Effective workplace learning environments in care homes: Developing, implementing and evaluating a model and implementation toolkit (NIHR164416)

Study Protocol

Study team

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Abstract

Background

Most of the 370,000 people living in the UKs 15,000+ Care Homes (CHs) are older, have complex needs including dementia and health problems. CH staff need the right knowledge, skills and attitudes to deliver good care to this group. Our team has developed the ‘Learning to Care’ (LtC) model elucidating the learning environment in CHs, which includes formal training, informal (shadowing/mentoring) and incidental (on the job experience) learning, set within the influences of workplace culture and resources. Little, however, is known about how to deliver effective learning environments in CHs in practice.

Aims

This study will address this gap by understanding what supportive learning environments look like in CHs and how they can be implemented, answering:

RQ1: What do supportive, inclusive learning environments look like in CHs for older adults?

RQ2: How can a supportive learning environment be operationalised and implemented?

RQ3: What are the impacts of supportive learning environment implementation on staff learning, care practices and costs?

Our objectives are to:

OB1: understand what supportive learning environments inclusive of diverse (demographically and role) CH staff look like and operationalise this through refinement of the LtC model

OB2: co-design a LtC model implementation toolkit and logic model

OB3: understand how the LtC toolkit can be implemented in diverse CHs for older adults, including barriers, facilitators and the impact on costs, staff outcomes and care practices

OB4: refine the toolkit and support its wide adoption

Methods

Mixed-methods study underpinned by the Knowledge to Action Framework with iterative work packages (WPs)

WP1a (Months 1-6): systematic reviews a) mixed methods review of learning environments and their components in CHs, b) review of reviews of learning environments and their components in health and social care

WP1b (m1-18): ethnographic case studies in up to nine diverse care homes from 3 geographic locations, with each case study including: general observations of the learning environment and learning opportunities, focussed observations of individual staff (n= up to 6) and how they learn, informal conversations, semi-structured interviews with staff (n=up to 10) and documentary analysis of training records and other documentation. Combining WP1a/b findings to refine the LtC model.

WP2 (m17-25): intervention co-design of a LtC toolkit to improve CH learning environments, involving CH residents, their relatives, CH staff and managerial/training leads

WP3 (m21-38): implementation of the LtC toolkit in 4 diverse CHs. Mixed methods evaluative case studies and cost-consequence analysis to assess its impact on practice. Collecting the following data at baseline, 3 and 6m into implementation to explore change over time: general observations of the learning environment and learning opportunities, focussed observations of individual staff and how they learn, informal conversations, semi-structured interviews/focus groups with staff, standardised measures of CH and staff outcomes, and documentary analysis of training records.

Lived experience and stakeholder involvement

Two advisory groups of a) CH residents and families and b) staff will input to study design, delivery, analysis, interpretation and dissemination.

Impact and dissemination

The study will produce a refined LtC toolkit that can be implemented in CHs nationally. Skills for Care, the National Care Forum, Alzheimer's Society and other networks will support us to disseminate this and support uptake by CHs, commissioners and policy makers.

1. Background

Most of the 370,000 residents in the UKs 15,000+ care homes (CHs)(1) are aged 65+ and have a range of complex needs including disabilities(2), dementia (c75%)(3) and other long-term conditions(4). CHs for older adults in England are diverse(5) with regards to the type(s) of care provided (residential, nursing, specialist dementia care), size, proportion of self-funding residents and ownership, with around 83% of UK CHs owned by the private sector, 13% by the voluntary sector and 4% by local authorities(6). The approximately 650,000 staff working in CHs are also diverse with regard to their ethnicity, age, educational background, and prior social care experience(7). Around 19% are from overseas(7) and may need additional induction, training and support opportunities to be enabled to do the job well(8). Formal training and development play a crucial role in ensuring staff working in CHs have the knowledge, skills and attitudes to deliver high quality care(9, 10). CH staff also bring a range of prior skills and knowledge to the role. Beyond evaluations of specific training programmes, little research has explored the potentially diverse learning needs of CH staff or how they can best learn to deliver good quality care(11) in different CH environments.

Research shows that providing formal training is not enough to change CH practice(12, 13) and putting formal training into practice can be challenging(14-17). Our NIHR funded research found this is more likely to occur if training is accompanied by informal learning(10, 15) within a supportive learning environment(11). Learning environments are the material (physical and virtual), and psychosocial (personal, social organisational, cultural) spaces where learning takes place. They encompass(18) formal training and a range of informal practices that can support or undermine training implementation such as: i) informal structured learning (e.g. shadowing, mentoring); ii) incidental or unintentional learning resulting from other activities (e.g. trial and error, feedback from residents/colleagues/relatives, problem solving); iii) wider context components including psychosocial (e.g. policies, culture) and material (e.g. CH environment, job roles).

As part of a previous study we conducted and published an extensive review of formal training and education in dementia (10), which included studies conducted in CHs. However, there is a scarcity of research on learning environments in CHs beyond the formal training literature. A Norwegian study(19) reported that enabling learning environments combine formal training and informal learning based on staff needs, set within a wider culture that positively promotes learning. It did not, however, explore how these features interact or how enabling learning environments can be achieved. This, with the feedback gained from consultation with staff in developing this research, indicates learning environments are a largely neglected dimension of staff learning and development in CHs. Thus, we are not aware of any existing interventions to understand and improve the CH learning environment. Given informal and incidental learning opportunities occur continually as part of day-to-day practice, modifying these presents an opportunity to improve staff learning and thus positively impact on practice, without requiring significant additional resource.

The 'Learning to Care' (LtC) model(15, 20) (Fig 1) was developed by co-lead (IL) through in-depth research in two care homes, and is to our knowledge the only model of learning environments in

CHs. Central to the model is how staff make care decisions based on what they judge ‘works’ to deliver desired care outcomes (e.g. what is the best way to get a resident washed and dressed). The dynamic judgement of ‘what works’ is determined by resources available to staff from both formal (training), and informal (e.g. trial and error, asking questions) learning opportunities. These opportunities are shaped by individual factors (previous work and life experience), social/relational factors (feedback from residents, interactions with peers) and organisational factors (care home decision-making and culture), which together constitute the CH learning environment. The LtC model provides a promising basis for developing a comprehensive model of supportive or effective CH learning environments.

Our NIHR funded research(21) provided evidence on the design, content and delivery features of effective formal training in CH settings(10, 16, 22). These have been adopted internationally as policy and practice gold standards(23, 24). We found formal training alongside in-practice learning is most impactful(11).

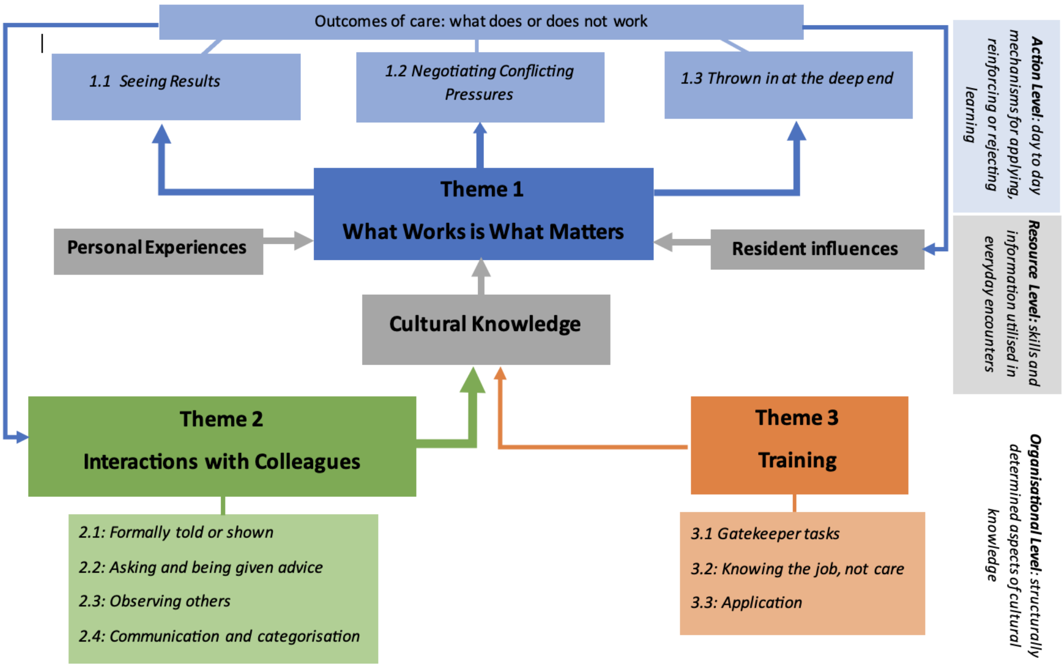


Figure 1: The LtC model

Staff’s experience including work and prior learning is crucial to their knowledge, attitudes and confidence to deliver care(25). This is also key for staff retention, as reported in our recent realist review(26).

There is little published research examining the informal (e.g. supervision(27), mentoring(28)) or incidental learning(29, 30) of CH staff. The few published studies focus on practicalities of how to implement informal learning approaches in CHs or describe individual methods e.g. handover, information seeking(29, 30). They do not examine how staff learn through these methods or the impacts on practice. No studies, except the LtC model, have looked at the interaction of multiple learning environment components, as a whole system impacting how and what staff learn, and how they subsequently practice.

