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QUALITATIVE PAPER

How quality improvement collaboratives work to improve healthcare in care homes: a realist evaluation

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Abstract

Background: Quality improvement collaboratives (QICs) bring together multidisciplinary teams in a structured process to improve care quality. How QICs can be used to support healthcare improvement in care homes is not fully understood.

Methods: A realist evaluation to develop and test a programme theory of how QICs work to improve healthcare in care homes. A multiple case study design considered implementation across 4 sites and 29 care homes. Observations, interviews and focus groups captured contexts and mechanisms operating within QICs. Data analysis classified emerging themes using context-mechanism-outcome configurations to explain how NHS and care home staff work together to design and implement improvement.

Results: QICs will be able to implement and iterate improvements in care homes where they have a broad and easily understandable remit; recruit staff with established partnership working between the NHS and care homes; use strategies to build relationships and minimise hierarchy; protect and pay for staff time; enable staff to implement improvements aligned with existing work; help members develop plans in manageable chunks through QI coaching; encourage QIC members to recruit multidisciplinary support through existing networks; facilitate meetings in care homes and use shared learning events to build multidisciplinary interventions stepwise. Teams did not use measurement for change, citing difficulties integrating this into pre-existing and QI-related workload.

Conclusions: These findings outline what needs to be in place for health and social care staff to work together to effect change. Further research needs to consider ways to work alongside staff to incorporate measurement for change into QI.

Keywords: nursing homes, quality improvement, quality improvement collaboratives, health services research, primary care, older people

Key Points

- QICs bring staff from different organisations together to improve healthcare in care homes.
- Healthcare improvement should align with existing work priorities and be led by staff with experience of collaboration.
- Care home staff can lead healthcare improvement if approaches and structures are adopted, which enable them to do so.
- GPs were keen to be involved in care home improvement collaboratives but did not have capacity to lead.
- CGA is unfamiliar to many community staff working in improvement and may cause confusion.

Introduction

In England, approximately 410,000 older people live with dementia and/or frailty in care homes which provide 24-hour care with, or without, on-site nursing [1]. Health services to care homes are associated with better outcomes if they have a focus and activities that legitimise ongoing contact between healthcare and care homes at an institutional level, where they link with a wider system of healthcare, and when they provide access to dementia-specific expertise [2]. There is uncertainty, both in the UK and internationally [3,4], around how to implement evidence-based approaches to care in care homes, given the tensions between the quality of care (often involving multiple external inputs from expert healthcare professionals) and quality of life (involving client-led, asset-based and person-centred care in a homely environment) [5].

When healthcare interventions are copied from primary care or hospitals and imposed on care homes without adaptation, then implementation will fail [6]. Quality improvement approaches enable adaptation of evidence-based interventions across multiple settings in a way that is context sensitive [7] and therefore have potential to overcome some barriers to implementation in care homes. Quality improvement collaboratives (QICs) bring together professionals from multiple sites to learn and apply improvement methods [8]. QICs vary in their delivery but generally comprise (i) focus on a specified topic, (ii) support by clinical and quality improvement experts, (iii) participation by multiple professionals across organisations and (iv) use of an improvement model (setting targets, collecting data and testing changes). A systematic review which collated the evidence for QICs in all healthcare settings from randomised controlled trials, non-randomised controlled clinical trials, controlled before–after studies and interrupted time-series studies with or without control site up till 2014 found 64 studies describing QICs found that 83% reported improvement in one or more effect measure [9]. Four studies were conducted in care homes and focused on falls [10,11], pressure ulcers [12] and pain-management [13]. Whilst positive outcomes were reported, less is understood about how the QIC intervention worked to improve care in care homes.

For those delivering and taking part in QICs, it is important to understand the patterns of working that deliver

change and improvements in care, with benefit to residents, relatives and staff. This study aimed to understand how QICs work when designing and implementing evidence-based approaches to healthcare in care homes.

Methods

A realist evaluation approach was used. A full protocol has been published [14]. This paper is compiled in line with RAMESES-II reporting standards for realist evaluations [15].

The QIC intervention was called Proactive HeAlthcare for Older People in Care Homes (PEACH). Table 1 provides a detailed description of the QIC using the template for intervention description and replication [16]. The QIC ran for 18 months (September 2016–February 2018) and comprised teams of health and social care professionals from four sites, each covered by a separate NHS Clinical Commissioning Group (CCG; the organisations responsible for commissioning healthcare in England). The research team established the QIC and provided advice on-site team composition and focus of intervention. We did not specify the interventions implemented by each site team. As these were a consequence of the intervention, rather than the intervention per se, they are reported in Table 2 under results.

