How, why and under what circumstances does a quality improvement collaborative build knowledge and skills in clinicians working with people with dementia? A realist informed process evaluation

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ABSTRACT

In increasingly constrained health and aged care services, strategies are needed to improve quality and translate evidence into practice. In dementia care, recent failures in quality and safety have led the WHO to prioritise the translation of known evidence into practice. While quality improvement collaboratives have been widely used in healthcare, there are few examples in dementia care. We describe a recent quality improvement collaborative to improve dementia care across Australia and assess the implementation outcomes of acceptability and feasibility of this strategy to translate known evidence into practice. A realist-informed process evaluation was used to analyse how, why and under what circumstances a quality improvement collaborative built knowledge and skills in clinicians working in dementia care.

This realist-informed process evaluation developed, tested and refined the programme theory of a quality improvement collaborative. Data were collected pre-intervention and post-intervention using surveys and interviews with participants (n=28). A combined inductive and deductive data analysis process integrated three frameworks to examine the context and mechanisms of knowledge and skill building in participant clinicians.

A refined program theory showed how and why clinicians built knowledge and skills in quality improvement in dementia care. Six mechanisms were identified: motivation, accountability, identity, collective learning, credibility and reflective practice. These mechanisms, in combination, operated to overcome constraints, role boundaries and pessimism about improved practice in dementia care.

A quality improvement collaborative designed for clinicians in different contexts and roles was acceptable and feasible in building knowledge, skills and confidence of clinicians to improve dementia care. Supportive reflective practice and a credible, flexible and collaborative process optimised quality improvement knowledge and skills in clinicians working with people with dementia.

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BACKGROUND

The challenge of implementing evidence-based guidelines into clinical practice continues to be of concern in healthcare.[1] In dementia care, recent Organisation for Economic Co-Operation and Development (OECD) reports show poor care and low training persists in member countries.[2] In Australia, serious failures in dementia care[3] have prompted inquiries into safety and quality.[4] Despite evidence of post-diagnostic interventions improving quality of life, scepticism exists about the ability of people with dementia to benefit, resulting in lower uptake of evidence.[5–7] In this context, the WHO Global action plan on the public health response to dementia 2017–2025[8] identified as a priority, the need to translate known evidence into practice. In the complex field of dementia care, understanding what strategies work[9] to overcome barriers to implementation is key to improve the quality of care for people living with dementia.

One approach widely used to implement evidence-based practices is the quality improvement collaborative (QIC).[10] This approach developed by the Institute for Healthcare Improvement[11] involves bringing together health professionals to learn and share methods to improve care. Key elements include a focus on a specific topic of healthcare, participants from multiple sites, clinical and quality improvement experts to provide advice and guidance to participants, structured activities to identify and try out improvements over time and monitoring of progress against the aims of the improvement.[12 13] Despite their appeal in improving healthcare,

high set up costs and varied success limit confidence in their use.[10 14 15] There are few examples of QIC applications in dementia care.[16–18]

Recent studies of QICs have described components,[12 19] reported on evaluations,[20 21] effectiveness[10] and cost-effectiveness,[15] and identified factors influencing outcomes.[22–24] Researchers identified the need to open the 'black box' of QICs to understand how components contribute to success.[13 25 26] A theory-based understanding of the QIC process is advocated to better understand the influence of context on outcomes.[27 28] Understanding how and why QICs work under different circumstances is critical to assess suitability and justify the approach. Complex interventions such as QICs are multicomponent processes that interact with each other and the external and organisational contexts in which they operate.[29] Linking a theoretical approach to an evaluation framework helps better understand how to design implementation interventions and evaluate how they work. Realist approaches have been used to understand how QICs work[28] and several studies have reported realist evaluations of process and outcomes.[30–32] Few studies have used a realist approach[33] or explored the use of QICs to improve quality of dementia care.[34] Realist evaluation[35] provides methods to understand how clinicians build knowledge and skills to improve dementia care in diverse settings.[36]

METHODS
Aim
This realist-informed process evaluation aimed to improve our understanding of how a trial QIC worked to implement evidence-based guidelines into practice in dementia care. The approach uses realist evaluation methods to focus on how feasible and acceptable the QIC was at the trial stage.[30 37 38] A full realist evaluation would have considered the effect on guideline adherence.[37 39] This component of the evaluation has been reported separately by Laver *et al*.[40] Research questions are:

1. How, why and under what circumstances do QICs build knowledge and skills in clinicians to improve quality and practice?
2. Was the QIC approach acceptable and feasible to clinicians?

The process evaluation was embedded within a translational research trial (referred to as 'Agents of Change') which examined whether QICs could improve adherence to several recommendations in the Australian Clinical Practice Guidelines and Principles of Care for People with Dementia (referred to as the guidelines hereafter).[41] Full methods for the trial have been published in a protocol paper.[41] The effect of the QIC on the outcome of guideline adherence was measured using an interrupted time series design and results were reported recently.[40] Clinicians responded to advertisements for the collaborative and self-selected to join one of three subgroups within the collaborative related to implementation of exercise,

carer support or occupational therapy recommendations. A light touch, low cost intervention was trialled. This included online learning modules, teleconference meetings and email communication to reduce time and costs of participation. Local adaptation of the guideline recommendations was encouraged. Online supplemental file 1 summarises the components involved in this QIC.

Patient and public involvement
Experts-by-experience of dementia (people with dementia and caregivers) were involved in developing priorities and advising researchers and clinicians throughout the trial of the QIC. One expert-by-experience of dementia was an investigator in the trial and was involved in the conduct and monitoring the evaluation. She provided advice and comments on the text and with other experts-by-experience of dementia advised on the form of acknowledgement of their work. Results of the main trial and from this and other studies have been sent in email newsletters to all participants and co-researchers with a link to the published papers. Experts-by-experience of dementia and coresearchers have presented results at national and international conferences. An evaluation of their impact will be reported separately.

