidentiality agreement with Keele University.

Discussion during interviews will be facilitated by the researcher using a topic guide (separate topic guides will be specifically designed for people living with Long Covid or community pharmacy staff). The topic guides have been developed based on existing research and with input from people with lived experience of Long Covid and community pharmacy practice. The topic guide covers experiences of living with and/or managing Long Covid, access to healthcare services, engagement with and acceptability of community pharmacy providing advice and support about Long Covid. Interviews with pharmacy staff will explore experiences of delivering services to people with Long Covid, training needs, and training and service delivery preferences.

Data analysis

Interview transcripts will be pseudonymised prior to analysis; participant names will be replaced with a unique study code (e.g., PLC001 people with Long Covid, CPS001 community pharmacy staff) and data that may identify the individual (place names, healthcare provider names) will be removed.

Interview data will be analysed using a thematic framework approach[48]. The two datasets ([i] people with Long Covid; [ii] community pharmacy staff) will be analysed separately at first, then combined to establish a framework of cross-cutting themes. Data will be coded using a data-driven approach with codes then used to develop and refine themes of the framework. Analysis will be guided by the concept of saturation, applied at a theme level[45,47–49]. Themes which do not fit the framework will be reviewed and retained for reporting separately. The qualitative researchers will lead data analysis and discuss preliminary findings with the multidisciplinary research team (primary care, pharmacy, social science, experts by experience), to enhance rigour. PAG and CAG members will review preliminary findings. Interview topic guides will be updated, iteratively, to support exploration and enhance development of key themes.

Findings will inform Phase 2 of the project, which seeks to develop the online training and information resources.

Phase 2: (Co-design and pilot of training for community pharmacy staff)

This phase of the study responds to Objective 3.

A participatory co-design approach involving key stakeholders will inform the development of a novel fit-for-purpose online training resource. The primary aim of the online training will be to develop knowledge, skills and attitudes needed by community pharmacy teams to enable them to offer a quality assured, evidence-based advice and signposting service for people living with Long Covid. The learning will also improve confidence of pharmacy teams to ensure delivery of optimal primary care support for people living with Long Covid. The online training will introduce learners to existing Long Covid resources to facilitate ongoing learning and it will promote critical appraisal skills to support staff to assess the quality of new evidence as it emerges. A certificate of completion will be provided to learners, which can support evidence for revalidation or CPD (Continued Professional Development) requirements, for example for the GPhC (General Pharmaceutical Council). The participatory co-design will adopt the CPPE (University of Manchester) rigorous, quality assured and well-established approach to learning programme development. The CPPE approach is grounded in education theory and seeks to promote inclusion, person-centred care, cultural competence and positive change in practice – as demonstrated elsewhere[50]. Self-efficacy theory[51] and self-determination theory[52] will be used to underpin the development of the training resource and guide behaviour change among learners by establishing understanding and the confidence to apply knowledge.

Stakeholder workshops to co-design training

Two workshops are planned to support the co-design of training. Workshops will take place face-to face at Keele University or in a central location convenient for most participants, or online via MS Teams (or equivalent) if participants prefer. A hybrid approach will be made available to

accommodate mixed preferences should this be required. Stakeholders will include up to 20 individuals with representation from topic experts, people with lived experience of Long Covid, primary care practitioners, community pharmacy staff, and research team members. Stakeholders will be identified from the pool of qualitative participants (Phase 1), the PAG, CAG, and existing networks.

The first workshop will guide stakeholders through the process of designing the scope of the training (e.g., writing learning outcomes, agreeing content and format of delivery structure, creating practice-based learning activities to meet different adult learning styles, producing outlines/templates for additional resources). Findings from Phase 1 qualitative interviews will be used during this workshop, together with national priorities, agendas, guidance, and legislation relevant to Long Covid, to prompt discussion and inform the initial scope. This workshop will be facilitated by CPPE and include a variety of interactive activities to promote active participation, respect, power and knowledge sharing, reciprocity, and relationship development[53,54]. The research team and collaborators will record and review discussions from the first workshop to develop prototype designs, which will then be reviewed in the second workshop.