Collaborative shared-learning events took place during months 1, 7, 13 and 18. Events comprised activities to build relationships, training on quality improvement and sessions to develop improvement plans and share progress between sites.

An appreciative approach [17] was used to maximise engagement, creativity, inclusivity and minimise effects of perceived hierarchy. The improvement team running the collaborative introduced the principles of Comprehensive Geriatric Assessment (CGA) as an evidence-based approach to holistic assessment and care of older people with frailty. CGA emphasises multidisciplinary, multidomain assessment and focussed around patient priorities. It has been shown to improve quality of care and patient outcomes in hospitals [18–20] but requires adaptation in care homes due to the need to negotiate and schedule interactions between multiple professionals and organisations [21].

Table 1. Description of the PEACH quality improvement collaborative

Name	PEACH collaborative
Why	The aim was to improve healthcare for care home residents. CGA was used as a framework to guide teams.
Where	Nottinghamshire (a county in the East Midlands region of England), UK. Collaborative shared learning events were carried out at a university location, and in-between events (action periods) teams met in local care homes, and at premises of local CCG (organisations which plan and purchase healthcare services) locations.
Who provided	The PEACH collaborative was delivered by an improvement team comprising a locally known clinical academic geriatrician, a nurse leader with expertise in appreciative methods to promote quality of life in care homes, a Health Foundation Quality Improvement Fellow and a researcher with interest in quality improvement science.
Recipients	In total, over the course of the QIC 44 participants attended at least one collaborative shared learning event. The job roles of all participants attending at least one collaborative shared learning event are described below: Site 1: commissioner, pharmacist, GP (X2), care home employed nurse, care home care assistant, NHS community matron, lay representative and a geriatrician. Site 2: commissioner (X2), Age UK representative, GPs (X3), falls specialist, care home manger, pharmacist and a dietician. Site 3: commissioner, care home vanguard manager (X2), matron nurse, care home nurse, geriatrician (X2), care home manager (X2), senior carer, integrated health and social care manager, dementia outreach manager and Age UK worker. Site 4: commissioner, matron nurse (X3), GP (X2), geriatrician, care home manager, social worker, pharmacist, Age UK and NHS care-coordinator
How	The collaborative-shared learning events were organised and hosted by the improvement team. Site teams met during action periods in their local areas, with a member of the improvement team was present to provide coaching at all meetings.
When and how much	A total of 18 months (September 2016–February 2018), with four collaborative shared learning events that took place approximately every 6 months).
What (materials and procedures)	Forming communities of practice: the collaborative took place across a region comprising four neighbouring geographical localities (sites), with a team formed in each site. In each site, the person responsible for planning and purchasing healthcare services (commonly referred to as 'commissioners' in the UK) for older people recruited a team. Teams were multidisciplinary (team configuration described above). Collaborative shared learning events: events included allocated time for teams to: <ul style="list-style-type: none"> • Discuss their local needs and priorities • Develop quality improvement plans • Present and share project ideas, and their experiences of the improvement journey (challenges, successes, lessons learnt and next steps). • Network Educational/learning sessions: the events included workshops with foci on: <ul style="list-style-type: none"> • Quality improvement techniques; setting SMART objectives, and testing change ideas using a Plan Do Study Act approach. • Getting to know each other as people (icebreaker exercises) • Helping participants feel safe (agreed ways of working) • Exploring attitudes and feelings (use of image cards) • Focussing on the positive (What works well and why? How do we want things to be? How can we work together to make this happen? What needs to be in place to make it happen more of the time?) • Communicating more effectively (celebrate, be curious, connect emotionally, consider other perspectives, collaborate, compromise and be courageous) • Capturing lessons learnt (takeaway messages—one thing learnt, want to think about more, wish to leave behind) • CGA and using this approach to care for older people. Action period group meetings: during action periods (the time in-between each shared learning event, approximately 5–6 months) teams met at their own site locations to review progress, and progress their improvement projects. Coaching: a Health Foundation trained quality improvement fellow provided coaching and mentoring to individual teams, both at shared learning events and also during the action periods. Signposting: when site teams faced challenges the improvement team helped by signposting to relevant contacts/resources. Newsletter: provided project updates (i.e. meeting dates) and team stories describing progress with quality improvement projects. Shared through email, with approximately three newsletters per year. Administrative support: the site teams were offered administration support during action periods, for example, arranging meetings and circulating meeting agendas/minutes. Support with data collection: the wider PEACH team included researchers dedicated to evaluating the activity of the QIC, collecting data around healthcare service use and care home resident well-being. Teams were offered support with data collection and quality improvement evaluation.
Tailoring	GPs and care home staff were provided with backfill payment for their time taken to attend events as they are independent sector workers and only able to attend meetings if adequate staff cover is arranged to cover workload. Reimbursement was retrospective upon invoice and based upon hourly rates outlined by the British Medical Association (https://www.bma.org.uk/pay-and-contracts/pay/other-doctors-pay-scales/salaried-gps-pay-ranges) and NHS Agenda for Change (https://www.healthcareers.nhs.uk/working-health/working-nhs/nhs-pay-and-benefits/agenda-change-pay-rates) for GPs and Care Home staff respectively. Care home managers were reimbursed at NHS Agenda for Change Band 7, nurses at Band 5 and care home staff at Band 4.
Modifications to the programme	The original plans included carrying out conference calls as another way to meet and discuss progress with improvement work. The conference calls would take place during action periods and involve each site team with the improvement team. One conference call was carried out and not repeated as face-to-face meetings were deemed more effective for reviewing and discussing project progress.
How well	Across teams and over the course of the QIC attendance was maintained (defined as attending all collaborative learning events) in 34 participants.

