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How can we improve Comprehensive Geriatric Assessment for older people living with frailty in primary care and community settings? A Qualitative Study

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Abstract

Objective

With advancing age comes the increasing prevalence of frailty and increased risk of adverse outcomes (e.g. hospitalisation). Comprehensive Geriatric Assessment (CGA) is a multi-dimensional holistic assessment that includes physical, cognition and psychosocial components. International evidence shows positive outcomes from CGA use in the community. This study aimed to explore how to improve the current CGA, and the factors needed to implement it in the community in England.

Design

A qualitative interview study with older people over 75 years and health care professionals. Data were analysed using an abductive analysis approach.

Setting

England, United Kingdom

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Results

Twenty-seven people were interviewed, constituting 14 older people and 13 healthcare professionals (HCPs). We identified limitations in the current CGA: a lack of information sharing between different healthcare professionals who deliver CGA; poor communication between older people and their HCPs; and a lack of follow-up as part of CGA. When we discussed the potential for CGA to utilise technology, HCPs and older people varied in their readiness to engage with it.

Conclusions

Viable solutions to address gaps in the current delivery of CGA include the provision of training and support to use digital technology and a designated comprehensive care coordinator. The next stage of this research will use these findings, existing evidence and stakeholder engagement, to develop and refine a model of community based CGA that can be assessed for feasibility and acceptability.

Keywords

Ageing, comprehensive geriatric assessment, digital technology, frailty, qualitative.

Strengths and Limitations

- Use of qualitative interviews enabled rich data on exploration and synthesis of older people and healthcare professionals.
- Our theoretically informed qualitative research and stakeholder insights identified both challenges to the current delivery of CGA as well as opportunities for the improvement of CGA for older people with frailty.
- Our study is deliberately exploratory; thus the findings may not be transferable to other older and healthcare professionals. However, we recruited older people with frailty and HCPs with a wide variety of views and experiences.

Introduction

Between 2020 and 2050 the number of people aged over 80 will triple to reach 426 million (1). With ageing, people are more susceptible to develop multiple, complex conditions that reduce their independence and quality of life (1-4). This is due to underlying factors, such as falls, frailty, and delirium (1, 3).

Frailty is a clinical syndrome where multiple body systems deteriorate leading to increased vulnerability (3, 5). Frailty increases the risk of falls, disability, hospitalisation, mortality, and contact with healthcare services (5, 6). Prevention and reversal of frailty can enable people to stay well and live independently for longer (3). Frailty affects half of the UK population aged over 85 and costs the NHS £5.8 billion per year (6). Older people with frailty need robust interventions that respond to the complexity of their condition (3, 7). Comprehensive Geriatric Assessment (CGA) delivered in acute, primary and community settings aims to prevent deterioration and complications associated with frailty (3, 8). CGA is a multi-dimensional diagnostic and therapeutic intervention that includes a comprehensive assessment of physical, cognitive and psychosocial components with the development of a holistic management plan in partnership with the older person with frailty (7). Evidence for the effectiveness of CGA for older people with frailty in community from recent systematic reviews is mixed (7, 9, 10). Ho et al reported benefits in terms of the likelihood of living at home, reduced mortality, improved cognition, and activities of daily living, but with uncertain benefits on quality of life (10). Whereas Briggs and colleagues found no difference in mortality, activities of daily living, quality of life and care home admissions (7).

A key priority of the National Health Service (NHS) in the UK is to support older people with frailty in managing their long-term conditions (3, 11). Regardless of the complexity and diversity of the needs of older people with frailty, some are facing inequity in access to interventions which, if accessed, may help to maintain their independence (3). Thus, there is a need to ensure that CGA best meets the needs of all older people living with frailty, without compromising safety and efficacy.

Recent NHS initiatives to strengthen the efficiency of outpatient services using non-face-to-face approaches require consideration. For example, there is growing interest in the use of wearable devices to monitor patients (11). The NHS Long Term Plan and Digital Transformation Plan recommend the use of digital equipment in the assessment and monitoring of older people with frailty; with the option of using wearable devices to ensure services are inclusive and available to all (11, 12).

Improving the effectiveness and efficiency of CGA (10) requires exploration of how individual components may work and how the overall intervention can be enhanced. The Digital and Remote Enhancement for the Assessment and Management of Older People with Frailty (DREAM) project aimed to develop a model for CGA that utilised digital technology. This qualitative paper explores the factors for enhancing CGA in community settings.

Methods

Design

A qualitative interview study with older people and health care professionals. AM collected and analysed the data in collaboration with VG and JF. AM, VG and JF are experienced qualitative researchers from different professionals backgrounds (physiotherapist, pharmacist and nurse). Ethical approval was issued by the University of Exeter, College of Medicine and Health Research Ethics Committee (Ref 509407). The study has been reported according to the Consolidated Criteria for Reporting Qualitative Study (COREQ) guidelines (13).

Stakeholder engagement

Patient Public Involvement and Engagement (PPIE) representatives and Health and Care Professional (HCP) stakeholders contributed to the development, design and conduct of this research. They

contributed to developing and piloting topic guides for the interviews and provided analytical insight into preliminary findings.

Sampling and Recruitment

We employed a maximum variation sampling strategy (14) to capture diversity in gender, ethnicity, living circumstances, socioeconomic factors, geography, frailty, sensory (e.g. visual or hearing problems), and memory problems of older people with frailty. For healthcare professionals, we also used a maximum variation sampling strategy (14), to ensure representation of professional background, geographical location, and gender.