Therefore, despite their importance for effective learning and its translation into practice, there is a dearth of research on learning environments in CHs, with little understanding of: what effective learning environments look like for diverse CH workforces; components of learning environments and how these interact to inform staff knowledge and practice or; how effective learning environments can be achieved. This study will build on our research to address this vital gap by exploring how supportive learning environments can be achieved in CHs, (including nursing and residential homes of different sizes and ownership, in different geographical and socio-economic locations) and with diverse staff (including staff aged under 25 years, those from different cultural backgrounds, night staff and international staff). We will focus particularly on these staff groups because they are under-represented in CH research and may have additional or different learning needs and experiences. For example, younger staff are those most likely to leave their role in the first 12-months of employment(31).

Our study will build on our team's existing research to:

- Provide an in-depth understanding of workplace learning environments in CHs and how they influence the learning and practice of diverse staff.
- Increase staff ability to deliver high quality person-centred care to CH residents with complex needs(32) through developing, implementing and evaluating use of a toolkit to assess, plan and support improvements to and alignment of learning modes in the CH learning environment. This will lead to outcomes of increased staff ability to put learning into practice and to deliver person-centred care (see draft logic model figure 2).
- Address best use of scarce resources in CHs: effective learning environments can maximise use of resources (e.g. better utilisation of influential informal and incidental learning, which already exist as regular sources of learning and reduce risks of formal training not being put into practice).
- Address a key sector challenge of staff retention: effective learning and ability to apply this in practice supports staff to feel prepared for their role, and confident and empowered to deliver good care, leading to increased job satisfaction and retention(26, 33).

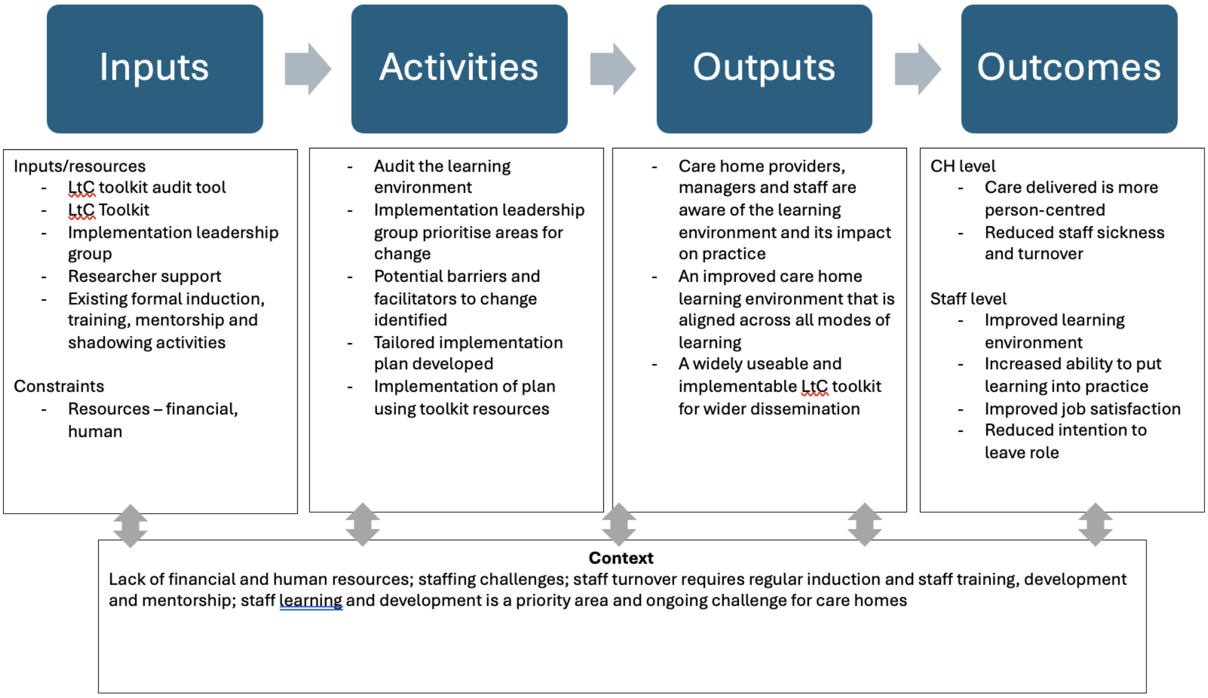


Figure 2: Draft LtC toolkit logic model

2. Aims, research questions and objectives

2.1 Aim

To understand what supportive learning environments look like in CHs for older adults and how they can be implemented in CHs in England

2.2 Research questions

RQ1: What do supportive, inclusive learning environments for producing person-centred care look like in CHs for older adults?

RQ2: How can a supportive learning environment be operationalised and implemented?

RQ3: What is the impact of supportive learning environment implementation on costs, staff learning and care practices?

2.3 Objectives

OB1: Understand what supportive learning environments inclusive of diverse staff groups (including those aged ≤25, night staff, international staff, staff from ethnic minority groups) look like in CHs and to operationalise this through refinement of the LtC model

OB2: Co-design an LtC model implementation toolkit and associated logic model

OB3: Understand how the LtC toolkit can be implemented in diverse CHs for older adults, including barriers and facilitators and the impact on staff outcomes and care practices

OB4: Refine the LtC toolkit, make it available for, and encourage and support wider adoption

3. Research design

A mixed-methods, theoretically driven, three-phase study with iterative work packages (WP) as follows (see figure 3):

Phase 1:

WP1a: systematic reviews (these are not included in this ethics application)

WP1b: ethnographic case studies in up to nine care homes across three recruitment hubs

Phase 2:

WP2: intervention (Learning to care toolkit) co-design including care home residents, their relatives and staff across three recruitment hubs

Phase 3:

WP3: implementation of the toolkit and mixed methods evaluative case studies in up to four care homes across two recruitment hubs

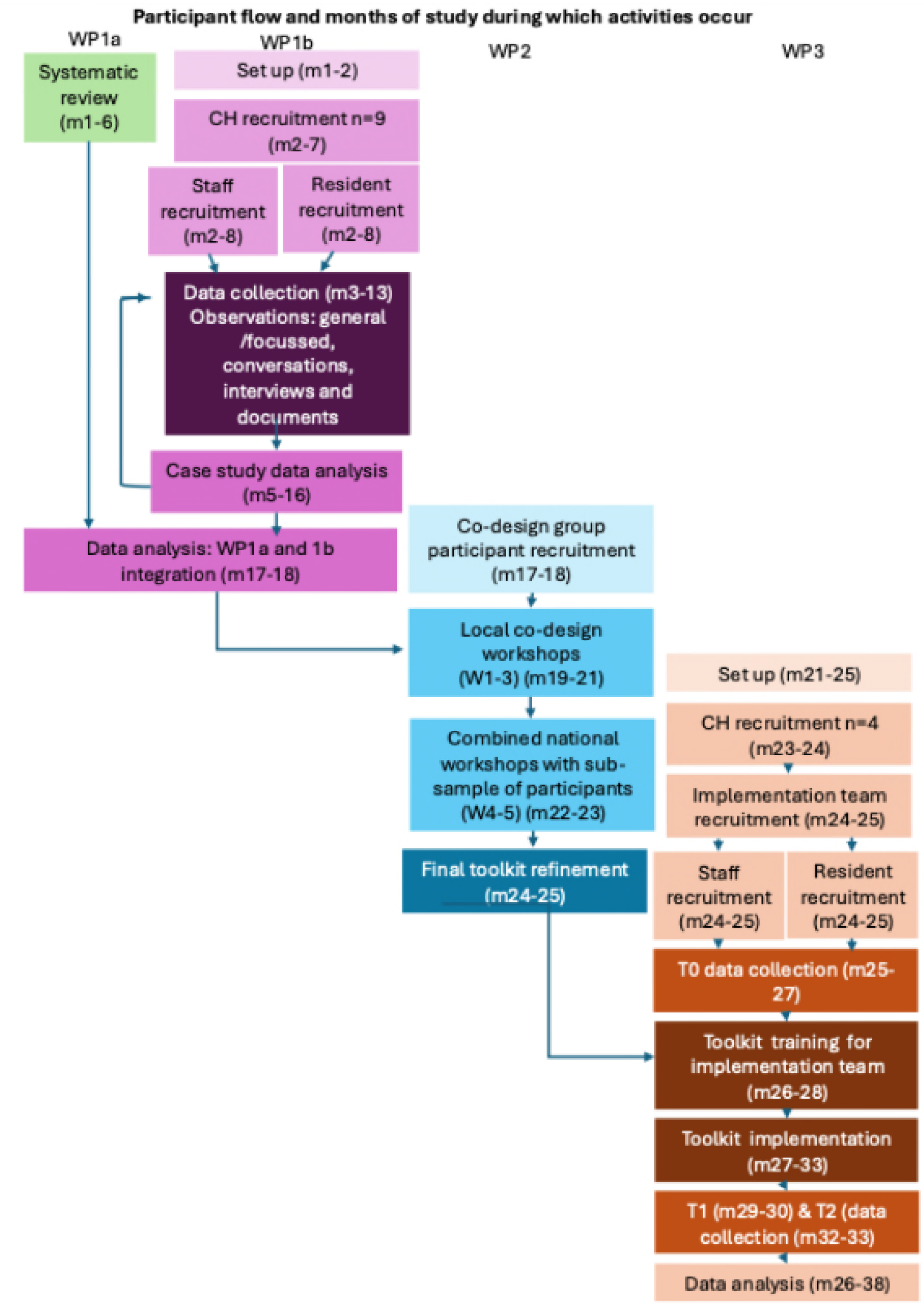
3.1 Theoretical/conceptual Framework

The Knowledge to Action Framework (KAF)(34, 35) will underpin the study design. The KAF is a framework for translation of knowledge into action, is used widely within health and care research, and is therefore well suited to the requirements of this study. It contains two components:

- *knowledge creation* through concurrent stages of knowledge synthesis (WP1a) and knowledge inquiry (WP1b) followed by a further stage of knowledge creation of user-friendly tools/products (WP2), and
- an *action cycle* of activities for effective implementation including adaptation of knowledge to the local context, assessing barriers and facilitators to use, implementation, monitoring of use and evaluation of outcomes (WP3).