Table 2. Descriptions of each team's QI project

Name	Why	What (materials)	What (procedure)	Who provided	How	Where	When and how much	Modifications
Site 1: Pharmacist-led medication review for care home residents.	Polypharmacy contributes to morbidity and mortality. No consistent approach had been taken previously to medication review.	Prior to the start of this project, the pharmacist member of the group had already developed a checklist to structure and standardise medication reviews for older people.	Pharmacist reviewed prescribing on NHS electronic records then met GP and care home staff to complete medications checklist. GP changed drugs and care home staff monitored effect on resident.	Pharmacist, GP and care home staff.	Face-to-face meetings.	Care home	65 residents from 11 care homes over project time.	Care home nurse specialist joined the team at the second iteration. Dietetic materials from group 2 from third iteration. Templates developed to help care home staff monitor effect on medication changes on resident.
Site 2: Dietician-led nutrition support to care homes.	Malnutrition and undernutrition are prevalent in care homes, causes morbidity and is treatable.	Training materials to train care home staff on nutrition, diabetes and the Malnutrition Universal Screening Tool (MUST). An information pack containing homemade recipes for fortified drinks, high-calorie snacks and finger foods. A 3-day food diary and MUST protocol.	Dietician visited homes to build relationships with staff and identify specific training needs. Dietician, GP and care home staff did dietic reviews on residents with high MUST scores (based on assessments performed by care home staff) to develop dietic care plan. Dietetic assessment and care plan made available on GP electronic system.	Care home staff trainings, dietician and GP.	Face-to-face meetings at homes. Care plans made available using existing function on GP computer system.	Care home. GP practice	Training and routine MUST screening adopted by 23 homes housing 880 residents.	Interaction between dietician status, prescriptions and physical status identified over time. Links developed to discuss broader (non-dietetic) care needs with pharmacy and nurse specialist colleagues at the second iteration. Pharmacy assessment tool from group 1 included in meetings at the second iteration.
Site 3: Multidisciplinary review meetings for care home residents at risk of deterioration	Multidisciplinary review meetings already in place for residents newly admitted to care homes, but no mechanism to identify residents at risk of deterioration.	Triage tool to enable care home staff to describe concerns about residents in a structured way developed in conjunction with care home staff collaborative members.	Care home staff complete triage tool for residents they select as causing concern. Completed triage tools reviewed by dementia outreach and care home specialist nurse practitioners with access to NHS records. Members of the MDT met at care home to discuss resident. Meetings arranged on day/time of scheduled GP visit to care home. MDT members implement care plan.	Care home staff, dementia outreach and care home nurse specialist, GP, voluntary sector representative.	Face-to-face group meeting	Care home	A total of 14 residents across one residential and one nursing home.	The triage tool was redesigned following testing in the residential home. Second iteration was tested in the nursing home.
Site 4: Multidisciplinary review for newly admitted care home residents	To inform proactive multidisciplinary care to residents newly admitted to care home.	An electronic template enabling collation of multidomain assessment information, from Connected Notts [23] project.	New admissions identified by care homes staff. Healthcare multidisciplinary team assessed resident individually. Once all assessments completed, team members meet to create a care plan.	GP, community matron, care coordinator, care home manager, geriatrician and voluntary sector representative.	Face-to-face.	GP surgery	Planned to carry out once monthly. Intervention took place once during the study.	The group requested modifications to the electronic assessment template after first use. This was not completed to their satisfaction during the study period and a decision was made to abandon further MDT meetings.