Study design
This process evaluation followed guidance on process evaluation[37 42] and realist evaluation[35] in knowledge translation interventions.[43] It addressed implementation outcomes of acceptability and feasibility of the trial of the QIC approach in building skills and knowledge of participating clinicians.[30 39] Outcomes of fidelity, penetration and uptake of the clinical guidelines for dementia care as described in the protocol paper[41] were reported recently.[40]

The study was completed in four phases:

Phase 1: development of the initial programme logic and programme theory to be confirmed with the research team.
This involved: (1) describing the strategy and logic of the programme, (2) hypothesising a programme theory (3) proposing underlying mechanisms (M) to achieve the implementation outcomes (O).[37] This is denoted as context (C), mechanism (M) and outcome (O) configurations[35] to enable understanding of the relationship between these programme aspects.

The initial programme theory was developed through iterative searches of grey literature and academic databases for theory components as recommended by Booth *et al*.[44] Terms used were collaborative learning, quality improvement, skills and knowledge, guideline implementation and QIC in healthcare.[29 44] The multiple components of the QIC method[45] were explored by reference to Institute for Healthcare Improvement[11] and The Health Foundation reports,[46 47] then initial theory components were identified.[48] A limited stakeholder (trial research team) consultation developed 'If…then' statements (figure 1A), to be tested with clinicians at post-intervention stage.

Part A: Initial program theory developed through literature searches and stakeholder consultation

presented as 'If...then' statements

"If motivated clinicians from diverse settings join a quality improvement collaborative with the support of their managers, they then engage with the process and commit to completing the program. If they learn online with other like-minded clinicians, then they can collaborate in a virtual space to share and adapt evidence-based guideline recommendations to their setting. If credible experts provide advice, feedback, and coaching to improve plans then clinicians have confidence and skills to make small stepwise changes, involve co-workers, and implement changes to their practice. If the benefits are seen and there is little disruption, then the quality improvement process is accepted in their workplace, and clinicians are recognised for their work to improve dementia care."

Part B: Refined program theory after testing with participant clinicians in the process evaluation

presented as 'if...then' statements

"If motivated clinicians from diverse settings join a quality improvement collaborative with the support of their managers, organisations, and networks, they then engage with the process, believe that improvement is possible and commit to the program. If the topic of the collaborative fits their professional role and identity and is linked to credible sources, then clinicians have confidence to put effort into completing the program. If clinicians see that the program is flexible, structured, and practical with time to learn and implement change then they accept that it is feasible for them to participate. If they learn online with other like-minded clinicians, then they can connect in a flexible virtual space that fits their work demands and roles, to share and adapt evidence-based guideline recommendations to their setting. If credible experts provide advice, feedback, and coaching to improve plans then clinicians are encouraged to make small stepwise changes, involve co-workers, and implement changes to their practice. If the benefits are seen and there are links to organisational drivers, then the quality improvement process is accepted in their workplace, and clinicians are recognised for their work to improve dementia care. If clinicians reflect on the process of improving quality and the contextual constraints, then they gain a sense of empowerment in their practice."

Figure 1 Initial and refined programme theory of a Quality Improvement Collaborative in agents of change trial.

Phase 2: pre-intervention and post-intervention data collection of surveys and interviews (quant +QUAL)

A concurrent mixed-methods approach[49] was used to develop an understanding of the clinicians' experience in the QIC. The survey tool Quality Improvement Knowledge Assessment tool (QIKAT-R)[50] identified changes in their level of knowledge of quality improvement over two time points. The Normalization MeAsure Development (NoMAD) survey[51] was used to identify clinicians' understanding of processes to normalise changes in practice on commencement and at completion of the programme. Pre-intervention interview questions were developed to explore context using the Consolidated Framework for Implementation Research (CFIR),[52] the processes of implementation using normalisation process theory (NPT)[53] and expectations of the QIC using programme theory.[35] At post-intervention stage, questions related to clinicians' experience, barriers and enablers, and achievements. The initial programme theory was then shared with clinicians to explore their reasoning and response to the hypotheses.

Phase 3: data analysis, patterns of mechanisms and hypothesis testing

A framework analysis of interview data identified change in knowledge and skills, multilevel contextual influences and clinicians' experience of the collaborative. Exit interviews were conducted with clinicians who withdrew from

the collaborative to provide an understanding of their reasons for withdrawal. Summaries of patterns of mechanisms are presented for three major settings in which clinicians worked. The interviews described acceptability and feasibility of the trial of the QIC and how learning generated change.[54] The survey data were integrated with the patterns of mechanisms to test the programme theory.

Phase 4: refinement of the initial programme theory

First, the initial programme theory was shared with clinicians in the post-intervention interviews. The 'if…then' propositions were discussed to assess if and how each applied. Clinicians offered their own rationale for each proposition, some refuting, some confirming and most refining the propositions. Second, these responses were compared with the pre-intervention results to identify where they differed and to revise the theory of how and why the QIC worked and in what circumstances.[48] Third, survey results were integrated with interview results to identify patterns of mechanisms and differences between three main setting types. Where patterns matched hypotheses the programme theory was confirmed. Where data did not match, the hypothesis was refuted and where additional conditions were identified, the programme theory was revised to improve understanding of how the trial QIC built knowledge and skills for clinicians.[43]

Data collection

Surveys

Quantitative data were collected in two surveys, using the QIKAT-R[50] and the NPT measure (NoMAD)[51] administered pre-participation and post-participation in the collaborative. QIKAT-R is designed to assess clinicians' ability to write an aim, a measure and change for a quality improvement scenario.[50] NoMAD[51] assessed the degree of agreement of clinicians with statements based on the four NPT[53] constructs of normalising a change to practice.

Clinicians consented to participate in the evaluation and undertook the surveys online in the introductory and final learning modules. Data were extracted for analysis of changes in understanding. Online supplemental file 2 provides an outline of the interview questions and online supplemental files 3 and 4 provide an example of the NoMAD and QIKAT-R surveys used in the online learning modules. On completion of the programme clinicians were asked to comment online on their degree of success in implementing change.