The Consolidated Framework for Implementation Research (CFIR) is a framework for assessing the context of interventions and is widely used for predicting and explaining barriers and facilitators to impact (36). It will inform the WP1 data analysis, WP2 toolkit co-design and WP3 evaluation methods and analysis.

Figure 3: Study flow diagram



3.2 Ensuring inclusive research practices

The team have extensive experience in communicating with people living with dementia and with people who have different communication styles for other reasons. We will employ this in supporting residents with additional communication needs to participate in the study, in ways that work best for them. The following will apply to supporting involvement and engagement for all care home residents taking part in the study across all WPs.

General approaches

We will ensure we build relationships with residents that enable them to feel comfortable with the researchers and enable us to become familiar with their preferred communication approaches. We will also ensure we explore with residents, and those who know them best, how we can appropriately communicate. We will focus on creating a friendly, supportive environment for enjoyable research, utilising failure-free approaches that focus on opinion and feelings rather than being able to describe a factual event in detail. We will use objects and pictures to prompt and support discussion and locate conversations in relevant places that help people reference their lived experience.

Individualised approaches

In additional to the general approaches above, the following specific approaches will be used, depending on the needs and preferences of the individuals involved:

Use of Talking Mats as a communication aid: Team members have received training in, and are experienced in using, Talking Mats with older adults, including those with dementia. Talking Mats are a visual communication framework which support people with communication difficulties to express their feelings and views. Talking Mats are used with people living with dementia and/or people with additional communication needs. This method will be shared with the team and utilised where appropriate.

Using creative methods to aid engagement and communication: Our team are experienced in using creative methods (including collaging, card-sorting, story-telling, object work, photo-elicitation and photo-voice) with people with dementia, older adults and care home residents who have additional communication needs to consult and provide research data. These methods will be integrated into all WPs as appropriate, depending on the individual needs and preferences of residents.

Use of ethnographic methods during data collection: The range of data collection approaches and time ethnography affords to collection of data will allow researchers to develop relationships with individuals and will also enable communication in ways that suits individuals best, and with communication and data collection methods tailored to each individual. Our team have expertise in ethnographic methods with people living with dementia, including advanced dementia, to facilitate this.

Flexible approaches to communication throughout: The lived experience/staff advisory group approaches, ethnography and WP2 have been designed flexibly so that workshops, data collection and events can be adapted to the needs of participants. This can include printed materials in advance, large print documents, prompt/reminder phone-calls and one-to-one contact between membership and research team where this would better match participants’ communication needs. We will make participant materials available in languages other than English and provide interpreters to support resident participation in interviews if required.

3.3. WP1 – Ethnographic case studies (Leads Kelley and Latham)

3.3.1 Aims

1) To understand
    - a) key features of supportive learning environments for producing person-centred care in diverse CHs
    - b) the actual/potential influence of learning environment components on staff learning and practice
    - c) barriers and facilitators to a supportive learning environment

2) To develop the LtC model and its associated logic model+

3.3.2 Design

Ethnographic, multiple-case study(37) have been used successfully by our team in other NIHR funded studies evaluating staff training and practice development (REC numbers 15/YH/0488; 23/WA/0198; 18/YH/0145; 23/YH/0261) and the methods and approaches for addressing ethical issues in this study are based on those previously approved in these and other ethnographic studies the team have conducted in care home settings (e.g. 18/YH/0278) (21, 38-42)

3.3.3 Sample

Care homes

CHs for older adults (up to n=9) with a range of characteristics (e.g. residential/ nursing/ dementia specialist, ownership, size, for profit/not-for-profit, % self-funding residents, rural/urban/coastal, CQC rating, located in Yorkshire, Kent/East London and the South West (up to n=3 per geographical site); locations with diverse geography and local population demographics (urban, rural, coastal).

Inclusion criteria

- Care home of any type (residential, nursing, specialist dementia care) that provides care for older adults (aged 65+ years)
- Has a CQC rating of requires improvement, good or outstanding
- Is located in Yorkshire, Kent/East London or the South West of England

Exclusion criteria

- Is rated CQC inadequate

We will not recruit CHs rated as CQC inadequate since, based on our extensive experience, their focus is on meeting basic care needs and CQC requirements and for this reason do not have the resources to participate in research.

CHs will be approached and selected based on using ‘ability to learn’ sampling(43), which selects cases based on maximising what can be learned rather than typicality of a site. Our advisory groups will input on final sampling criteria and CHs to be approached. Our sample size is based on the diversity we anticipate needing across case studies to support development of a flexible toolkit that is relevant to, and can be used in, the full diversity of CH settings, and on sample sizes in similar studies(44-46).

Staff

We will seek formal written consent from staff for participation in interviews (n = up to 10 staff per CH) and as the primary person of interest in focussed observations (n= up to 6 staff per CH) (see section on staff consent below). We will use purposeful sampling of CH staff who will be consented to take part in these study activities (all staff who meet the inclusion criteria for interviews and front-line care workers only for focussed observations) to maximise learning. This may include including managers (organisational/CH), staff with responsibility for delivery of training and development, and front-line care workers. We will specifically sample front-line care staff to gain a more in-depth understanding of the experiences of underrepresented groups (those aged ≤25, night staff, overseas staff, staff from ethnic minority groups) in each CH.

Inclusion criteria for staff who provide written consent to participate

- Staff members who are responsible for frontline care delivery to residents (care worker, senior care worker, activities worker) (interviews and focussed observations)
- Staff members who are responsible for the delivery of training or other learning and development within the care home (interviews and in some cases focussed observations)
- CH managers or other senior staff members within the CH or organisation who have a primary role in overseeing or providing learning or development to staff (interviews)

Exclusion criteria for staff who provide written consent to participate

- Temporary or agency member of staff or student
- Member of bank staff
- Visiting members of staff to the care home e.g. healthcare practitioners
- Volunteers

Due to their transient roles, and limited participation in the CH's learning environment and formal training, temporary agency staff and students are excluded from interviews and being the primary written consented staff member in focussed observations. Bank staff, managers and staff primarily responsible for training/development delivery will be excluded from being the primary written consented staff member in focussed observations. Any staff member may be present as a verbally consented member of staff providing anonymised data for general and focussed observations.

Residents

Up to 8 residents per CH will be approached to consent to take part in the study if they are identified as someone who will be receiving personal care, from one or more of the consented staff members, who will be the staff member of interest in the focussed observations. For example, if a CH operates a key worker or similar approach to care organisation. Once the staff have been recruited and consented to the focussed observations, the researcher will liaise with the staff members and CH manager to identify potential residents to approach. We will aim to recruit a diverse range of residents (e.g. based on gender, ethnicity, degree of dementia, physical disability, degree of independence in care tasks). Our sampling strategy will be refined based on staff interviews and earlier observations about scenarios that provide the greatest learning opportunities but for example may seek to recruit those with more complex care needs (e.g. those who require two staff members to deliver personal care, those prone to distress or to resisting/refusing care).

Inclusion criteria

- Resident who is likely to be residing in the CH for the duration of the data collection period
- Has capacity to give informed consent or where lacks capacity has someone willing to act as a personal or nominated consultee

Exclusion criteria

- Is deemed unfit to participate by a senior member of CH staff (e.g. due to being physically unwell, at end of life or for other personal reasons that may make observation of their care inappropriate)

3.3.4 Recruitment and consent

Care homes

CHs will be recruited via successful engagement methods previously adopted in our research including approaches made via ENRICH, our existing extensive networks of CHs, CH provider groups represented by study co-applicants (collective total of n=300 CHs), social media advertising and direct approach of CHs with specific characteristics. CH consent will be gained from the owner/manager prior to study commencement.