Data collection and programme theory development

Data on the QICs were collected through direct observation of meetings, and interviews and focus groups with collaborative members at multiple time points. Analysis started from an initial programme theory derived from the literature, summarised in online Appendix 1 and described in detail elsewhere [14]. This outlined how QICs are thought to work generally, and barriers and enablers, which might be relevant in care homes. A final programme theory was generated iteratively through three stages of realist inquiry: theory gleaning, testing and validation. Theory gleaning interviews and focus groups were conducted after the first two shared learning events in the first 6 months of the collaborative. Participants were asked their views around what helps teams of healthcare and care home professionals work together to improve healthcare delivery. Analysis generated a second iteration of the programme theory, which used context-mechanism-outcome configurations (CMOCs) to describe what enables QICs in care homes to work, when, for whom, and in what ways. These CMOCs were then tested through further observations, interviews and focus groups in months 6–18. Interviews at this stage comprised a realist teacher-learner cycle [22], where CMOCs were presented to participants, who were asked to confirm, refute, modify or augment them. Where participants disputed the programme theory, it was revisited by recourse to study data. Theory validation interviews and focus groups were conducted 3 months after the QIC completed and comprised a sense-check of the final theory.

Data analysis

Interviews and focus groups were audio recorded, transcribed verbatim and analysed using NVivo (version 12). For each phase, two researchers (from R.D., A.G., N.C., J.B. and J.M.) independently analysed all database entries, and the wider research team met regularly to interrogate key themes and emerging CMOCs. The focus of these discussions was to establish what components of the programme theory had explanatory value and were supported by data from within and across collaborative sites.

Results

Each site team developed QI projects reflecting needs and priorities in their local areas, resulting in four distinct projects, described in Table 2.

Twenty-seven interviews and 10 focus groups were conducted. Forty-five participants informed theory gleaning (14 interviews and 3 focus groups), testing (10 interviews and 4 focus groups) and validation (3 interviews and 3 focus groups). Thirty-two participants were collaborative members and 13 worked in or had a family member living in, a care home where QI was undertaken. Of the 32 collaborative member participants, 20 participated in

repeated interviews/focus groups, contributing to either all three ($n = 10$) or two ($n = 10$) stages of theory development.

Four CMOCs, outlined in Table 3, were identified with supporting evidence to describe how QICs comprising healthcare and care home staff work together to improve healthcare in care homes.

CMOC 1: Staff will engage and sustain involvement with the Improvement Collaborative if steps are taken to minimise hierarchy and give care home staff voice, established patterns of shared working are used, and time is protected and paid for.

Care home staff spoke about the collaborative being their first opportunity to engage with NHS staff outside direct clinical care. They regarded some NHS attendees, particularly general practitioners (GPs), as being quite senior. In this context, work to overcome hierarchy was particularly useful. Successful measures included: icebreaker exercises that humanised collaborative members by asking them to talk about life outside work, agreeing shared ground rules and minimising the use of jargon and acronyms. Most members understood this to be about breaking down barriers and minimising hierarchy, and all were happy to support it.

'The closest I get to speaking one-to-one with a GP about any concerns, worries or ideas normally is the two-weekly ward round. The PEACH study . . . was all different people together who you can speak to and raise ideas or concerns'. (Care Home Manager, site 3)

'I feel like people don't necessarily take notice of what care home staff have got to say, because they're not NHS members of staff. And it shouldn't be like that. At the end of the day [they're] the ones that look after these people day in, day out'. (Specialist nurse, site 3)

We asked commissioners to recruit collaborative members experienced in working with care homes. This led to different staff mixes for each area, with sites 1, 2 and 3 recruiting a pharmacist, dietician and mental health nurses, respectively. Where working patterns were established before the collaborative, we observed rapid progress with improvement. Where there was less history of collaborative working, teams took longer to develop and progress. One area had lost many of the NHS staff working with care homes through recent de-commissioning decisions and struggled to recruit collaborative members with relevant expertise and experience.