The second workshop will focus on reviewing prototype content and capturing feedback on content, clinical accuracy, and educational appropriateness to support further refinement. Mapping tables will be used to ensure that the content and user requirements highlighted for inclusion in the module incorporate the identified behaviour change theories[51,52], and align with the digital vision for the NHS and relevant health and public health stakeholders. Revisions will then be made as required to finalise the training resources. Stakeholders attending the workshops will be reimbursed for their time at £25 per hour (in line with NIHR involvement rates)[54] and reasonable travel expenses, where transport has been required.

Piloting training with end-users

The research team will pilot the training with community pharmacy staff, prior to making the online training widely available. The pilot will involve a full run-through of the online training course, pre- and post-training assessment, a review of any additional training resources, and participation in a focus group. Table 3 details the inclusion and exclusion criteria for the piloting of end users.

Settings

This part of the study involves recruitment of community pharmacy staff working in the UK. Staff will be recruited based on their professional role through existing networks.

Data collection methods, sampling strategy and recruitment

A purposive sample of up to 10 community pharmacy staff (e.g. pharmacists, technicians, pharmacy assistants) will take part in a pilot of the online training. All will be invited to take part in a subsequent focus group to discuss the online training. Participants will be recruited through existing professional networks (e.g., The Midlands Community Pharmacy Practice Network), the pool of participants who took part in Stage 1 interviews but did not participate in one of the co-design stakeholder engagement workshops (due to potential for bias), and snowballing.

Inclusion and exclusion criteria

A digital recruitment poster will be circulated by email and social media via professional networks and mailing lists. The poster will invite prospective participants to contact a member of the research team to express their interest in the research (assumed consent to further contact) and request further information. On receipt of this contact, a member of the research team will check eligibility and share the PIS. The researcher will follow-up with the prospective participant to confirm interest in participating and to schedule a suitable time to conduct the pilot and focus group. After sending the PIS, three follow-up contacts will be attempted; if the individual does not respond then no further contact will be made.

Data analysis

Analysis of pre- and post-training questionnaires will be kept at a descriptive level due to small numbers involved. These findings are intended to provide a signal around impact on learning and suitability of content – findings will also help inform questions during focus group discussion.

Analysis of focus group data will follow a data-driven thematic approach[55], led by a qualitative researcher in the team. Themes will be discussed and agreed with the research team.

Dissemination

Ownership of the data arising from this research project resides with the research team.

A Final Summary Report of the study will be provided to the REC within 1 year of the end of the study.

We are planning the following outputs:

- An online learning module to be hosted by CPPE and ready for national (UK) roll-out.
- Study webpages hosted on collaborating institute websites.

Table 3. Inclusion and exclusion criteria for phase 2.

Inclusion criteria	Exclusion criteria
Pharmacist, Pharmacy Technician, Pharmacy Assistant currently employed in community pharmacy practice in the UK. Age 18 years and over.	Has taken part in an initial interview or co-design stakeholder workshops as part of this study.

- At least 2 peer-reviewed academic journal articles report findings from data analysis of data generated by semi-structured interviews and co-design processes and piloting.
- At least one magazine article (e.g., The Conversation, online and paper) to distil key findings from the research to lay audiences.
- At least one article aimed in professional pharmaceutical journal and/or magazine (e.g., Chemist and Druggist; Pharmacy magazine)
- YouTube video to describe the role of community pharmacies in supporting people with Long Covid
- Plain English summary of research findings
- Infographics to supplement Plain English summaries.
- Up to 5 conference abstracts for clinical and academic conferences (e.g., the Pharmacy Show).

Key outputs will be made publicly available online. Qualitative datasets generated during this research will be made available on reasonable request. Participants will be notified where research findings can be accessed.

Data availability

No underlying data is associated with this article.

Extended data

[Open Science Framework]: [PHARM-LC What role can Community Pharmacy play in supporting people with Long Covid Protocol for a mixed methods study]. https://DOI10.17605/OSF.IO/T2GVJ[56].