Staff

Our approach to consenting staff and residents for participation in focussed observations is drawn from a recently completed study (23/WA/0198) Surr was involved in, where staff communication practices and application of learning were the focus for data collection in a hospital setting. In the hospital-based study we adopted a proportionate approach to consent where during focussed observations of consented staff members, additional staff or patients with dementia who were present were only asked to provide written consent where personally identifying details would be collected as part of observational data. All other staff and patients were consented verbally and data about them was anonymised at the point of collection. This approach minimises the burden on researchers and participants, where personally identifiable or sensitive information is not being collected, whilst still providing the opportunity for those involved to decline verbally to participate in the observations. In this CH study for example a consented staff member taking part in focussed observations might deliver care to numerous residents at mealtimes, in lounge and corridor areas and during activity provision. It would not be proportionate to consent every resident and staff member they interacted with.

The researchers will visit each CH to introduce the study to staff, for example at staff meetings, handovers and informally as the researchers familiarise themselves with the CH ahead of commencing consent and data collection. Staff participants for interviews and focussed observations will be identified through discussion between the researcher and CH manager to determine eligibility, with the initial approach being made by the staff member following researcher introduction of the study, or by the CH manager or another senior staff member. Following expression of interest in the study, a further discussion with the researcher about what participation entails will occur ahead of formal written consent being obtained. Staff will be informed that participation is voluntary and whether they choose to participate or not will not affect their employment. Staff may decline participation, decide to consent and to sign the consent form at that time or to take further time to consider participation. In the latter case the researcher will arrange a convenient time to return to discuss their participation.

Verbal consent will be gained from staff who are present during general observations, where data collected will be anonymised at point of collection, and for staff present during focussed observations where another member of staff is the primary focus and no personally identifiable information will be collected about others present. We will gain written informed consent staff from present during focussed observations of another staff member, where they have a key role to play in their learning, e.g. as mentor, as a staff member being shadowed as part of induction, or as a training/learning facilitator.

Residents

The research will be introduced to all CH residents via appropriate routes such as resident meetings and informal conversations, ahead of any data collection commencing. Verbal agreement from residents will be sought for general observations and for those present during focussed observations, where data collected about them will be anonymised at the point of collection. This follows a proportionate approach to consent, where gaining written informed consent for everyone present would be unfeasible (e.g. every resident or staff member present during a mealtime or activity session) (47) and where personally identifiable information, words or actions of individual's other than staff members are not the focus of the data collection. The approaches adopted mirror consent protocols we have previously had approved by National Research Ethics committees for observational studies in care homes and NHS settings [REC REF 13/YH0016; 18/YH/0145; 23/WA/0198; 23/YH/0261]. Posters will be placed around the care home as a reminder on days when observations are taking place and short leaflets about the project will be available for each resident.

In a care home environment relatives/carers/supporters of residents may also have an important role to play in discussing the research with residents and in advising staff or the researcher if the resident would prefer not to have anonymised data collected about them. Therefore, the researchers will attend relative's meetings and will provide written information about the study in appropriate formats e.g. e-mail, newsletter item, posters and leaflets.

Residents will be asked to provide formal written consent (or advice from a consultee gained where a resident lacks capacity to give informed consent) to participate in advance of focussed observations of personal care (e.g. personal care in bedrooms or bathrooms - see data collection section below) involving them. Observations of personal care will only be considered where these are key to informing the data collection and where residents do not indicate verbally or otherwise unhappiness with this. Feedback from staff and family members in developing this application highlighted the importance of the delivery of good personal care, the regularity of its provision and that this, therefore, represents an important training need and area of informal and incidental learning to observe.

Residents for focussed observations of personal care will be identified in line with sampling strategy above, through researcher discussion with the home manager and staff who have consented to take part in focussed observations. The initial approach will be made by the manager or a senior member of staff. They will ask if the resident is happy to speak to the researcher about study participation. The manager/senior staff member will make an initial assessment of capacity at this time regarding the resident's ability to make this decision on an informed basis. Where a resident states they do not wish to speak to the researcher, no further approach will be made, whether they are deemed to lack capacity or not.

Where a resident agrees to speak to the researcher, a member of staff will introduce the researcher and will stay during the study discussion if the resident wishes. The researcher will explain the study using the short version of the resident participation sheet and give the resident the opportunity to ask questions. The researcher will make an assessment of capacity at this time, about the resident's ability to make an informed decision about study participation. The resident will be informed that participation is entirely voluntary and choosing to participate or not will not impact their care. When able to make an informed decision the resident may decline to participate, may agree to participate and to sign the consent form at that time, or may choose to take further time to consider participation, potentially discussing this with family or friends. If the latter applies the researcher will arrange a convenient time to return to discuss participation.

Where a resident is deemed to lack capacity to give informed consent, either to speak to the researcher or to decide about study participation, a personal consultee (family member or friend) who can provide advice on what the person's wishes would be, will be identified. They will be approached in person by care home staff, or by telephone, e-mail or letter based on what is deemed most suitable by the care home manager based on knowledge of the consultee. Consultee consent/declarations may be completed via recorded audio/video call with the researcher to offer maximum flexibility, where consultees may visit the care home infrequently. Where no personal consultee can be identified either because the resident has no-one appropriate, or because the identified consultee fails to respond to contact after a further reminder, a nominated consultee will be appointed. They will be a senior member of staff (e.g. manager, deputy or senior carer) who is not directly involved in the research (i.e. as a consented participant) and who can provide advice on what the resident's wishes would be. Should the consultee advise that a resident would wish to be included in the study, the resident will be included as a participant subject to the process consent approach detailed below.

A process consent approach(48), involving repeatedly rechecking consent verbally during data collection, will be adopted for staff and residents. We will follow a proportionate approach to consent information(49). The initial approach to participate will be made using a one-page written participant information leaflet provided in hard copy, summarising key information. Participants will be provided with a more detailed written information sheet in hard copy during the consent process. We have included costs for translation of resident and consultee information sheets and consent documentation and for use of interpreters if required.

Posters, easy read information leaflets and verbal explanations from researchers or staff members will notify residents, staff members and visitors about the study and the days observations will occur. Anyone will be able to opt out. Should an observer's presence appear to be causing a resident distress, the researcher will immediately stop and follow study distress protocols.

3.3.5 Study withdrawal

Participants will be informed they can choose to withdraw from the study at any time without this affecting their employment/care. Data collected to that point will be retained and included in the study. Should a participant wish to withdraw their data they have two weeks from the date the data was collected to do so, after this point data analysis will have commenced and withdrawal of data will not be feasible. Data collected anonymously during general and focussed observations will not be able to be withdrawn.

3.3.6 Data Collection

A researcher will spend intensive time in each CH (n=9) to gain detailed understanding of the learning environment using the following ethnographic methods and samples per CH (see Table 1 for summary). Iterative data collection and analysis will enable responsiveness to developing themes in each CH and across case sites and will inform sampling and decisions about when to stop collecting further data.

Table 1: Overview of WP1b data collection

Activity	Per CH	Per recruitment hub (n=3)	Whole sample total (n=9)
General observations	Up to 12 hours over a period of 2-3 weeks	Up to 36 hours	Up to 108 hours
Focussed observations of up to 6 CH staff	Up to 24 hours (4 hours per staff member over 4 weeks)	Up to 72 hours	Up to 216 hours
Interviews	Up to 10 (8 frontline care staff, 2 managers)	Up to 30	Up to 90
Documentary analysis	Any training and workforce development related documentation		

Observations

These will cover day and night times, weekdays and weekends to ensure the experiences of night staff are included. Research indicates resident experiences differ across these times (50). Notes will be handwritten in anonymised/pseudo-anonymised fieldnote diaries and then written up into fuller electronic fieldnotes and stored securely on university cloud storage.

Initial *general observations* of up to 12-hours per CH, will familiarise researchers with staff, residents and the CH learning environment, including training activities and opportunities for informal and incidental learning, at a general, anonymous level. They will take place over a 2-3 week period, in communal and public spaces, training rooms and offices and in bedrooms during non-intimate/personal care e.g. offering drinks and meals, waking residents up. Formal training (including induction) will be observed when occurring. General observations will help to finalise details for focussed observations including confirming relevant areas of care practice (see b) below, and to identify staff to approach for participation.

Focussed observations of up to 24-hours per CH will focus on

a) informal staff induction and other learning opportunities (e.g. shadowing, mentoring, supervision)

b) care practices that require specific skills/knowledge acquired through mandatory and non-mandatory training (mealtimes, personal care, hoisting/transfers, activity provision, supporting distress).

The researcher will follow individual staff members to explore staff practices that influence learning and to understand concurrent informal and incidental learning (e.g. through interactions with/feedback from peers, residents, trial and error etc). Up to six staff members per CH will be consented and the researcher will accompany them for periods of time over different shifts and times of day when induction or specified care practices are taking place (4-6 hours per staff member over a 4-week period). As the focus is on the learning processes of the consented staff member, no personal details or identifying information will be recorded of residents or other staff they interact with.

One concern directed at observational research is that the presence of an observer may alter the behaviour of those observed, in favour of behaviours perceived to be socially desirable(51). In our experience in multiple observational studies in busy health and social care environments, staff relatively quickly get used to the presence of the researcher over the extended time they are present. Researchers will minimise their impact by making introductions and establishing rapport, before conducting observations or conversations for research data, they will be sensitive to the fact this is a home and workplace and use reflexivity to consider their impact(52) during observations. The use of general observations and introductory and consent visits to the CH will provide time for this familiarisation to commence ahead of observations. The study is interested in the *process* of learning rather than what staff have learnt, and observation provides only one of multiple data sources within this study to understand this phenomenon.