'It's taken us longer to get going than we anticipated, our priorities are focused onto other things. That was difficult, because . . . [before] we were doing so much work around care homes'. (Commissioner, site 2)

GPs and care home staff are not directly employed by the NHS and told us that backfill payments legitimised time spent away from usual activities, particularly when asking colleagues to cover their absence. Administrative support from the improvement team for meetings was described

Table 3. CMOCs describing how healthcare and care home staff work together to improve healthcare delivered in care home

Context	Mechanism	Outcome
<p>CMOC 1: Staff will engage and sustain involvement with the Improvement Collaborative if steps are taken to minimise hierarchy and give care home staff voice, established patterns of shared working are used, and time is protected and paid for</p> <p>The remit of the QIC is broad and easy to understand.</p> <p>Staff are recruited from those with established patterns of shared working between NHS and care homes.</p> <p>Collaborative meetings are structured to minimise hierarchy and maximise participation.</p> <p>Care home and GP staff are offered backfill payments and have permission to attend meetings.</p> <p>Administrative support is provided to organise meetings.</p>	<p>A wide range of stakeholders can join the collaborative comfortable that they understand the brief and it reflects their priorities.</p> <p>Team members have learnt how to work together across NHS/care home boundaries.</p> <p>Team members are empowered to participate as equals in the collaborative.</p> <p>Team members can focus legitimately on QIC without distraction from other work commitments.</p> <p>The collaborative can focus on improvement rather than logistics and avoids placing responsibility for administration with any one professional grouping.</p>	<p>Sustained engagement with collaborative (34 NHS and care home staff remained engaged over 18 months)</p>
<p>CMOC 2: Action plans will be feasible within the local context if staff can align improvement work with existing priorities and interests, supported by a facilitative QI coaching framework</p> <p>Collaborative members have existing individual work priorities encompassing care homes.</p> <p>Quality improvement coaching is available and conducted in an appreciative style.</p> <p>Collaborative members subscribe to the principles of QI and recognise the expertise of QI coaches.</p> <p>CMOC 3: Plans will be successfully implemented if collaborative members initiate them directly, are easily able to access expertise from multidisciplinary support networks of staff external to the collaborative and use the care home as the venue for improvement</p>	<p>Collaborative members negotiate shared plans that align with their individual work priorities.</p> <p>QI coaching enables the collaborative to operationalise their ideas, without threatening staff new to QI.</p> <p>Collaborative members adjust their plans in response to QI coaching</p>	<p>Action plans reflect shared priorities, are deliverable within existing job plans, and harness existing practice networks. They are designed in ways that make them implementable (Three out of four QIC sites developed plans along these lines which they were subsequently able to implement.)</p>
<p>Collaborative members are operational staff directly involved in care delivery.</p> <p>Collaborative members have access to local support networks of health and social care professionals oriented around care homes.</p> <p>Care homes are used as the venue for improvement work.</p> <p>Contractual arrangements support contact with care homes and improvement work</p>	<p>Collaborative members start clinical interventions themselves, leading by example and maintain a tight focus on care home specific issues through care home staff involvement.</p> <p>Collaborative members recruit additional staff through their networks to support the collaborative. MDTs coalesce around the collaborative.</p> <p>Hosting all meetings related to the intervention in care homes maintains focus on care home work and gives some control to care home staff.</p> <p>Staff can 'count' work against existing contractual obligations</p>	<p>Measurable process and outcome metrics demonstrating changes to patient care. (Site 1 carried out 63 medication reviews in 11 care homes, site 2 conducted 355 reviews of dietetic prescriptions across 20 homes. Site 3 conducted 13 MDT reviews across 2 care homes.)</p>
<p>CMOC 4: Improvement plans will become more comprehensive over time, where sites adopt an iterative approach, learn from each other and broaden initial improvement plans to incorporate new ideas from the QIC</p> <p>Improvement teams are transparent about successes and failures at large collaborative meetings.</p> <p>An overarching framework emphasises the importance of holistic approaches to care.</p> <p>QI coaching facilitates cross-site learning and iteration of improvement.</p>	<p>Site teams value cross-site learning and adopt the most successful parts of each other's interventions.</p> <p>legitimises QIC members enlisting broader support through their networks to replicate the successes of other sites.</p> <p>QI coaches play a role in signposting, ensuring teams have necessary specialist support to broaden out their interventions.</p>	<p>Interventions grow over time, becoming multicomponent and multidisciplinary. A growing improvement community coalesces around improvement plans.</p>

to take menial tasks away from busy clinical staff and to ensure that control of the collaborative did not rest with one professional grouping.

CGA was chosen as the remit for the collaborative because of its emphasis on comprehensive and holistic care. The ambition was that this would attract and recruit a wide range of practitioners. In practice, it drew people to the collaborative because CGA had achieved prominence in local and national policy documents at the time, not because collaborative members understood or felt motivated by it. Indeed, CGA was felt by many to be difficult to reconcile with existing practice frameworks including holistic primary care and person-centred care.

'it would have been helpful to have more clarity about what sort of things fit into the concept of CGA. Because people have spoken about CGA for years, when you ask somebody what does it look like everybody's got a different idea'. (Commissioner, site 2)

In light of this, the improvement team decided early on to deemphasise CGA and focus, instead, on delivering holistic care to older people. This was sufficiently straightforward to enable teams to progress.