The project contains the following extended data:

PHARM-LC P1 Consent form Pharm v1.0 06.03.2024_ LOGO (ethically approved consent for participants recruited from community pharmacy)

PHARM-LC P1 Consent form PwLC v1.0 06.03.2024_LOGO (ethically approved consent form for participants recruited that have lived experience of Long Covid)

PHARM-LC P1 Ppant Info Sheet Pharm v1.1 28.07.2024_ LOGO (ethically approved participant information sheet for community pharmacy teams).

PHARM-LC P1 Ppant Info Sheet PwLC v1.0 06.03.2024_LOGO (ethically approved participant information sheet for people with lived experience of Long Covid).

PHARM-LC P1 Topic guide for interview with pharm staff v1.1 04.06.2024_Shared (ethically approved topic guide for researchers to administer interviews for participants in community pharmacies).

PHARM-LC P1 Topic guide for interview with PwLC v1.2 14.06.2024_Shared (ethically approved topic guide for researchers to administer interviews for participants in community pharmacies).

Reporting guidelines

The consolidated criteria for reporting qualitative studies (COREQ) will be used as the reporting guidelines throughout the project to ensure reflexivity and provides evidence for the credibility of the findings and rigor of the analysis[57].

Pharm-LC Clinical Advisory Group Members

Professor Mark Faghy, Professor of Clinical Exercise Science, Biomedical and Clinical Exercise Research Theme, University of Derby, UK, ORCID: 0000-0002-8163-7032.

Prof Nawar Diar Bakerly, Consultant Respiratory Physician and clinical director, Northern Care Alliance, Manchester Metropolitan University, ORCID: 0000-0003-2102-1997

Dr Gary Lamph, Reader in Mental Health Nursing / Research and Innovation Honorary Consultant Nurse, Keele University / Midlands Partnership University NHS Foundation Trust, ORCID: 0000-0002-4099-2812.

Dr Amali Lokugamage, Consultant Obstetrician and Gynaecologist and Honorary Associate Professor. Whittington Health NHS Trust, London UK & Institute of Women's Health, University College London, UK. ORCID: 0000-0002-7439-2700

Consultant Obstetrician and Gynaecologist and Honorary Associate Professor. Whittington Health NHS Trust, London UK & Institute of Women's Health, University College London, UK. ORCID: 0000-0002-7439-2700

Ms Rose-Marie O'Byrne, Pharmacist Lecturer, Keele University, ORCID: 0000-0002-5970-5772

Dr Hiyam Al-Jabr, Research Fellow in Epidemiology/ Senior Research Associate, Keele University/ Midlands Partnership University NHS Foundation Trust, ORCID: 0000-0002-4038-3996.

Emma Anderson, CPPE tutor, Centre for Pharmacy Postgraduate education, University of Manchester.

Mr Michael Natt, Lived-experience expert / researcher, Long Covid Support, ORCID: 0009-0007-6639-8073.

Acknowledgments

All those listed within the acknowledgements have provided consent for names and affiliations to be included in the publication.