Interviews

Clinicians were invited to participate in interviews and were introduced to the evaluator via an email from the project coordinator (MCa). The first author (LdlP) undertook the evaluation as a PhD student with experience as a clinician in aged care and sought consent via the approved ethics process. Semi-structured private telephone interviews, up to an hour, were conducted by LdlP with clinicians, on commencement and completion of the programme. The same interview guide was used

for each person to describe their motivations, experiences, setting and role. A realist interviewing approach using a supplemented interview guide was added at the post-intervention stage to share the initial programme theory and understand their reasoning and responses.[55] With consent, interviews were recorded and transcribed, checked for accuracy and sent to clinicians for comment or addition. Field notes made by LdlP during the interviews added information for accuracy, emphasis or requests to stop recording of parts of the interview.

Data analysis

Surveys

Responses were extracted from the online surveys, de-identified for each clinician and compared with identify change in knowledge and skills of quality improvement (QIKAT-R) and engagement in processes of normalising implementation (NoMAD). Results were scored (by LdlP and GR) for QIKAT-R[50] using the rubric provided. The principal researcher (KL) resolved any discrepancies. The NoMAD[51] survey responses were converted to a five-point Likert scale[56] (by LdlP and checked by GR). Descriptive statistics were used to present the degree of agreement with implementation processes by clinicians. Small sample sizes, missing data and lack of controls limited further statistical analysis.

Interviews

Interview data were transcribed verbatim, de-identified and entered into NVivo V.12 software,[57] for analysis using a combined inductive and deductive[58] framework analysis approach.[59] Three frameworks were used to identify: issues related to the context (CFIR),[52] the social processes involved in normalising the change (NPT)[53] and the mechanisms at work within the collaboratives and the broader context (RE).[35] These frameworks provided additional insight into context (C), mechanism (M), and trial outcomes (O) to understand how, why and in what circumstances the collaborative may work. A recent model for synthesising multilevel data in implementation research has similar approaches.[60] Table 1 shows the alignment of these frameworks.

Coding categories were developed from the frameworks and interviews were coded deductively (LdlP) with 30% checked for consistency (GR). Any differences were resolved by discussion or consultation with the principal researcher (KL). Elements of context, mechanism and outcomes patterns were searched for in the data through a deliberate and inductive process.[30] Quotes from interviews were extracted and presented in the results. This adapted framework analysis was used to confirm, refute or revise the initial programme theory.[61]

Integration of results

Data from interviews and surveys were integrated at both the pre-intervention and post-intervention stages through description and joint display[62] to identify where they confirmed, refuted or revised the initial programme

Table 1 Alignment of frameworks for analysis of qualitative data

Context: Setting, team and individual elements: CFIR[52]	Initial mechanisms of change in QIC explored: RE[35 66–68]	Social processes in normalising the change: NPT[53]	Questions for interviews with participant clinicians
Context (external and QIC resources))	Identity, motivation to improve quality of dementia care	Coherence: changes make sense	Changes in policy funding processes, fit with organisation and practice, needs of clients, barriers to services or change
Organisation (team, support)	Accountability and reward drivers internally and in organisation	Cognitive participation: engaging others in planning for changes Collective action: engaging others in change actions	Support provided from manager and team, resources available, accountability for outcomes, recognition
Professionals	Collaboration, doing it together, motivation, commitment	Collective action: engaging others in change actions	Learning about evidence-based practice, quality improvements, networking, achievements, CPD and other incentives
Intervention (Guideline recommendations for exercise, carer support and occupational therapy and the Plan-Do-Study-Act process[69])	Easy to do, credible, achievement and recognition	Collective action- engaging others in change actions Reflexive monitoring- reviewing effects, evaluating changes	Fit with service and values, flexibility, acceptability, practicality, outcomes

CFIR, Consolidated Framework for Implementation Research; CPD, continuing professional development; NPT, normalisation process theory; RE, realist evaluation.

theory. A revised programme theory was developed to explain how and why the collaborative built knowledge and skills in quality improvement.

RESULTS
Participants
Of the 45 clinicians in the Agents of Change trial, 28 (62%) were involved in the process evaluation.

The QIKAT-R was completed by 26 (58%) clinicians at pre-intervention and 18 (38%) at post-intervention. The NoMAD survey was completed by 13 (29%) clinicians at pre-intervention and 15 (33%) post-intervention. Table 2 presents the characteristics of clinicians, showing the range of professions, settings, locations, type of organisation as well as the subgroup chosen for the collaborative.

Pre-intervention and post-intervention survey results
Results for pre-interventionand post-intervention surveys are presented in online supplemental file 5 (NoMAD) and online supplemental file 6 (QIKAT-R). Most clinicians (80%) scored poorly on the QIKAT-R prior to the intervention, demonstrating limited knowledge about quality improvement. This finding validated the need for learning. These scores improved modestly post-implementation. In the pre-intervention NoMAD survey, most clinicians (70%) saw the need for change, and how the guidelines differed from their current practice. They were optimistic about the support they would have from managers and the collaborative but were less confident in their coworker abilities to implement the

changes. Post-implementation, most indicated decreased support from their managers and increased confidence in coworkers.

Pre-intervention interview results
Interviews were conducted with 24 (53%) clinicians. They reported feeling highly motivated to undertake the process and participate in the collaborative subgroups. Over 85% reported having no experience of leading quality improvement processes and were unsure of their knowledge or how the implementation process would unfold in their setting

Context
Most clinicians identified external policy and funding constraints on their organisations which would impact on their practice. This was reflected in changes to their roles, restructuring of the organisation and time constraints.

> We're going through a major…change with the new CEO…challenge for me is that because staff are unhappy, we are having a high turnover (participant S11).

In public hospital services, multidisciplinary teams and formalised quality improvement structures were identified as being supportive of the proposed changes. In aged care settings, however, most participants identified role boundaries and scepticism as barriers to quality improvement.