CMOC 2: Action plans will be feasible within the local context if staff can align improvement work with existing priorities and interests, supporting by a facilitative QI coaching framework.

Staff who already had a focus on care homes, or activities highly relevant in care homes such as deprescribing or nutritional review, were more readily able to align improvement ideas with existing work roles and interests.

'part of the project . . . was to identify what are the job roles already present in the system and what are their current priorities. What I felt in the meetings was that the people who were better aligned with this project were more engaged'. (Geriatrician, site 2)

Those without a care home focus in routine work struggled to make the QIC a priority amidst competing commitments.

'we haven't had a vanguard, so we haven't had extra funding to get people in post. We don't have a care home pharmacist. We have done this on a shoestring, I literally mean people giving up their time when actually for me this morning it's meant that there will meetings that I will have to do in my spare time, the little spare time I have'. (Commissioner, site 4)

Equal input from care home and NHS staff was needed to create a feasible action plan which worked for all. Care home staff provided crucial input around the needs of care home residents and organisations, and the team collectively identified and planned how to address these. Where one sector, staff group, or individual took responsibility for the bulk of planning, this led to failure to progress. This was most marked in site 4, where medical staff took responsibility for perfecting an electronic pro forma for multidisciplinary meetings. Dependency on medical staff was challenging as doctors were often otherwise committed.

'as a group, we've been kind of dependent on the GP . . . and we didn't want to make any decisions about GP involvement unless he was happy and then, because he wasn't there for some meetings, we couldn't take it forward'. (Geriatrician, site 4).

QI coaching was observed to encourage teams to break tasks down into manageable chunks, consider process and outcome measures that could demonstrate improvement and support team members writing improvement plans. Where staff did not subscribe to the principles of QI, progress was slow. One team who expressed frustration as they tried to implement a complex intervention were observed on multiple occasions to rebuff suggestions from the QI coach to start with smaller more straightforward plans.

'there was frustration . . . that we weren't moving things forward as quickly as we should. But I think we also felt that we wanted to improve, and what we had wasn't a working tool, and it needed to be better before we could roll it out. I think it wasn't us being obstructive, it was us wanting to make sure that this is something that everybody could use'. (Commissioner, site 4)

CMOC 3: Plans will be successfully implemented if collaborative members initiate them directly, recruit multidisciplinary support networks of staff external to the collaborative, and use the care home as the venue for improvement.

The groups that progressed most towards improvement goals were led collaboratively by care home and NHS staff involved in direct clinical care. They created guidelines or pro formas for the project and problem solved together. The pharmacist in site 1 created and iterated a template and checklist for medication review together with care home staff. The care home and NHS staff in site 3 together developed an assessment form to identify residents at risk of deterioration. Most teams relied on paper resources to co-ordinate care because these could be quickly developed and iterated. Site 4 sought an IT solution, which blocked progress because of the complexity of data governance across multiple organisations.

'the big bit was around the IT solution . . . and making sure it was right before we tried to roll it out . . . we tried to, obviously, with the secure NHS data connection in care homes, the IT team were looking at that. But I'm not sure either progressed' (Community matron, site 4)

QIC members with local support networks were able to use existing relationships to recruit multidisciplinary expertise to support improvement plans. The site 1 pharmacist recruited a nurse practitioner to support medication reviews and the site 2 dietician enlisted help from care home pharmacists for shared reviews.

Conducting meetings in care homes allowed care home staff control over how meetings fitted with care home routines and allowed GPs to engage with the group away from

competing tasks at their surgeries. The change in territory and control enabled care home staff involvement in conversations. In areas where GPs had an existing contractual obligation to visit the care home weekly, this provided an opportunity to do the work.

'GPs only do rounds on certain days, you don't want to put them out by getting to come on a different day'. (Nurse specialist, site 3)

The complexity of recruiting GPs to support improvement plans was a recurrent issue. Even GPs within the QIC, who were either care home enthusiasts or had leadership roles, struggled with how to engage GP colleagues who were seen as time poor and unable to devote much attention to care home improvement.

'I'm not your average GP . . . What I'd like to know is how we can spread this out to other GPs who by and large aren't that interested in care homes'. (GP, site 1)

Whilst contractual arrangements could help facilitate improvement work, they could act as a block if requirements or incentives for care home work were unclear. Towards the end of the study, contractual uncertainty made some participants less able to continue the QIC.