References

1. National Institute for Health and Care Excellence (NICE): **COVID-19 rapid guidelines: managing the long-term effects of COVID-19.** NICE Guideline [NG188]. 2021; (accessed 07 Nov 2022).
Reference Source
2. Rea M, Pawelek P, Ayoubkhani D: **Prevalence of ongoing symptoms following Coronavirus (COVID-19) infection in the UK**. Office for National Statistics. March 29, 2023.
Reference Source
3. Chen C, Haupert SR, Zimmermann L, *et al.*: **Global prevalence of post-Coronavirus Disease 2019 (COVID-19) condition or long COVID: a meta-analysis and systematic review.** *J Infect Dis.* 2022; **226**(9): 1593–1607.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
4. England, Nhs: **NHS England » SNOMED CT**. n.d.
Reference Source
5. Callard F, Perego E: **How and why patients made long Covid.** *Soc Sci Med.* 2021; **268**: 113426.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
6. Office for National Statistics (ONS): **Prevalence of ongoing symptoms following Coronavirus (COVID-19) infection in the UK**. UK Government, February 2, 2023; (accessed 17 Mar 2023).
Reference Source
7. Ziauddeen N, Gurdasani D, O'Hara ME, *et al.*: **Characteristics and impact of long Covid: findings from an online survey.** *PLoS One.* 2022; **17**(3): e0264331.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
8. Shabnam S, Razieh C, Dambha-Miller H, *et al.*: **Socioeconomic inequalities of long COVID: a retrospective population-based cohort study in the United Kingdom.** *J R Soc Med.* 2023; **116**(8): 263–273.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
9. Reuschke D, Houston D: **The impact of long COVID on the UK workforce.** *Appl Econ Lett.* 2023; **30**(18): 2510–2514.
Publisher Full Text
10. Thompson EJ, Williams DM, Walker AJ, *et al.*: **Long COVID burden and risk factors in 10 UK longitudinal studies and electronic health records.** *Nat Commun.* 2022; **13**(1): 3528.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
11. Dennis A, Cuthbertson DJ, Wootton D, *et al.*: **Multi-organ impairment and long COVID: a 1-year prospective, longitudinal cohort study.** *medRxiv.* 2022; 2022-03.
Publisher Full Text
12. Macpherson K, Cooper K, Harbour J, *et al.*: **Experiences of living with long COVID and of accessing healthcare services: a qualitative systematic review.** *BMJ open.* 2022; **12**(1): e050979.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
13. Pantelic M, Ziauddeen N, Boyes M, *et al.*: **Long Covid stigma: estimating burden and validating scale in a UK-based sample.** *PLoS One.* 2022; **17**(11): e0277317.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
14. Turk F, Sweetman J, Chew-Graham CA, *et al.*: **Accessing care for long Covid from the perspectives of patients and healthcare practitioners: a qualitative study.** *Health Expect.* 2024; **27**(2): e14008.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
15. Ballering A, Hartman TO, Rosmalen J: **Long COVID-19, persistent somatic symptoms and social stigmatisation.** *J Epidemiol Community Health.* 2021; **75**(6): 603–4.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
16. Kingstone T, Taylor AK, O'Donnell CA, *et al.*: **Finding the 'right' GP: a qualitative study of the experiences of people with long-COVID.** *BJGP Open.* 2020; **4**(5): bjgpopen20X101143.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
17. Fisher R, Alderwick H: **The performance of general practice in the English National Health Service (NHS): an analysis using starfield's framework for primary care.** *Health Aff Sch.* 2024; **2**(3): qxae022.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
18. Green MA, Katikireddi SV: **Trends in remote GP consultations for England**. 2021; (accessed 07 Nov 2022).
Reference Source
19. Murphy M, Scott LJ, Salisbury C, *et al.*: **Implementation of remote consulting in UK primary care following the COVID-19 pandemic: a mixed-methods longitudinal study.** *Br J Gen Pract.* 2021; **71**(704): e166–77.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
20. Green MA, McKee M, Katikireddi SV: **Remote general practitioner consultations during COVID-19.** *Lancet Digit Health.* 2022; **4**(1): e7.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
21. Parker RF, Figures EL, Paddison CA, *et al.*: **Inequalities in general practice remote consultations: a systematic review.** *BJGP Open.* 2021; **5**(3): BJGPO.2021.0040.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