Table 2 Characteristics of participant clinicians by collaborative subgroup in the process evaluation

Characteristics	Collaborative subgroup (n%)		
	Exercise n=12	Carer support n=6	Occupational therapy n=10
Female	10 (83%)	6 (100%)	10 (100%)
Male	2 (17%)		
Regional/rural/remote	3 (25%)	2 (33%)	2 (20%)
Profession			
Physiotherapy	10 (83.4%)	1 (16.7%)	0 (0%)
Occupational Therapy	0 (0%)	1 (16.7%)	10 (100%)
Nursing	1 (8.3%)	2 (33.3%)	0 (0%)
Medicine	1 (8.3%)	0 (0%)	0 (0%)
Dietetics	0 (0%)	1 (16.7%)	0 (0%)
Health services	0 (0%)	1 (16.7%)	0 (0%)
Organisation type			
Public	3 (25%)	3 (50%)	4 (40%)
Private	2 (16.7%)	0 (0%)	0 (0%)
Not for profit	7 (58.3%)	2 (33.3%)	4 (40%)
Sole provider	0 (0%)	1 (16.7%)	2 (20%)
Service setting			
Acute	1 (8.3%)	1 (16.7%)	3 (30%)
Sub-acute/transition care	2 (16.7%)	0 (0%)	1 (10%)
Community/outpatient	2 (16.7%)	5 (83.3%)	6 (60%)
Residential	5 (41.6%)	0 (0%)	0 (0%)
Residential and community	2 (16.7%)	0 (0%)	0 (0%)

No doubt there'll be a bit of resistance from … staff, … 'why should I do it your way, I've done it this way my… entire life?' (participant E11).

What we do is treat pain or put things into place to prevent falls, but that's all you can do (participant E10).

Wait and see approach
Most clinicians were unaware of the existence of the guidelines before commencement and were uncertain of how recommendations could be adapted to their practice. While most understood how the trial QIC would work, they were cautious about what would be required in their setting.

Implementation processes
Clinicians in all settings understood the intent to adapt implementation of the guidelines to suit their setting and expressed confidence that this approach was acceptable and feasible.

I feel fairly confident that we will be able to get things off the ground and make some changes (participant S15).

Those working in hospital settings were more likely to have experience of quality improvement and had begun

to identify who they needed to involve in the change process.

…needs to go through my director and the … reference group …so any reporting back on any changes in process or procedure …would have to be verified … and approved (participant C06).

Most clinicians understood that implementing changes would involve communicating with others and engaging them in new practices.

Mechanisms
The mechanisms identified from interviews were similar but described differently by clinicians in each of the three main settings. Table 3 presents initial mechanisms identified across three settings for participants.

Post-intervention interview results
On completion of the QIC, interviews were conducted with 16 (36%) clinicians. Most reported their acceptance of and satisfaction with the process. They identified significant skills and understanding gained from the process.

A solid methodology and a solid quality improvement plan have been really critical in getting us to a point where it's working and sustainable (participant S13).

Table 3 Initial mechanisms identified across three key settings, with example quotations

	Public hospital services n=14	Residential and community aged care n=6	Private practitioners n=4
Motivation and building confidence to engage in change	Improved job satisfaction and interest in dementia care were motivators 'I hope to improve the service that I'm delivering and gain knowledge and confidence' E10	Encouragement to improve services after stress of changes and interest in dementia care 'if it improves the quality of life of our residents it's worth doing' E11	Broadening business goals and interest in dementia care 'it just provides us with another option that we can then promote to future clients for the business' E04
Accountability to strengthen commitment to change	Formal staged schedule to fit in with time constraints 'I think the structure of that agents for change… with how we develop a project as such, will help me'C06	Structure to guide process and provide flexibility '…guided through and supported through the whole thing and not left to your own devices' O05	Regular reminders to keep the collaboratives as a priority 'if you're doing it on your own, it'll sort of get pushed to the back again' E08
Sense of identity reinforced	Professional leadership in services 'I think it is a really transferrable skill in demonstrating leadership and giving people opportunities to step up' S13	Commitment to improved quality of services for people with dementia 'I'm very passionate about people with dementia so with my values I want to make sure that they're maintaining their independence and participating in things they want to participate in.' O04	Specialist provider to people with dementia 'I'm aiming for our OT practice to be specialist in services for older people' O03
Collective learning increases mutual support	Sharing knowledge for improvement was valued '…breadth of the experience… from the team itself will be really valuable to share' C06	Learning from others and comparing interventions helped assess services '…you can pool your ideas and see where the problems are, who's having success in certain areas' E05	Sharing knowledge enhanced satisfaction in the work 'Feeling confident that I'm following best practice which, for me, creates better job satisfaction' C05
Doing it together increased safety to learn and make mistakes	Overcoming isolation and providing confidence to learn 'I really just want that contact because… I was quite out of my depth, going I don't know if I'm going in the right direction' E09	Re-energising by working with like-minded others 'Great to have so many likeminded people in the one place.' C08	Practical guided approach motivated participation 'I see it as being more practical, which appeals to me' O07
Credibility increases trust and acceptance of the process	Valued evidence base and shared focus on improvement in process 'I mean, the evidence is really there and it's exciting to work with people who are on that same train of thought. That's the joy of it' O09	Evidence base fits with accreditation standards '…recognition that it's obviously a project that would be of interest to the organisation'C08	Connection between best practice and research '…people Australia-wide who have been involved in it and are basing their practice on research and the evidence'C05

OT, occupational therapy.

They reported how the process enabled them to review their own practice.

> …quite a bit of reading and reflection that was involved in the project, especially when you're going through that PDSA cycle (participant C05).

However, they reported that overcoming preconceived ideas was demanding.

there was a bit of education with the staff … at that particular site had some preconceived notions about whether people could attend or not (participant E13).

> …people go, 'Oh no, I haven't really had anyone that's suitable.' And I say 'Well, who have you had?' (participant E09).

For those who were successful in making change, the support of managers and involvement of others were key to implementing the guidelines. Clinicians in aged care and public hospital settings reflected on the team effort.

> …it was really a team effort at the end of the day. (participant S13).