Informal conversations

Will take place during or immediately after focussed observations with

1) staff to explore how they acquire their practice knowledge and skills and what influences how they practice
2) residents who have consented to observations of their personal care, to explore if and how they feel they influence staff practices and any barriers and facilitators to this.

These will be recorded via researcher fieldnotes.

Semi-structured individual/small group interviews

Will be conducted with up to 10 staff per CH (c.8 frontline, c.2 managerial) (length approx. 30-45 mins per interview). These will be in-person, on-line or via telephone based on staff preference. Interviews will explore how staff learn (including exploring informal, incidental and formal learning) and how wider learning environment components influence their practice. Interviews will be audio recorded (or video recorded if online) and transcribed verbatim. Staff will have the choice to participate in focussed observations and informal conversations, an interview, or both. Staff who participate in interviews or focussed observations will be offered a £20 shopping voucher as a thank you for their time.

Interview and observation guides are underpinned by the LtC model and CFIR and have been developed, and will be further refined, through co-development with the study lived experience and staff advisory groups and as data collection evolves. Interview guides will be piloted ahead of formal data collection to also inform refinements.

If feasible, we will also conduct up to 3 interviews with managers/senior staff working in homes rated by CQC as inadequate to sense check the developing LtC model against the experiences of these homes, given they are not included in fieldwork for reasons explained above. These will be identified through our existing networks and co-applicant teams and approached to take part via initial e-mail either direct from the researcher or via a gatekeeper e.g. member of the research team or one of their networks.

Documentary analysis

We will analyse relevant informal and formal training documentation (e.g. induction materials and records, training courses attended, mentorship and supervision processes and records (blank and from consented staff taking part in focussed observations), etc).

Piloting of measures for WP3

In WP3 we propose to include a range of quantitative staff measures as part of a mixed-method case study design. We will pilot these with staff in WP1b to explore completion rates, appropriateness and acceptability.

3.3.7 Data Analysis

We will conduct a within- followed by cross-case data analysis based on processes outlined by Creswell (53) and Yin (54) and underpinned by the CFIR and LtC model. This will include:

1. Analysis of each data source using template variant of thematic analysis(55), using *a priori* deductive (based on CFIR and LtC model constructs) and inductive coding (to identify unique codes and develop themes derived from the data). Following familiarisation with the whole dataset we will develop an initial coding template based upon code development and clustering these into categories or themes, developed through detailed reading and discussion of a sample of 6-8 transcripts or sets of field notes, selected for good representation of key issues found across the full dataset. The template will then be applied to coding a further 3-4 transcripts with potential new codes discussed as a team ahead of modification of the template. This iterative process is followed until there are no substantial sections of data unable to be coded with the template. The template is then applied to the whole dataset.

2. Integration of the data by case/CH, to produce case studies describing the learning environment and drawing out factors that influence staff learning and practice in each case. In addition, we will draw out barriers and facilitators to: learning and its implementation; optimal conditions for each LtC model component and any additional components identified through analysis.

3. Comparison across cases to describe common and unique patterns, following Yin's (54) approaches of

   a) categorisation,
   b) analytic and interpretive tabulation to organise combined findings,
   c) application of similarity and contrast analysis approaches. For example, we will compare practice knowledge and skills acquisition in the areas of focus (mealtimes, personal care, hoisting/transfers, activity provision, supporting distress) and factors influencing these practices across case sites to understand how different learning environment components influence learning and practice at different sites, identifying commonalities and differences.

Integration Of Findings

Findings from the systematic reviews will be integrated with the ethnographic case study data using a data integration approach of 'following a thread',(56, 57) which supports thematic integration of different qualitative data sources. This will define

i) what an effective CH learning environment for producing person-centred care looks like,
ii) the factors within the LtC model that influence learning, and
iii) barriers and facilitators, both to effective learning in CH environments more broadly and to the successful implementation of components of the LtC model.

A workshop with co-applicants, members of the two advisory groups, the Steering Group and other key stakeholders (including a manager/senior staff member of a CH rated inadequate) (see Gantt chart) will support interpretation of the combined findings and develop and refine the LtC model and its associated logic model.

3.4 WP2: Co-design of the LtC Implementation toolkit (Leads Taylor and Mikelyte supported by Surr)

3.4.1 Aim

To co-design a LtC implementation toolkit to support effective learning environments in CHs.

3.4.2 Methods

Co-design workshops drawing on the principles of Experience-Based Co-Design (EBCD) (58), an approach we (NT/CS/RK) have already used successfully in studies involving health and care staff and with people with dementia, will be utilised (39, 59).

3.4.3 Sampling and recruitment

Based on our previous experience of co-design, group management and methods for bringing together the views of diverse participants from across geographical locations, three stakeholder groups of purposefully sampled diverse CH staff (n=6-8), residents (n=3-5) and family supporters (n=4-6), will be recruited per locality (Leeds/West Yorkshire, Kent/East London and Bournemouth/the South West). Alongside this, will be a single national group of 5-6 operational staff working in senior roles in CH provider groups (e.g. owners, training or quality leads). In all groups we will seek to recruit participants who are diverse across a range of characteristics including ethnicity, gender, socio-economic status and age. We will identify and approach participants via our existing local and national networks, the CHs who participated in WP1b and the care provider groups represented by our co-applicants (Hallmark Care Homes and HC-One). It is likely resident groups in each locality will be comprised of residents from a single CH due to the logistics and challenges that would be associated with travel to another venue for many residents.

Residents

Inclusion criteria

- Is a permanent resident of a care home for older adults in England
- Has the cognitive and communication abilities to participate in an inclusive small group workshop and contribute meaningfully to the co-design process with reasonable adjustments/support/interpretation as required
- Is willing to attend at least one co-design workshop
- Residing in a CH willing to support the resident to participate in the co-design process e.g. with providing space for meetings and support for residents to attend

Exclusion criteria

- Lacks capacity to give informed consent and has no-one willing/able to act as a consultee to provide advice on their wishes

- Is a respite or other temporary resident in a care home
- Is considered by the care home manager to be too unwell to participate or to have other ongoing personal circumstances that would make them unsuitable for participation

Relatives/supporters

Inclusion criteria

- Is the relative/carer/supporter of someone currently or who was previously residing as a permanent resident in a care home for older adults in England
- Is able to attend and participate in a minimum of two face-to-face or online workshops and contribute meaningfully to the co-design process with reasonable adjustments/support/interpretation as required

Exclusion criteria

- Is recently bereaved (in the last 3-months)
- Lacks capacity to give informed consent

Staff

Inclusion criteria

- Is a member of permanent or bank staff currently working in a management, direct care or training/development role in a care home in England
- Has the permission of their employer to attend co-design workshops during working hours OR is willing to attend outside of working hours
- Is willing to attend at least two co-design workshops

Exclusion criteria

- Is a member of agency staff, a student or a volunteer working in a care home

We will establish individual support needs, communication preferences and how they would like to engage in group meetings with each participant when they consent, devising tailored plans to best meet individual needs. We have costed for translation of participant information/consent materials to other languages and interpreter time, to support inclusion of people for whom English is not their first language. Methods for inclusion, engagement and support will be continually monitored and adapted as the co-design process progresses. The adapted NIHR impact log(60) will be used to evaluate the co-design process and as means of feeding back about the impact of their input.

3.4.4 LtC Implementation Toolkit co-design process

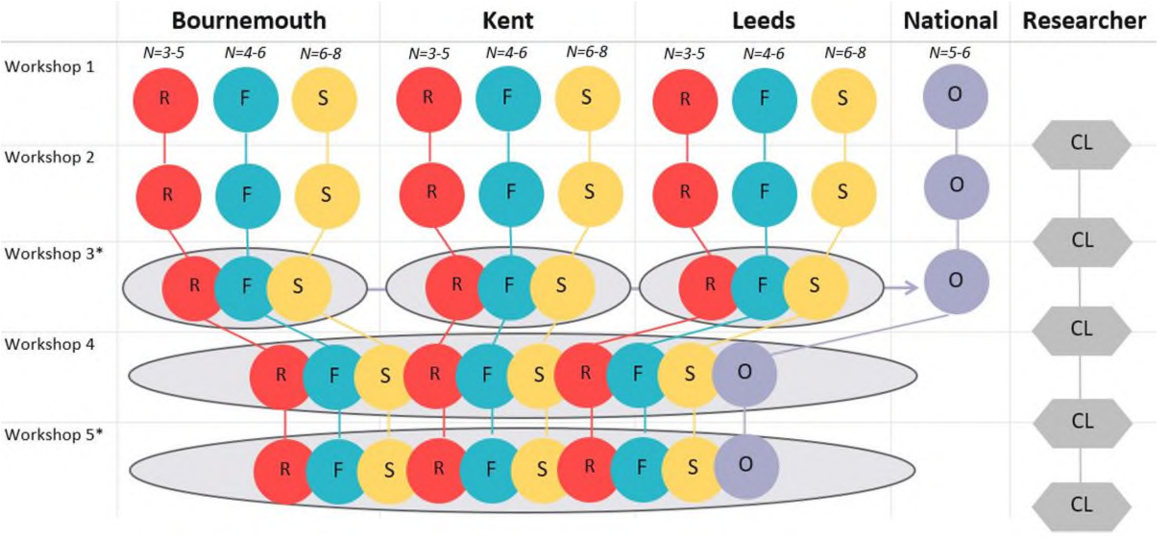
Toolkits bridge the knowledge translation gap and support the uptake of evidence to impact practice change and improve care outcomes(61, 62). They are a collection of resources which are customisable to context and can be used to plan change, and support adoption and sustainability of implementation(63). Toolkit development will follow KAF *knowledge creation* and *action* cycle phases. This will involve a cyclical approach of co-design workshops with intervention development and refinement between these by the research team, based on learning and priority setting from the workshops. It will draw on evidence-based recommendations for the development, design and content of quality improvement toolkits(64).