22. Charles A, Ewbank L: **The road to renewal: five priorities for health and care**. The Kings Fund. July 16, 2021; (accessed 07 Nov 2022).
Reference Source
23. Gallagher P, Saunders T: **Doctors told to stop sending patients to long Covid clinics at large NHS trusts**. I news. January 21, 2022; (accessed 07 Nov 2022).
Reference Source
24. Baraniuk C: **Covid-19: how Europe is approaching long Covid.** *BMJ.* 2022; **376**: o158.
PubMed Abstract | **Publisher Full Text**
25. Howarth G: **Northern Ireland launces clinics for patients with long-term Covid-19**. Nursing Times Innovations. November 1, 2021; (accessed 07 Nov 2022).
Reference Source
26. Lovett S: **Long Covid: poorest patients denied specialist NHS treatment**. Independent. January 15, 2022; (accessed 07 Nov 2022).
Reference Source
27. World Health Organisation (WHO): **Support for rehabilitation: self-management after COVID-19 related illness.** WHO Europe. 2021; (accessed 07 Nov 2022).
Reference Source
28. Greenhalgh T, Knight M, A'Court C, *et al.*: **Management of post-acute covid-19 in primary care.** *BMJ.* 2020; **370**: m3026.
PubMed Abstract | **Publisher Full Text**
29. Nurek M, Rayner C, Freyer A, *et al.*: **Recommendations for the recognition, diagnosis, and management of long COVID: a Delphi study.** *Br J Gen Pract.* 2021; **71**(712): e815–25.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
30. Todd A, Copeland A, Husband A, *et al.*: **Access all areas? An area-level analysis of accessibility to general practice and community pharmacy services in England by urbanity and social deprivation.** *BMJ Open.* 2015; **5**(5): e007328.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
31. Pantasri T: **Expanded roles of community pharmacists in COVID-19: a scoping literature review.** *J Am Pharm Assoc (2003).* 2022; **62**(3): 649–657.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
32. Bhamra SK, Parmar J, Heinrich M: **Impact of the coronavirus pandemic (COVID-19) on the professional practice and personal well-being of Community Pharmacy Teams in the UK.** *Int J Pharm Pract.* 2021; **29**(6): 556–565.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
33. Maidment ID, Young E, MacPhee M, *et al.*: **A rapid realist review of the role of Community Pharmacy in the public health response to COVID-19.** *BMJ Open.* 2021; **11**(6): e050043.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
34. Gilbody S, Lewis H, Adamson J, *et al.*: **Effect of collaborative care vs usual care on depressive symptoms in older adults with subthreshold depression: the CASPER randomized clinical trial.** *JAMA.* 2017; **317**(7): 728–737.
PubMed Abstract | **Publisher Full Text**
35. Thomson K, Hillier-Brown F, Walton N, *et al.*: **The effects of Community Pharmacy-delivered public health interventions on population health and health inequalities: a review of reviews.** *Prev Med.* 2019; **124**: 98–109.
PubMed Abstract | **Publisher Full Text**
36. NICE: **NICE guideline Community Pharmacies: promoting health and wellbeing.** London: NICE, 2018; (accessed 25 Jan 2022).
Reference Source
37. Department of Health: **Implementing the new Community Pharmacy Contractual Framework.** London, 2005.
Reference Source
38. NHS Confederation: **Health on the high street: rethinking the role of Community Pharmacy.** Pharmacy and public health task force report Birmingham, UK, NHS Confederation, 2013.
Reference Source
39. Royal Pharmaceutical Society: **Long-COVID: Caring for long COVID patients; principles of pharmaceutical care.** (Accessed online 17 Mar 2023).
Reference Source
40. Chang JE, Lai AY, Gupta A, *et al.*: **Rapid transition to telehealth and the digital divide: implications for primary care access and equity in a Post-COVID era.** *Milbank Q.* 2021; 99(2): 340–368 .
PubMed Abstract | **Publisher Full Text** | **Free Full Text**
41. World Medical Association: **World Medical Association declaration of Helsinki: ethical principles for medical research involving human subjects.** *JAMA.* 2013; **310**(20): 2191–2194.
PubMed Abstract | **Publisher Full Text**
42. Chowdhury MF: **Interpretivism in aiding our understanding of the contemporary social world.** *Open J Philos.* 2014; **4**(3): 432–438.
Publisher Full Text
43. Smyth N, Alwan NA, Band R, *et al.*: **Exploring the lived experience of Long Covid in black and minority ethnic groups in the UK: protocol for qualitative**