'I mean I think the new community services contract, until the details of that are completely clear I can't contribute anything else to PEACH'. (Nurse Specialist, site 3)

CMOC 4: Improvement plans will become more comprehensive over time, where sites adopt an iterative approach, learn from each other, and broaden initial improvement plans to incorporate new ideas from the QIC.

A pattern emerged whereby sites 1 and 2, which started off with easy to implement specialised improvement plans, made these broader and more multidisciplinary over time. By contrast, site 4 attempted to implement CGA *en bloc* having not previously done such work and was unable to progress due to the complexity of co-ordinating inputs from multiple professionals and organisations.

For sites 1 and 2, the QIC played a key role during the 'broadening out' phase, presenting options about what to do next. As a consequence, the pharmacist and dietician in sites 1 and 2 shared and implemented each others' assessment materials. Both sites looked to the established patterns of working in site 3 as an example of functioning multidisciplinary care.

Staff from site 4, where less progress was made, continued to attend the collaborative although there was no direct contractual or managerial requirement to do so. They spoke about the value of learning from sites where projects were working, providing impetus to review and improve individual practice on return to work.

'I came back [from the collaborative meetings] and focused better here. I'd come away and the next day I'd come to work and think, right, I wonder how we are functioning with regard to what we spoke about at the PEACH meeting, let me look into it, and it was either, "we're fine," or, "oh I need to speak to staff and residents"'. (Care home manager, site 4)

Measurement for change

Measuring change in process and outcome measures is a core component of QICs. The QI coach was observed to repeatedly emphasise this to site teams. Despite this, no site developed individualised measurement plans. This did not delay progress towards implementation but did impair teams' ability to demonstrate the impact of their work.

Several barriers to collecting measurement for change data were described. First, some collaborative members did not feel it would improve understanding of improvements.

'Why do we need to measure the impact? We know it's going to work'. (GP, site 4)

Second, collaborative members were pre-occupied with QI work and felt they did not have time to collect data:

'I mean he [the QI coach] asked us some really challenging questions [about data] . . . actually we thought, we haven't got time for this. And I think it was at that point we probably disengaged a bit'. (Commissioner, site 2)

Third, in some areas, data plans were complicated by having to draw data from multiple sources of information:

'Some are on EMIS Web, some are on SystemOne and, obviously, there's the hospital information system and it's just, there are ways of drawing from all the data, but that's work in process'. (GP, site 1)

Finally, across all sites there was a tension between data collection for commissioning purposes, which was widely accepted as a good use of data, and measurement for change at a clinical level, viewed as less important.

'Well, actually, I don't want you to collect any data, because the data I need has to show the return on investment, which is very different to the data that the Improvement team would need'. (Commissioner, site 2)

Discussion

The focus of this paper was to describe the patterns of working that deliver change and improvements when using a QIC approach focussed on healthcare in care homes. We found that QICs will be able to implement and iterate improvement plans where they have a broad remit which is easy to understand; recruit staff with an established pattern of working between the NHS and care homes; use specific strategies to minimise hierarchy; protect and pay for staff time; direct staff to implement improvements that align with existing work; support members to develop plans in manageable chunks through QI coaching; encourage QIC members

to draw on existing work networks for multidisciplinary support; hold meetings in care homes to work around the schedules of care home staff and GPs; and use shared learning events to enable staff to build multidisciplinary interventions in a stepwise fashion.

A number of these findings, for example the importance of coaching and the role of shared learning events in consolidating and iterating improvement plans, match previous findings from the improvement literature [24,25]. Other findings, for example showing that better outcomes were realised when care home and NHS staff had established common ground, mirror earlier work from the care home literature [2,6,26]. Previous studies, though, have not unpacked in a detailed way how QICs work in care homes. Understanding what components work when, for whom, and under what circumstances is an important step forward.

A commonly stated mantra in Quality Improvement is that, 'whilst all improvement is change, not all change is improvement'. [27] The corollary of this is that to understand what change is improvement, practitioners need to measure processes and outcomes with sufficient robustness and frequency for statistical tests of change to be applied. Teaching our site teams about this, and reinforcing the importance of measurement for change, did nothing to enable or empower them to implement measurement plans. The time and resource requirements to 'measure what matters' are well described, even where statutory datasets and metrics are in place [28]. In UK care homes, however, there are no statutorily mandated datasets or metrics. Data are collected in inconsistent ways, and incompletely collated, whilst information governance is negotiated between multiple organisations, with lines of responsibility often unclear [29]. Given the findings here about the reticence of NHS and care home staff to collect additional data, it is important that proposals to develop minimum datasets in UK care homes, already underway, take account of the likely needs of teams who will need to undertake measurement for change as part of improvement in the sector.