At each locality staff, resident and family groups will meet separately (workshops 1 & 2) to ensure opportunities for trust building, open discussion and for all voices to be heard. A joint workshop at each site (workshop 3) and workshops involving a sample of members from all 3 sites (workshops 4 & 5) will refine and agree the final toolkit (figure 3). Workshops 1-3 will be held in-person for residents, families and staff, and online for the national operational group. Workshops 4 and 5 will be held online due to including members from across the three geographical locations. Workshops will last around 1.5-2 hours including breaks.

Methods used within workshops will be flexible to inclusively meet individual needs(65) and tailored to group participants. They will include visual and creative methods such as problem tree analysis, collage and use of visual images. We will ensure regular communication with groups and provision of accessible summaries of discussions between meetings. Additional individual follow-up meetings or support between workshops will facilitate ongoing engagement. While the exact workshop content will be designed in consultation with the advisory groups and the co-design groups themselves, the general content of each workshop will be as follows:

- *Workshop 1* will explain the study, co-design process, what we want to achieve, offer opportunities for members to get to know each other, build trust, and agree how they want to work together.
- *Workshop 2* will review Phase 1 findings using ‘Trigger materials’ in the form of artist-created storyboards summarising key findings and case studies. It will identify priorities and suggest initial toolkit components.
- *Workshop 3* will share the discussions and priorities from the three local stakeholder groups and decide on priorities for the toolkit to take to workshops 4 and 5.
- *Workshops 4 and 5* will review initial drafts of the toolkit guided by the APEASE (Acceptability, Effectiveness, Affordability, Side-effects or unintended effects, Equity) intervention ideas evaluation criteria(66).

Workshop participants will be recompensed for their time at £50 per workshop plus travel costs.



R – resident; **F** - family or friend supporter/carer; **S** – care staff; **O** – operational staff working in senior roles in CH provider groups; **CL –** Co-Design Leads from Bournemouth, Kent and Leeds meet to discuss meeting outcomes and coordinate subsequent meetings.

26 meetings in total (not including ones between researchers only), ranging from small group to all areas joined-up. This approach will ensure a greater equity of participation and representation, time to build trust and enable rich, cooperative co-design.

*additional meetings may be needed if (a) any of the above objectives take longer than expected and (b) to share the co-designed toolkit for further review and refinement. We have budgeted for 2 additional meeting.

Figure 3: Summary of co-design workshops

The toolkit content will primarily be based on WP1 findings, prioritised by residents, relatives and care staff involved in WP2, using knowledge translation to ensure that the content, format and interface of the toolkit is optimally designed to suit users. While allowing the co-design process to determine the final toolkit, we anticipate it will include an audit tool of current practice, methods for identifying and prioritising areas for development, template implementation plans, and resources to help implement learning environment improvements in the areas of focus. The toolkit content will aim to be specific enough that its implementers find it easy to put into practice, but not overly prescriptive, so it can fit the diverse contexts and settings of different care homes and staff. The format of the toolkit and its resources will be determined by the co-design process based on what is felt to be most accessible and usable.

We will produce an easy read summary of the co-design process and findings for all co-design participants. We will also retain contact details of participants who wish to receive a final summary of the study findings.

3.5 WP3: Evaluation of the LtC toolkit (Leads Parveen and N Smith)

3.5.1 Aims

To evaluate

a) how the LtC toolkit can be used to provide effective learning environments in CHs
b) the impact on staff and CH practice
c) barriers and facilitators to implementation
d) the costs/consequences of implementation and to
e) refine and adapt the toolkit for wider implementation.

3.5.2 Design

A collective mixed-methods (qualitative and quantitative) longitudinal case study of LtC toolkit implementation and evaluation over 6-months underpinned by the CFIR.

3.5.3 Sampling

To implement and evaluate the impact of the LtC toolkit we will recruit four CHs (Yorkshire n=2 and Kent/London n=2). To support transferability of findings and national learning we will use information-oriented sampling (67) and in-depth case studies. This case study sampling approach maximises the utility of information through selecting cases on the basis of expectations about information content. This can include maximum variation (cases that are very different on one key dimension) and critical cases (if something is, or is not, valid in the chosen case then that finding likely applies to all other similar cases). Sampling will consider type of home (nursing/residential and dementia specialism), ownership (single owner/group/profit/not-for-profit), size (min CH size will be needed to meet staff survey sample sizes), and CQC rating (as in WP1b we will not recruit CHs rated inadequate). Other criteria for maximum variation or crucial cases may become apparent during WP1b. The lived experience and staff advisory groups will input into sampling and CH selection.

Sampling and inclusion/exclusion criteria will be as per WP1b.

3.5.4 Recruitment and consent

Care homes

We will include 1-2 CHs from phase 1 should they wish to continue participation and recruit 2-3 new CHs (n=4 total). New CHs will be recruited via previously successful methods outlined in

WP1b, targeted to recruitment of homes with the required sampling characteristics. CH consent will be gained from the owner/manager prior to study commencement.

Staff

Consent processes and documentation for observations will follow those detailed in WP1b. Eligible staff will be identified and approached initially by the CH manager or another senior staff member, ahead of formal consent. Verbal consent will be gained from staff who are present during general observations. Formal written consent will be taken for staff who participate in focussed observations and semi-structured interviews.

Residents

Consent processes and documentation for residents will follow those detailed in WP1b. Verbal agreement will be sought for observations except the observation of personal care where we will seek, in advance, formal consent from a resident or advice from a consultee where a resident lacks capacity.

A process consent approach(48) for staff and residents will be adopted of verbally rechecking consent at each data collection point. Posters, easy read information leaflets and verbal explanations from researchers or staff members will notify residents, staff members and visitors about observations in advance, with the option to opt out. Should a researcher's presence appear to be causing a resident distress they will immediately stop and follow pre-agreed distress protocols.

3.5.5 Toolkit Implementation

The co-design process will develop toolkit content to guide evidence-based implementation for use by CHs. While allowing for the Phase 1 and 2 findings to inform implementation, these will be based on the Knowledge to Action Framework action cycle (see fig 2) and will draw on evidence of optimal toolkit implementation(62). We will employ our own previously successful methods(59) of convening an implementation leadership group (manager, senior staff and key 'champions') in each CH who will lead implementation. A researcher will support(68) the leadership group to apply the LtC toolkit in practice and then to plan and lead change in the learning environment. This will likely include auditing current practice, identifying priority areas for change, developing a tailored implementation plan, identifying potential implementation barriers and facilitators and responses to these, and identifying anticipated outcomes of changes that will be made. Implementation leadership will also include ongoing implementation monitoring, including 'trouble-shooting', reassessing barriers and facilitators to implementation and associated review and updating of the implementation plan.

3.5.6 Data Collection

Will include observations, interviews, documentary analysis and quantitative measures (staff measures, researcher observed measures and routine data). Underpinned by the CFIR it will explore the following implementation factors focussing on if and how the learning environment changes over time and the impact of this on staff learning and care delivery:

- The innovation aspects (the LtC toolkit) and its implementation (using the TIDieR checklist criteria (69)),
- outer setting (wider contextual factors and external pressures)
- inner setting (care home structural, relational, communication, cultural, resource etc characteristics)

- individuals (roles and characteristics of implementors and recipients and their capability, opportunity and motivation to implement) and
- implementation processes (activities and strategies to implement the LtC toolkit),

Data will be collected 1-month prior to implementation (T0) and in months 3 (T1) and 6 (T2) of implementation. Table 2 summarises data collection.

Activity	Per CH T0	Per CH T1	Per CH T2
General observations	Up to 6 hours over 2 weeks	Up to 6 hours over 2 weeks	Up to 6 hours over 2 weeks
Focussed observations of up to 6 CH staff	Up to 24 hours (4 hours per staff member over 2-3 weeks)	Up to 24 hours (4 hours per staff member over 2-3 weeks)	Up to 24 hours (4 hours per staff member over 2-3 weeks)
Semi-structured interviews		Up to 8 direct care staff	Up to 8 direct care staff
Focus groups with the implementation team		1 x 1 hour	1 x 1 hour
Documentary analysis	Any training and workforce development related resources, materials and documentation.	Any training and workforce development related resources, materials and documentation. Intervention implementation plans and documentation	Any training and workforce development related resources, materials and documentation. Intervention implementation plans and documentation
Staff measures	Questionnaire to at least n=23	Repeat questionnaire to T0 sample	Repeat questionnaire to T0 sample
Researcher observed measure	Dignity domain of ASCOT CH	Dignity domain of ASCOT CH	Dignity domain of ASCOT CH
Routine data	Staff sickness, turnover and agency use for prior 3-m	Staff sickness, turnover and agency use since T0	Staff sickness, turnover and agency use since T1

Process of toolkit implementation

We will collect data on the process of toolkit implementation through methods including observations of intervention leadership group meetings, informal conversations with intervention leadership team members and review of documentation relating to implementation. We will conduct one focus group per CH with the intervention leadership team at T1 and T2 exploring implementation experiences and usefulness of the LtC toolkit, contextual factors impacting implementation, perceptions of learning environment changes, and perceived impacts of this on staff learning, practices and care quality. In this way we will build up a picture of the type and frequency of activity and what roles different staff members take on in relation to toolkit implementation each CH.