interviews and art-based methods. *PLoS One.* 2022; **17**(10): e0275166.
PubMed Abstract | Publisher Full Text | Free Full Text

44. Thorogood N, Green J: **Qualitative methods for health research.** Sage London, 2018.
Reference Source

45. Gair S: **Feeling their stories: contemplating empathy, insider/outsider positionings, and enriching qualitative research.** *Qual Health Res.* 2012; **22**(1): 134–43.
PubMed Abstract | Publisher Full Text

46. Naderifar M, Goli H, Ghaljaie F: **Snowball sampling: a purposeful method of sampling in qualitative research.** *Strides Develop Med Educ.* 2017; **14**(3).
Publisher Full Text

47. Gale NK, Heath G, Cameron E, *et al.*: **Using the framework method for the analysis of qualitative data in multi-disciplinary health research.** *BMC Med Res Methodol.* 2013; **13**(1): 117.
PubMed Abstract | Publisher Full Text | Free Full Text

48. Guest G, Namey E, Chen M: **A simple method to assess and report thematic saturation in qualitative research.** *PLoS One.* 2020; **15**(5): e0232076.
PubMed Abstract | Publisher Full Text | Free Full Text

49. Saunders B, Sim J, Kingstone T, *et al.*: **Saturation in qualitative research: exploring its conceptualization and operationalization.** *Qual Quant.* 2018; **52**(4): 1893–1907.
PubMed Abstract | Publisher Full Text | Free Full Text

50. Latif A, Pollock K, Anderson C, *et al.*: **Supporting underserved patients with their medicines: a study protocol for a patient/professional coproduced education intervention for community pharmacy staff to improve the provision and delivery of Medicine Use Reviews (MURs).** *BMJ Open.* 2016; **6**(12): e013500.
PubMed Abstract | Publisher Full Text | Free Full Text

51. Bandura A: **The explanatory and predictive scope of self-efficacy theory.** *J Soc Clin Psychol.* 1986; **4**(3): 359–373.
Publisher Full Text

52. Deci EL, Ryan RM: **Self-Determination Theory: a macrotheory of human motivation, development, and health.** *Can Psychol/Psychol Can.* 2008; **49**(3): 182–185.
Publisher Full Text

53. Grindell C, Coates E, Croot L, *et al.*: **The use of co-production, co-design and co-creation to mobilise knowledge in the management of health conditions: a systematic review.** *BMC Health Serv Res.* 2022; **22**(1): 877.
PubMed Abstract | Publisher Full Text | Free Full Text

54. National Institute for Health and Care Research (NIHR): **Guidance on co-producing a research project**. 2021; (Accessed online 17 Mar 2023).
Reference Source

55. Braun V, Clarke V: **Using thematic analysis in psychology.** *Qual Res Psychol.* 2006; **3**(2): 77–101.
Publisher Full Text

56. Kingstone T, Saunders K, Fisher T, *et al.*: **PHARM-LC What role can Community Pharmacy play in supporting people with long COVID protocol for a mixed methods study.** OSF, 2024.
http://www.doi.org/10.17605/OSF.IO/T2GVJ

57. Booth A, Hannes K, Harden A, *et al.*: **COREQ (Consolidated Criteria for Reporting Qualitative Studies).** *Guidelines for reporting health research: a user's manual.* 2014; 214–226.
Publisher Full Text

Open Peer Review

Current Peer Review Status: ✔

Version 1

Reviewer Report 16 December 2024

https://doi.org/10.3310/nihropenres.14924.r33888

✔ **Shubashini Gnanasan**
Department of Pharmacy Practice and Clinical Pharmacy, Faculty of Pharmacy, MARA University of Technology, MARA University of Technology, Puncak Alam, Selangor, Malaysia

This study is well-designed and addresses an important gap in healthcare by exploring the potential role of community pharmacists in supporting individuals with Long Covid. The use of a two-phase, multi-method approach is timely and appropriate, combining interviews with those living with Long Covid and pharmacy teams to capture various perspectives. The incorporation of a co-design approach with key stakeholders ensures that the resulting training can be both relevant and practical. Overall, the study is robust and innovative, with the potential to create a structured support pathway and enhance community pharmacists' contributions to Long Covid care.

Is the rationale for, and objectives of, the study clearly described?
Yes

Is the study design appropriate for the research question?
Yes

Are sufficient details of the methods provided to allow replication by others?
Yes

Are the datasets clearly presented in a useable and accessible format?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I am a clinical pharmacy lecturer and a qualitative researcher. I have taught qualitative research methodologies to postgraduate students.

I confirm that I have read this submission and believe that I have an appropriate level of

expertise to confirm that it is of an acceptable scientific standard.