> …identifying your local heroes and putting responsibility on other people …, 'this isn't just me doing this. This is us doing this' (participant E11).

Others were able to align the improvements with organisational strategies and structures and gain support from others. In hospital settings with quality improvement structures, this alignment made the process feasible and provided both accountability and recognition.

> … it crosses over many of the domains from the organisational point of view and accountability…. It's been great to have that recognised (participant C06).

External and internal context changes led six clinicians (13%) to withdraw from the programme. Two had personal family circumstances that led them to leave their work and participation in the programme. Others were related directly to organisational changes.

> Funding changes at a national level resulted in significant organisational and role changes and stress for two clinicians in aged care settings.

> …the sector is facing quite dramatic reform…our focus upon managing dementia in the community, may not be a priority going forward (participant S06).

That led to changes in the level of support available from their managers.

> …the support from management is very limited because their energy is all being focused on the (organisational) change itself… (participant S02).

In public hospitals, time constraints impacted on the level of inter-disciplinary team support, with one clinician withdrawing due to tensions in the team.

> the dynamics were more difficult than I had anticipated, and making any change was going to alienate me (participant O08).

Those who withdrew were disappointed to leave, but valued the learning modules, access to peers and research team support.

Mechanisms at work within the collaborative

The initial programme theory was shared with clinicians in the interviews to consider and reflect on their experiences. The 'if…then' propositions were presented to clinicians to assess if and how each applied to them. The mechanisms identified on commencement were generally supported and some were modified on reflection. The structured process of the collaborative provided confidence while a sense of accountability to complete the programme drove commitment to the changes. The

collaborative provided a sense of community and confidence in the process. The credibility of the evidence base and the team of experts and researchers engendered trust and confidence to make changes. An additional mechanism was identified of how achievements were recognised through reflection. Table 4 summarises the mechanisms and reasoning identified.

Integration of results

Post-intervention results were integrated and compared with the pre-intervention results to identify where they confirmed, refuted or suggested the programme theory needed revision.

While results from the QIKAT-R survey showed modest improvement in knowledge of quality improvement methods, data from interviews provided examples from clinicians across settings that they gained knowledge and skills in quality improvement.

The results from the NOMAD survey confirmed that clinicians were engaged with the changes and made efforts to involve others in implementing changes. All clinicians agreed that audit reports and feedback on implementation plans helped them to modify practice and deliver changes. The interview data confirm the value of reflective practice to clinicians to consider gaps and to monitor progress in changes.

Table 5 presents a summary of how the qualitative and quantitative results aligned to confirm, refute or lead to revisions of the programme theory.

A refined programme theory was developed and is presented in figure 1B. Support through the QIC built confidence (mechanism) for most clinicians to make changes (outcome) despite constraints and scepticism (context). When support was lacking in their setting, those constraints led some to withdraw or only partially complete the implementation. The credibility of the experts (context) encouraged trust in the process and the confidence (mechanism) of clinicians to commit to improving dementia care (outcome). Review processes (context) enabled reflection and recognition of efforts (mechanism) in improving dementia care (outcome).

DISCUSSION

A realist informed approach provided insights into how, why and under what circumstances a trial QIC built knowledge and skills in clinicians working in dementia care. The QIC attracted clinicians with a passion to improve dementia care in a context of resource constraints and pessimism about the benefits of interventions to improve quality of life. Devi and colleagues have identified how the multiple types of staff, the prescribed roles and differences about priorities, and negative perceptions around care homes, impacted on the use of QICs in UK.[63] Similar contextual influences were seen across services providing dementia care in this study. The QIC provided resources and opportunities for clinicians that were not usually available in their setting and met their needs for support,

Table 4 Summary of mechanisms identified by clinicians at the conclusion of the programme, with example quotations

	Public hospital services N=10	Residential and community aged care N=4	Private practitioners N=2
Motivation and confidence to engage in change	Structured and supportive process assisted engagement 'I just felt motivated throughout the process because I knew I had the support of your team, so the expertise and leadership' O13 'OTs love structure. The structure was very good, so that was great' O09	Structured and supportive process was flexible and assisted engagement '…it made it more appealing, and easier to engage with' O04 '…the confidence of having other people check your work and give you the seal of approval' E13.	Relevant and useful approach made steps practical '…could go in and do parts of it and then come back to it, that made it a lot easier to fit it in to work' C05
Accountability strengthened commitment to change	Fitted in with organisational and time requirements 'it crosses over many of the domains from the organisational point of view and accountability point of view' C06	Maintained engagement and accreditation 'I was much more motivated to do it, I felt like it had work outcomes and a personal outcome' C07	Maintained engagement and accreditation 'It was actually you guys kind of driving us to get the work done. Which is a good motivating factor for people like me who get distracted easily' E13
Sense of identity reinforced	Professional evidence-based practice 'having an external auditor to come through and look at that and feel that it was a good project. And having great outcomes is really positive to hear too' S13	Advocate for improved quality of services for people with dementia '…chose to work in aged care. I knew I was doing it for my residents, and to help support the staff' E11	Professional competence in dementia 'even though I've sort of worked within an ageing population for a long time, I really wanted to know what best practice was' O07
Doing it together/collective learning increased confidence	Value of sharing perspectives and learning from others for improvement Initial learning from others increased confidence 'I think we kind of talked a lot at the beginning and then you kind of found your feet and you knew what you were doing' C01	Overcoming isolation and gaining support Motivating by working with like-minded others 'It's nice to have people who … have similar mindsets and being able to bounce ideas off of them' O04	Sense of community and overcoming isolation Confidence in practice it's always good to get other people's ideas and feedback. Working in a private practice, if that's all you are doing, it can be quite isolating' O07
Credibility built trust and confidence in process	Trustworthy, evidence base, aligns with organisation needs Research accepted by professional bodies Voice of experts by experience of dementia respected 'I think the value to an organisation with the quality improvement expertise, the training, the contact, the researchers and the PD development I think is extremely valuable' C06	Evidence based CPD points through a work project Perspective of people with dementia useful 'I think it was helpful to see that evidence of there being different types of experts' E10 'you're getting your CPD points and you're learning while you're at work, in work time' C01	Evidence base and acceptance by professional body Validity of improvements and connection with research 'It was incredibly important for me' C05
Reflection on efforts helped recognise achievements	Alignment of organisational goals and improvement in services 'I think it's the thing of linking it back to the different strategic visions and values' C06	Influencing wider service change '…take my knowledge and my actions and my words, and influence others around me' E11	Satisfaction with competence and professional value '…that's improved my practice and sense of empowerment I guess, working with clients with dementia and their carers' C05

CPD, continuing professional development.