Observations

Will take place in each CH at T0, T1 and T2 of up to 30 hours per time point and associated *informal conversations* (both recorded as described in WP1b) and will explore changes over time in:

- the learning environment and learning opportunities;
- planned areas for change;
- focussed areas of skilled practice (as in WP1b);
- how staff have learned to deliver care and
- what influences this.

Data will be recorded via researcher fieldnotes, and observations will cover day and night times and weekdays and weekends to ensure reach of night staff as one of the under-represented groups.

General observations of up to 6-hours per CH per time point, will familiarise researchers with staff and typical CH routines at a general, anonymous level (T0), and will explore opportunities for informal and incidental learning and observe formal training when occurring. They will take place in public spaces (lounge, dining room etc), training rooms and offices and in bedrooms during non-personal or non-intimate care (e.g. offering drinks and meals, waking residents up). General observations at T1 and T2 will focus on changes in the general formal and informal learning opportunities from earlier time points and if and how these impact on practice.

Focussed observations of approximately 24-hours across up to 6 staff per CH, per time point, will focus on looking for any changes over time in

- staff induction and other informal learning opportunities (e.g. shadowing, mentoring, supervision) and
- care practices that require specific skills/knowledge acquired through mandatory and non-mandatory training (mealtimes, personal care, hoisting/transfers, activity provision, supporting distress).

They will explore in-depth what staff do and concurrent informal and incidental learning (e.g. through interactions with/feedback from peers, residents, trial and error etc). Up to six staff members will be consented and the researcher will accompany them for periods of time over different times and days of the week when learning activities or care in the specific areas of practice are taking place. Researchers will observe 4-6 hours per staff member over a 2-3 week period. Consent processes and considerations for observations are as WP1b.

Semi-structured individual or small group interviews

We will conduct interviews at time points T1 and T2 with up to 8 staff per CH exploring their perceptions of how they learn, the learning environment and learning opportunities in the CH and any changes to this, and the influences of the learning environment on care practices and care quality and any changes to this. Interviews will ask about experiences of using the toolkit and any barriers and facilitators to implementation.

Interview and observation guides will be underpinned by the LtC model and CFIR and co-developed with the advisory groups, to be attentive to EDI principles. Staff who participate in an interview/focus group or focussed observations will be offered a £20 shopping voucher as a thank you for their time.

Documentary analysis

We will conduct document analysis of relevant informal and formal training documentation (e.g. induction and other training resources, materials and records, training courses attended, mentorship and supervision processes and records etc). It will compare documentation from T0 to that from T1 and T2 to assess for changes over time in the types of training and learning/development offered, to whom and how frequently, its content and how it is recorded. For example, a CH may decide to establish regular mentoring sessions for staff and document these in training records, or they may adapt induction and shadowing processes for new staff.

Measures of staff and practice related outcomes

These will be collected at T0, T1 and T2 in each CH to examine change over time. Outcomes will be assessed via staff completed measures (piloted and refined in WP1b) available in digital and paper-based formats, with all permanent and bank members of staff invited to take part. Staff will be asked to provide their name on the survey to support linking of data from T0, T1 and T2. This will be removed once data has been linked, ahead of analysis. To maximise response rates, at each time point, all staff who complete a survey will be offered a £10 shopping voucher as a thank you for their time.

- *Demographics* including role, age, sex, time in post, ethnicity, English as first language status

- *CH learning culture* will be assessed using the Supportive Learning Environment Scale of the Short-Form Learning Organisation Survey (LOS-27) a 27-item, 7-factor measure(70).

- *Person-centred care* will be assessed using the Person-Centred Care Assessment Tool (P-CAT) (71) a 13-item measure of the extent to which CH staff rate their workplace to be person-centred. It has good psychometric properties.

- *Job satisfaction* will be assessed using the Measure of Job Satisfaction (MJS) a five-factor and 22-item measure with acceptable psychometrics that has been developed in long-term care settings (72).

- Intention to leave role will be assessed using a commonly used in health and care research single question with a yes/no response (73).

- *Perceived ability to put learning into practice* will be assessed using the Barriers and Facilitators Questionnaire (74), a 30-item measure based on the Theoretical Domains Framework, with acceptable psychometric properties, that assesses perceived barriers and facilities to implementation of training or interventions.

- *Work-related quality of life* (WRQoL) will be assessed using the ASCOT-workforce, a newly developed 13 item tool specifically designed to assess WRQoL in the social care workforce. During its development it was completed by over 7,000 care workers in the Adult Social Care Workforce Survey(75).

- *Health-related quality of life* will be assessed using the EQ-5D-5L(76).

An a priori sample size calculation for a repeated measures ANOVA (i.e. assessing the effect of the toolkit implementation over time) based on the assumption of a medium effect size 0.20. type I error probability .05, type II error probability .95, number of groups as 4 (care home sites) and 3 measurements over time indicates that a sample size of n=92 (23 per site) is sufficient to detect a main effect of the toolkit on learning climate and detect on interaction of CH site. The assumed effect size was predicted on published literature on learning climate and social informal learning(70).

Observation of practice

Researchers will also complete the 'dignity domain' of the ASCOT CH(77), with observations for this undertaken alongside the general CH observations. This will provide data on how staff treat residents. It will be competed at T0, 1 and 2.

Routine data

We will collect *relevant routine CH data on CH level outcomes* (staff sickness and turnover rates, average hourly rates of pay, use of agency staff) over the period 3-months prior to T0 and then during implementation at T1 and T2.

3.5.7 Economics

We will conduct a cost-consequence analysis (CCA) of the LtC implementation toolkit(78). CCAs are recommended for complex interventions that can have multiple effects, which are difficult to measure in a common unit and incorporated into an index measure. CCAs are not restricted to any viewpoint and outcomes are measured in their natural units to allow decision-makers to form their own opinion on relevance and relative importance to their decision context(79). The outcomes will be the quantitative measures (both staff and CH level) described above including work-related quality of life (ASCOT-workforce), job satisfaction (MSJ), health-related quality of life (EQ-5D-5L), person-centre care (P-CAT) and care home learning culture (LOS-27) and will be measured at T0, T1 and T2. All toolkit implementation costs will be measured. They include development costs (e.g., materials), implementation costs (e.g., trainer time) and ongoing costs (e.g., staff time). Trainer and staff time, measured using questionnaires and records, will be costed using national tariffs(80, 81) and aggregated over time.

Outcome and cost data from questionnaires and records will be analysed using STATA 18. We will estimate the average change in outcomes and costs between T0, T1 and T2 and 95% confidence intervals. Results will be presented in a descriptive table, which will present the effectiveness results (of the outcomes described above) in a disaggregated format, together with the estimates of the mean costs and confidence intervals associated with the LtC toolkit. Results from the CCA will be presented both for the pooled sample (across all care homes), to understand average changes and increase sample size, and for each care home. The latter will provide evidence of (any) dispersion in costs/consequences between care homes and an initial understanding of potential variation in the impact by care home characteristics. We will report both the consequence of the intervention in terms of changes in turnover rates and staff sickness, as well as considering the change in costs associated with these, both separately and when considering the total cost of the intervention, if this cost data is made available by CH providers. If this data is not available, we would look to estimate these costs via other data sources, if possible. This would limit the confidence we could attach to these findings.

We will explore the feasibility of conducting a future Return on Investment (ROI) analysis including the availability of profitability and revenue data and its suitability for economic analysis in a potential future study.

3.5.8 Data Analysis

To explore implementation of the LtC toolkit and its impacts on the learning environment, its components and staff practices, we will conduct a within followed by cross-case data analysis based on processes outlined by Creswell (53) and Yin (54) and underpinned by the CFIR using the following steps:

1. Analysis of individual data sources

   Qualitative data will be analysed using template variant of thematic analysis(55), using *a priori* deductive (based on CFIR constructs) and inductive coding (to identify unique codes and develop themes derived from the data). Following familiarisation with the whole dataset we will develop an initial coding template based upon code development and clustering into categories or themes, developed through detailed reading and discussion of a sample of 6-8 transcripts selected for good representation of key issues found across the full dataset. The template will then be applied to coding a further 3-4 transcripts with potential new codes discussed as a team ahead of modification of the template. This iterative process is followed until there are no substantial sections of data unable to be coded with the template. The template is then applied to the whole dataset.