GPs were crucial enablers for implementation. This is consistent with the important co-ordinating role GPs have in the delivery of healthcare in care homes [26]. We found, however, that when improvement initiatives were contingent on GPs playing a central or leading role, then they were at risk of stalling. This was because of competing demands on time, an increased focus on medical aspects of care, and reinforcement of traditional hierarchies with consequent disempowerment of other staff groups. Similar findings about both the importance and role of GPs have come from care home improvement work undertaken in the Netherlands [4], so these findings are not unique to England although they may be even more important here because of the central role of GPs within the NHS. An ongoing realist synthesis will explore these issues and consider what needs to be in place for GPs to play a productive role in improvement in care homes [30].

Much of the literature on leadership in care homes has focussed on the role of care home managers as leaders in

social care delivery [31]. Our findings suggest managers can also play an integral role in leading healthcare improvements for their residents. Throughout the study, we saw care home managers and staff engage in the QIC with enthusiasm. They generated improvement ideas, hosted QIC meetings, advocated for the initiative and went on to ensure the delivery of improvement interventions within their care homes. Where they were not able to do so, it was because one or more NHS staff dominated the improvement team and the care home staff were unable to challenge this or offer alternative approaches. An important lesson is for QI coaches not to allow teams to partition along organisational lines, as this may reinforce care home staff feeling like outsiders. Some of the care home managers involved in the QICs were registered nurses by training and supervised nursing teams as part of care homes with nursing, but this was not universally the case. The debate around the importance of nursing expertise in care homes is one commonly visited in the international literature [32], but we saw excellent leadership in our study even when nurses were absent. It could be that the focus on specific professional groupings misses the true question of what skills are needed to lead in long-term care.

Using CGA to focus discussions was a justifiable starting point. CGA, however, is a complex intervention and the term has been recognised, even by its proponents, to be a misnomer [33] because it is essentially about delivering appropriate holistic care, albeit it crucially underpinned by comprehensive assessment. In the context of this study, CGA proved difficult to understand and operationalise for the staff involved because it was superimposed on pre-existing ways of working that already encompassed aspects of CGA. The principle of multidomain assessment by multidisciplinary teams (MDT) was widely accepted but participants regarded this as a self-evident component of good care, rather than as a part of CGA. It may be that CGA is a useful framework for improvement teams supporting QICs to keep in mind but that it is too much to expect participants to learn about both CGA and improvement methodology at the same time.

The strength of our iterative approach to programme theory development was that it allowed participants from diverse backgrounds to debate, question and shape the understanding of what happened during the collaborative. That our findings represent an effective synthesis of observations from the disparate care home and improvement literatures suggests that this approach was successful. A limitation is that the study team had a dual role, to act as intervention facilitators and evaluators. This could have biased our understanding of the contexts and mechanisms at play. A separate part of the PEACH study analysed the impact of the QIC on quality of life and NHS resource use [34]. A paper summarising these findings is in preparation. The purpose of this paper is to present findings about the process of using QICs in the care home setting.

Our findings are based on work undertaken in one part of the UK and this could challenge the broader relevance of the programme theory; however, the alignment of our findings

with studies undertaken in other regions and countries [3,4] suggests that much of what we have found here applies outside of the local context. In many countries, commissioners would not be sufficiently integrated into health systems to enable them to play the co-ordinating role that they played here and they could, in some jurisdictions, be precluded by law from engaging in service delivery. In other countries GPs do not play a central role in healthcare for care homes. International readers may find it easier to consider commissioners as 'regional leaders in health and social care' and GPs as 'accountable healthcare professionals' when translating our descriptions to their national setting.

Implementation of these findings will depend, in part, on opportunities for staff to interact in a structured way with sufficient QI support and guidance. In England, the recent roll-out of Enhanced Care in Care Homes, part of the NHS long-term plan [35], with consequent reconfiguration of how healthcare is delivered to care homes, represents one such opportunity. Yet the focus of this initiative has so far been on strategy, without any attention to supporting teams to operationalise improvements in a consistent way. The findings presented here could, if consistently deployed, be of significant help. Internationally, attention has recently turned to how the similarities in long-term care settings merit common responses [36], despite the differences in how long-term care is organised. They have not, hitherto, considered the role of QI, or QICs, in developing such common responses. The programme theory here presents some unifying principles that could provide a basis for such work.

In conclusion, a QIC focussing on improving the care of older people in long-term care homes can enable context-sensitive improvement plans. The four CMOCs comprising our programme theory describe contextual aspects which are open to influence. By addressing the themes identified, multiprofessional teams aiming to bring about improvements in the sector can be more confident of success.

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