Table 5 Integration of main findings and alignment with programme theory

Programme theory	Mechanisms	NPT	QIKAT-R	Contextual factors
Motivated clinicians join	High agreement	High agreement	High agreement (low scores)	High need
Collect data and engage in learning	High agreement	Medium agreement	Unclear (low scores)	High impact of constraints
Incentive offered	Medium agreement (CPD)	Medium agreement	No connection	Low/ medium value
Learn online with others	Medium agreement (flexibility)	Medium agreement (engagement)	Unclear (high learning not shown in scores)	Medium value
Collaborate with peers	Medium agreement (sense of community)	Medium agreement (connection with others)	Unclear (sharing of learning not shown in scores)	High need to reduce isolation
Advice, feedback from experts and researchers	High agreement (credibility and authority)	Medium agreement (collective action)	Low: scores did not reflect learning	High need for coaching
Apply QI steps and adjust	Medium influence	Medium collective action	Low: scores did not reflect learning	Medium influence due to low cost/ small scale changes
QI process is accepted benefits seen	Medium agreement (ownership and commitment)	Medium agreement (collective action)	Low: scores not reflected in process	Medium support of changes in own settings
Results promote awareness and benefits	Medium agreement (recognition and empowerment	Medium level of embedding	Low: scores not reflected in learning	Medium interest in organisations

CPD, continuing professional development; NPT, normalisation process theory; QI, quality improvement; QIKAT-R, quality improvement knowledge assessment tool.

coaching, practice reflection and a flexible structure. They valued the credibility of the programme, the flexible approach which suited their work needs and the process of trying out changes before adopting a new practice. By being part of a dementia specific collaborative with access to experts and peers for support and advice, they developed confidence to pursue change in practice. Access to experts-by-experience of dementia and clinical experts convinced clinicians of the benefits and empowered them to challenge preconceived ideas and routine practice. When their personal motivation aligned with organisational structures and resources, clinicians successfully built the knowledge and skills to implement significant systems improvements and were recognised for their achievements.

Others were able to change their practice for the selected recommendations of the guidelines and reported improvements for their clients. Many faced contextual barriers through time and resource constraints, manager or team resistance, major organisational restructures, and policy changes. While some clinicians withdrew due to contextual barriers, most gained knowledge, skills and the confidence to engage in quality improvement which improved practice in their setting. There was a sense of empowerment for many clinicians in overcoming barriers to change. Six mechanisms in the QIC were identified: motivation, accountability, identity, collective learning, credibility and reflective practice. The relationships

between context, mechanisms and outcomes showed how components of the QIC worked to build a sense of identity and confidence to challenge preconceived ideas of what was beneficial for people with dementia. The flexible, on-line delivery and guidance of the QIC programme made the process acceptable and feasible for most clinicians.

While QICs have been studied extensively, implementation has differed and outcomes have been inconsistent.[10 64] Few studies have used a realist approach[33] or explored the use of collaboratives to improve quality in dementia care.[34] Applying a theory-based evaluation to understand how and why a QIC built knowledge and skills in clinicians, is key to capacity building[65] and identifying strategies for knowledge translation efforts in dementia care.

By bringing clinicians together from different care settings, who work with people with different severity of dementia, the QIC provided opportunities to work on a range of quality improvement activities to suit their settings. This study advances the understanding of how components of QICs contribute to success and why they matter to clinicians in dementia care. It offers an understanding of how support from peers and experts, and reflective practice in collaboratives worked specifically in dementia care, where clinicians are often isolated, there is pessimism about potential gains of interventions for people with dementia and resistance from coworkers.

Adherence to the three key guidelines was sustained over the 9 months of the trial as reported separately.[40] The online modules for learning have been made publicly available for clinicians to use, and with increased uptake will be monitored regularly. The findings offer insights to inform the design of future QICs to further spread clinical guidelines for dementia.

Evaluation strengths and limitations

The use of realist-informed process evaluation was a key strength. A theory-led framework analysis offered perspectives of context, implementation process and mechanisms at work within the collaboratives. The mixed-methods design offered the opportunity to gather rich qualitative and quantitative data to examine how QICs work.

A limitation of this evaluation was the use of the QIKAT-R survey to measure knowledge about quality improvement. The survey was presented in a way that led to participants focusing on clinical responses rather than a process improvement approach, resulting in low scores. The interview data provided stronger evidence of improved knowledge and skills. Small numbers of participants in the evaluation limited statistical analysis but still offered a rich exploration of the mechanisms and contextual factors affecting their learning.

CONCLUSION

This study addresses a strategy to improve dementia care. A QIC designed to suit geographically dispersed clinicians in different settings and roles was acceptable and feasible in building knowledge and skills to improve dementia care. The motivations of clinicians and the credibility of the collaborative process empowered clinicians to counter pessimism to improve dementia care. This offers insight into how preconceived ideas of what is possible in dementia care in complex and resource constrained contexts can be overcome.

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REFERENCES

1 Chan WV, Pearson TA, Bennett GC, et al. ACC/AHA Special Report: Clinical Practice Guideline Implementation Strategies: A Summary of Systematic Reviews by the NHLBI Implementation Science Work Group: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol* 2017;69:1076–92.

2 OECD. *Care needed: improving the lives of people with dementia*. Paris: OECD, 2018.

3 Groves A, Thompson D, McKellar D. *The Oakden report*. Adelaide, South Australia: SA Health, Department for Health and Ageing, Health S, 2017.