   Quantitative data will be analysed using SPSS version 27. A four (site) by three (time point) repeated measures ANOVA will be used to explore the main effect of the toolkit on the key outcome of learning climate, as well as person centred care, work related quality of life and job satisfaction.

2. Integration of data by CH, to produce in-depth, longitudinal case studies, based on evaluation against the learning environment logic model developed/refined in WP1 (see figure 3 for draft logic model). As per Yin's analytic approach it will explore data that addresses each component of the logic model and the evidence on the transitions between these (e.g. activities to outputs; outputs to outcomes) in the context of the contextual conditions. This will allow exploration of the logic model for the LtC toolkit and its processes in each case study site.

3. Comparison across cases to describe common and unique patterns to compare implementation, impacts and barriers and facilitators. This will follow Yin's (54) approaches of categorisation and analytic and interpretive tabulation to organise combined findings, and application of similarity and contrast analysis approaches. For example, we will compare practice knowledge and skills acquisition in the areas of focus (mealtimes, personal care, hoisting/transfers, activity provision, supporting distress) and factors influencing these practices across case sites to understand how different learning environment components influence learning and practicing these skills over time in different CHs including commonalities and differences. How individual cases replicate or contrast with each other in terms of LtC toolkit implementation and barriers and facilitators to this will be explored. Potential effects of differences in LtC toolkit implementation and contextual factors on outcomes and impacts (as per the logic model) will be explored.

4. We will hold an in-person, full-day workshop with the research team and advisory groups plus other key stakeholders, including, if feasible a manager/senior staff member from a CH rated by CQC as inadequate, to review findings, draw out key recommendations and to make decisions about final revisions and refinements to the toolkit.

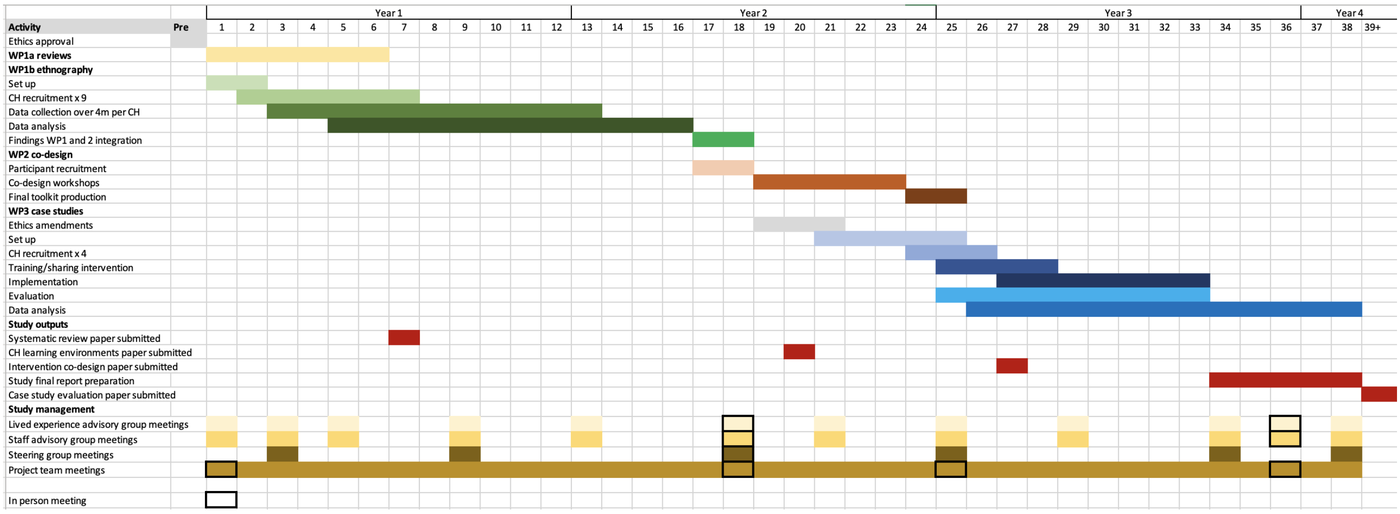
4. Dissemination, outputs and anticipated impact

The study dissemination plan will be co-developed with our advisory groups, with input from the steering group and WP2 co-design participants, and will be refined throughout the study. However, it will include but will not be limited to the following outputs and methods for dissemination.

- The main output of the study will be an evidence-based, co-designed, scalable LtC model, LtC implementation toolkit and guidelines for use, made freely available via the study web-site and disseminated widely for immediate uptake by the sector.
- A refined LtC model of an effective CH learning environment, a refined logic model for LtC model implementation, evidence of potential barriers and facilitators to implementation of the LtC model and its components
- accessible study outputs summarising findings made available via a range of methods tailored to the audience;
- academic publications

5. Project/research timetable

The project timetable including key milestones and outputs is provided in the Gantt chart below



6. Project management

As co-Chief Investigators (CIs) CS and IL will be responsible for project and budget management and for the ethical and scientific rigor of the study, supported by the other senior investigators. The full project team will meet monthly to ensure effective project oversight, with WPs teams meeting weekly/fortnightly. Informal contact between the CI, WPs leads and researchers will be maintained by e-mail and ad-hoc meetings as required. Advisory and steering group meetings will be held as per the Gantt chart. The Steering group will have 8 independent members (with SFC already agreeing representation on this group) and attendance by the CIs, WP leads and researchers. It will review progress and the achievement of project milestones, as well as providing ad hoc advice as required. We will submit interim progress reports to NIHR as required.

7. Ethical issues and safeguarding

Ethical approval for the study has been granted by Wales REC 6 on 19.9.25.

Ethical issues associated with recruitment, consent and data collection have been discussed in the methods sections. We are experienced in recruiting and working with vulnerable adults in research. All researchers will be trained to assess capacity to give informed consent in line with the Mental Capacity Act (82) and where a resident lacks capacity a personal or nominated consultee will be appointed to provide advice on their wishes and process consent will be followed. All data will be managed in line with data management legislation, and we will develop a Data Management Plan and Data Protection Impact Assessment as part of ethical approvals. We will develop a distress protocol to be employed should CH residents or staff become distressed during observations or interviews. Protocols for reporting practices that raise safeguarding concerns will be developed and agreed with each CH ahead of study commencement. The site lead for each recruitment hub (Surr, Murphy, N Smith) will line manage the researcher at their site and will be available should a researcher experience a distressing event or wish to debrief/discuss their experiences following a site visit. We will ensure another senior member of staff from the team is available to cover should one of the site hubs be unavailable. Study participants will be informed that information they share will be kept confidential except where information shared indicates they or others may be at risk of harm. In such cases this will be discussed with the Chief Investigators and the University/CH/Local Authority safeguarding protocols will be followed as necessary.

8. Input from people with lived experience and care home staff

Lived Experience (CH residents and family/supporters) and Stakeholder Involvement (care home staff and provider organisations) is central to our study. We have significant expertise in conducting effective and inclusive lived experience and stakeholder involvement work (also known as Patient and Public Involvement (PPI) work). Our involvement work is led by Taylor who has extensive experience in this area as an arts practitioner working with older people including those with dementia and as an academic facilitating research involvement work.

Involvement underpins all aspects of project delivery and management:

- We will establish two advisory groups (distinct from WP2) to provide guidance to us at key stages in the study
  - A lived experience group of eight members in addition to LS and JP, including care home residents, and carers/supporters of residents.
  - A staff group of five CH staff, led by IL and supported by NT
- LS and JP (lived experience co-applicants) will be members of the project management group and will co-lead the lived experience group with NT.

Each group is costed to meet 12 times during the study period, with 2x meetings planned in person and 10x on-line. Flexibility for meeting mode will be needed, particularly to ensure accessibility for CH residents. We may hold smaller in-person resident only meetings to feed into the lived experience group, or speak with residents individually. We will establish the preferred method for engagement of each member at the point of recruitment. Members will be recruited from our existing networks including the Leeds Beckett Centre for Dementia Research’s group of around 50 diverse members and via NCF, Hallmark, NICHE Leeds and HC-One. On joining the group each member will have an informal discussion with NT/IL about their interests, expertise and any support needs so that involvement approaches can be tailored to individual need. Capacity building activities will be offered to advisory group members such as brief research methods training. Costs have been provided for them to attend development opportunities should they wish.

The advisory groups will undertake a range of activities including reviewing and inputting to the content and design of study documentation, providing advice on study management and delivery, inputting into data analysis and interpretation, co-developing dissemination plans and co-writing and presenting study outputs.

During early meetings group members will get to know each other and will agree a timetable for forthcoming meetings, and how they would like to input into the research. These plans will be regularly reviewed and updated. 1-2 members of each advisory group will be invited to attend project team meetings at appropriate time points to feed information into and out of the advisory group.

We have costed meeting attendance and other involvement time at NIHR rates and include payments for time and out of pocket expenses.

Involvement methods will be individualised, will build on our established approaches used over a number of years on similar projects and will follow best practice associated with public involvement in research including NIHR guidance and the Dementia Enquirers Gold Standards for Ethical Research(83).

We will include regular opportunities for advisory group members to feedback informally on how methods are working and anything that could be improved. We will also keep a clear written record of the ways the advisory groups have shaped and impacted the research.

9. End of study

The end of study is when the final piece of data has been collected in WP3.

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