4 Royal Commission into Aged Care Quality and Safety. *Interim report. Adelaide*, 2019.

5 Sedney C, Kurowski-Burt A, Smith M, *et al*. Therapeutic nihilism of neurological diseases: a comparative qualitative study. *J Clin Neurosci* 2019;69:124–31.

6 Banerjee S, Wittenberg R. Clinical and cost effectiveness of services for early diagnosis and intervention in dementia. *Int J Geriatr Psychiatry* 2009;24:748–54.

7 MacLeod CA, Bu F, Rutherford AC, *et al*. Cognitive impairment negatively impacts allied health service uptake: investigating the association between health and service use. *SSM Popul Health* 2021;13:100720.

8 World Health Organisation. *Global action plan on the public health response to dementia 2017 - 2025*. Geneva: World Health Organisation, 2017.

9 Morley JE, Caplan G, Cesari M, *et al*. International survey of nursing home research priorities. *J Am Med Dir Assoc* 2014;15:309–12.

10 Wells S, Tamir O, Gray J, *et al*. Are quality improvement collaboratives effective? A systematic review. *BMJ Qual Saf* 2018;27:226.

11 Institute for Healthcare Improvement. *The Breakthrough Series : IHI's Model for Achieving Breakthrough Improvement*. Cambridge Massacheusetts: Institute for Healthcare Improvement, 2003.

12 Nadeem E, Olin SS, Hill LC, *et al*. Understanding the components of quality improvement Collaboratives: a systematic literature review. *Milbank Q* 2013;91:354–94.

13 Shaw EK, Chase SM, Howard J, *et al*. More black box to explore: how quality improvement collaboratives shape practice change. *J Am Board Fam Med* 2012;25:149.

14 Schouten LMT, Hulscher MEJL, van Everdingen JJE, *et al*. Evidence for the impact of quality improvement Collaboratives: systematic review. *BMJ* 2008;336:1491–4.

15 de la Perrelle L, Radisic G, Cations M, *et al*. Costs and economic evaluations of quality improvement collaboratives in healthcare: a systematic review. *BMC Health Serv Res* 2020;20:155.

16 Devi R, Meyer J, Banerjee J, *et al*. Quality improvement collaborative aiming for proactive healthcare of older people in care homes (peach): a realist evaluation protocol. *BMJ Open* 2018;8:e023287.

17 Zubair M, Chadborn NH, Gladman JRF, *et al*. Using comprehensive geriatric assessment for quality improvements in healthcare of older people in UK care homes: protocol for realist review within proactive healthcare of older people in care homes (peach) study. *BMJ Open* 2017;7:e017270.

18 Mittman BS. Improving the quality of dementia care: the role of education. *Clin Gerontol* 2006;29:61–9.

19 Wilson T, Berwick DM, Cleary PD. What do collaborative improvement projects do? experience from seven countries. *Jt Comm J Qual Saf* 2003;29:85–93.

20 Mittman BS. Creating the evidence base for quality improvement collaboratives. *Ann Intern Med* 2004;140:897–901.

21 Schouten LM, Hulscher ME, van Everdingen JJ, *et al*. Short- and long-term effects of a quality improvement collaborative on diabetes management. *Implement Sci* 2010;5:94.

22 Hulscher MEJL, Schouten LMT, Grol RPTM, *et al*. Determinants of success of quality improvement Collaboratives: what does the literature show? *BMJ Qual Saf* 2013;22:19–31.

23 Brown V, Fuller J, Ford D. *The enablers and barriers for the uptake, use and spread of primary care Collaboratives in Australia*. Herston, QLD: APHCRI Centre of Research Excellence in Primary Care Microsystems, Discipline of General Practice, The University of Queensland, 2014.

24 Gustafson DH, Quanbeck AR, Robinson JM, *et al*. Which elements of improvement collaboratives are most effective? A cluster-randomized trial. *Addiction* 2013;108:1145–57.

25 Dückers MLA, Spreeuwenberg P, Wagner C, *et al*. Exploring the black box of quality improvement Collaboratives: modelling relations between conditions, applied changes and outcomes. *Implement Sci* 2009;4:74.

26 Algurén B, Nordin A, Andersson-Gäre B, *et al*. In-Depth comparison of two quality improvement collaboratives from different healthcare areas based on registry data-possible factors contributing to sustained improvement in outcomes beyond the project time. *Implement Sci* 2019;14:74.

27 Dixon-Woods M, Bosk CL, Aveling EL, *et al*. Explaining Michigan: developing an ex post theory of a quality improvement program. *Milbank Q* 2011;89:167–205.

28 Zamboni K, Baker U, Tyagi M, *et al*. How and under what circumstances do quality improvement collaboratives lead to better outcomes? A systematic review. *Implement Sci* 2020;15:27.

29 Shearn K, Allmark P, Piercy H, *et al*. Building realist program theory for large complex and messy interventions. *Int J Qual Methods* 2017;16:160940691774179.

30 Rycroft-Malone J, Seers K, Eldh AC, *et al*. A realist process evaluation within the facilitating implementation of research evidence (fire) cluster randomised controlled international trial: an exemplar. *Implement Sci* 2018;13:138.

31 Willis CE, Reid S, Elliott C, *et al*. A realist evaluation of a physical activity participation intervention for children and youth with disabilities: what works, for whom, in what circumstances, and how? *BMC Pediatr* 2018;18:113.

32 Brand SL, Quinn C, Pearson M, *et al*. Building programme theory to develop more adaptable and scalable complex interventions: realist formative process evaluation prior to full trial. *Evaluation* 2019;25:149–70.

33 Handley M, Bunn F, Goodman C. Dementia-friendly interventions to improve the care of people living with dementia admitted to hospitals: a realist review. *BMJ Open* 2017;7:e015257.

34 Dixon N, Wellsteed L. Effects of team-based quality improvement learning on two teams providing dementia care. *BMJ Open Qual* 2019;8:e000500.

35 Pawson R, Tilley N, eds. *Realistic evaluation*. London: Sage, 1997.

36 Ogrinc G, Batalden P, Moore S. Realist Evaluation as a Framework for the Assessment of Teaching About the Improvement of Care/ Commentary on "Realist Evaluation as a Framework for the Assessment of Teaching About the Improvement of Care". *Journal of Nursing Education* 2009;48:661–7.

37 Moore GF, Audrey S, Barker M, *et al*. Process evaluation of complex interventions: Medical Research Council guidance. *BMJ* 2015;350:h1258.

38 Maben J, Taylor C, Dawson J, et al. A realist informed mixed-methods evaluation of Schwartz center Rounds® in England. *Health Services Delivery Research* 2018;6:37.

39 Bernet AC, Willens DE, Bauer MS. Effectiveness-implementation hybrid designs: implications for quality improvement science. *Implementation Sci* 2013;8:S2.

40 Laver K, Cations M, Radisic G, *et al*. Improving adherence to guideline recommendations in dementia care through establishing a quality improvement collaborative of agents of change: an interrupted time series study. *Implement Sci Commun* 2020;1:80.

41 Cations M, Crotty M, Fitzgerald JA, *et al*. Agents of change: establishing quality improvement collaboratives to improve adherence to Australian clinical guidelines for dementia care. *Implement Sci* 2018;13:123.

42 Scott SD, Rotter T, Flynn R, *et al*. Systematic review of the use of process evaluations in knowledge translation research. *Syst Rev* 2019;8:266.

43 Salter KL, Kothari A. Using realist evaluation to open the black box of knowledge translation: a state-of-the-art review. *Implement Sci* 2014;9:115.

44 Booth A, Wright J, Briscoe S. Scoping and Searching to Support Realist Approaches. In: *Doing realist research*. 55 City Road, London: SAGE Publications Ltd, 2018. https://methods.sagepub.com/book/doing-realist-research

45 Berwick DM. The science of improvement. *JAMA* 2008;299:1182.

46 The Health Foundation. *Evidence scan: quality improvement training for healthcare professionals*. London: The Health Foundation, 2012.

47 The Heart Foundation. *Perspectives on context. research report*. London: The Heart Foundation, 2014.

48 Wong G, Greenhalgh T, Westhorp G, *et al*. Realist methods in medical education research: what are they and what can they contribute? *Med Educ* 2012;46:89–96.

49 Creswell JW, Fetters MD, Ivankova NV. Designing a mixed methods study in primary care. *Ann Fam Med* 2004;2:7–12.

50 Singh MK, Ogrinc G, Cox KR, *et al*. The quality improvement knowledge application tool revised (QIKAT-R). *Acad Med* 2014;89:1386–91.

51 Finch TL, Girling M, May CR, *et al*. *Normalization Process Theory On-line Users' Manual, Toolkit and NoMAD instrument [Measurement instrument*. UK: NPT 2015 [NoMAD toolkit]. http://www.normalizationprocess.org

52 Damschroder LJ, Aron DC, Keith RE, *et al*. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci* 2009;4:50.

53 May C, Finch T. Implementing, embedding, and integrating practices: an outline of normalization process theory. *Sociology* 2009;43:535–54.

54 Pawson R, Manzano-Santaella A. A realist diagnostic workshop. *Evaluation* 2012;18:176–91.
55 Manzano A. The craft of interviewing in realist evaluation. *Evaluation* 2016;22:342–60.
56 Sullivan GM, Artino AR. Analyzing and interpreting data from likert-type scales. *J Grad Med Educ* 2013;5:541–2.
57 NVivo 12 [Internet]. QSR Intrenational Pty Ltd, 2018. Available: https://www.qsrinternational.com/
58 Fletcher AJ. Applying critical realism in qualitative research: methodology meets method. *Int J Soc Res Methodol* 2017;20:181–94.
59 Furber C. Framework analysis: a method for analysing qualitative data. *Afr J Midwifery Womens Health* 2010;4:97–100.
60 Smith JD, Li DH, Rafferty MR. The implementation research logic model: a method for planning, executing, reporting, and synthesizing implementation projects. *Implement Sci* 2020;15:84.
61 Bergeron DA, Gaboury I. Challenges related to the analytical process in realist evaluation and latest developments on the use of NVivo from a realist perspective. *Int J Soc Res Methodol* 2020;23:355–65.
62 Guetterman TC, Fetters MD, Creswell JW. Integrating quantitative and qualitative results in health science mixed methods research through joint displays. *Ann Fam Med* 2015;13:554–61.
63 Devi R, Martin G, Banerjee J, *et al*. Improving the quality of care in care homes using the quality improvement collaborative approach: lessons learnt from six projects conducted in the UK and the Netherlands. *Int J Environ Res Public Health* 2020;17:20.
64 Robert G, Sarre S, Maben J, *et al*. Exploring the sustainability of quality improvement interventions in healthcare organisations: a multiple methods study of the 10-year impact of the 'Productive Ward: Releasing Time to Care' programme in English acute hospitals. *BMJ Qual Saf* 2020;29:31–40.
65 Knight AW, Dhillon M, Smith C, *et al*. A quality improvement collaborative to build improvement capacity in regional primary care support organisations. *BMJ Open Qual* 2019;8:e000684.
66 Dalkin SM, Greenhalgh J, Jones D, *et al*. What's in a mechanism? Development of a key concept in realist evaluation. *Implement Sci* 2015;10:49.
67 Emmel N, Greenhalgh J, Manzano A, *et al*. *Doing realist research*. London: Sage, 2018.
68 Lacouture A, Breton E, Guichard A, *et al*. The concept of mechanism from a realist approach: a scoping review to facilitate its operationalization in public health program evaluation. *Implement Sci* 2015;10:153.
69 Coury J, Schneider JL, Rivelli JS, *et al*. Applying the Plan-Do-Study-Act (PDSA) approach to a large pragmatic study involving safety net clinics. *BMC Health Serv Res* 2017;17:411.