We invited 132 community-dwelling older people, who had participated in either the Community Ageing Research (CARE) 75+ (15) or the Oxford Pain Activity and Lifestyle (OPAL) (16) cohort studies, to be interviewed. Both CARE 75+ and OPAL cohorts provide older people who were representative and diverse geographical, ethnic backgrounds. We invited health and social care professionals working in non-hospital settings in the UK working with older people living with frailty via social media (Twitter and Facebook) and via professional networks. AM had no previous contact with any of the participants. The interviews were conducted face-to-face, via telephone or video call, depending on the participants' preference (14).

Data collection

We developed semi-structured topic guides (14, 17) for older people (Additional file 1) and HCPs (Additional file 2) based on a review of literature, discussions with our older people and family members, and HCP stakeholders. Topic domains were aligned to the Non-adoption, Abandonment, Scale up, Spread and Sustainability (NASSS) framework to ensure collection of rich data (18) to explicitly focus our analysis on how best to improve CGA (18). AM piloted the topic guide with stakeholders and refined one question (concerning outcomes to be measured) for clarity. The topic guide enabled consistency in the data collection, with the interviews flexible enough to allow the participants to explain what was important to them (19). The audio-recorded interviews were

transcribed by a GDPR compliant transcriber and checked for accuracy by AM. Fieldnotes captured the context of the interview.

Data analysis

We undertook abductive analysis (20), and used NVivo (Release 1.7) (21) to manage the data. This involved an iterative approach to analysis, to facilitate understanding (19, 22). We coded the interviews in cycles, with deductive codes from the literature and inductive codes generated by AM, identifying similar ideas or concepts that could be categorised into a code (19, 23). This enabled balance between data relating to pre-existing concepts and data based on the perspectives of the participants (20, 24). We (AM, VG and JF) then developed a conceptual map of the different participants' perspectives (17) before we further categorised the codes using the NASSS framework, and the Theoretical Framework of Acceptability (18, 25), which allowed us to explain complexity within the domains of an intended intervention: CGA that utilises technology. We used the conceptual map to create a hypothetical case (vignette) of an older person who participated in a CGA that used technology (26). We used the vignette in the final three interviews with HCPs, to extend our understanding of the potential afforded by technology.

Results

Interviews took place between May and December 2022.

Older people

Fourteen older people consented to participate and were interviewed. Respondents were aged between 75 and 90 years old, were evenly split between males and females, and included participants with hearing and/or visual impairment, mobility impairments, and with one or more long term condition. One participant asked to be interviewed in the presence of their carer (a spouse). The interviews lasted between 16 and 92 minutes . (Table 1).

Table 1 Demographic characteristics of older people with frailty

Participant Pseudonym	Gender	Age	Current residence in England	Living circumstances	Mode of interview
Robert	Male	84	North East	Live alone	Telephone interview
James	Male	83	South West	Live alone	In-person interview
Richard	Male	82	South West	Live with spouse	Online audio call
William	Male	90	North East	Live with spouse	Online video call
Barbara	Female	82	North East	Live with spouse	Telephone interview
Gary	Male	76	North East	Live with spouse	Telephone interview
Karen	Female	79	South East	Live alone	Online video call
Steven	Male	75	South East	Live with spouse	Telephone interview
Shirley	Female	79	Midlands	Live alone	Telephone interview
Frances	Female	89	South East	Live alone	Telephone interview
Carol	Female	82	North West	Live alone	Telephone interview
Donna	Female	85	South East	Live alone	Telephone interview
Frank	Male	80	Midlands	Live with spouse	Telephone interview
Lois	Female	86	South West	Live with spouse	Telephone interview

Healthcare professionals

The thirteen HCPs came from different professional backgrounds, and from different geographical areas of England. All of the participants were working, or had worked, with older people with frailty,

for a duration of two to 30 years (Table 2). The interview duration ranged between 33 and 160 minutes .

Table 2 Demographic characteristics for HCPs who participated in the study

Participant number	Profession	Years of providing care to older people	Location in England	Gender	Mode of interview
HP1	Frailty assistant practitioner	20	South West	Female	Online
HP2	Nurse	15	South West	Male	Online
HP3	GP	Retired	North East	Female	Online
HP4	Physiotherapist	19	South West	Female	Online
HP5	GP	16	South West	Female	Online
HP6	Physiotherapist	30	South West	Female	Online
HP7	Nurse	15	South West	Female	Online
HP8	Nurse	2	South East	Female	Online
HP9	Occupational therapist	10	South East	Female	Online
HP10	Consultant Geriatrician	23	North West	Male	Online
HP11	Consultant Geriatrician	19	Midlands	Female	Online
HP12	Physiotherapist	4	Midlands	Female	Online

HP13	Pharmacist	3	North West	Female	Online

(18, 25) Here we present the four domains that were most important for both the patient and professional participants: frailty (the condition), intended adopters (both professional and lay), organisational factors (such as workforce challenges), and acceptability (of aspects of technology and assessment).

Frailty

Amongst HCPs, there was an appreciation of the complexity of frailty as a condition. Regardless of whether they have an acute condition or not, all older people with frailty have complex needs due to having multiple long-term conditions, impairments and/or socioeconomic factors:

> *"Most of them are aged 80 almost all of them are frail and so they have multiple chronic conditions, they have got polypharmacy they tend to need some help with one or more activities of daily living". (HP13, Pharmacist)*

HCPs from different professions tend to provide a comprehensive assessment that involves physical, psychological and social needs for older people with acute and non-acute conditions. However, there is a need to provide older frail people with assessment prior to a crisis developing:

> *"All the domains yeah, the psychological, physical all those you know functional, environmental you know do you live in a house, a flat, bungalow, do you sleep upstairs, any falls you know any equipment in the toilet, that kind of thing and social you know do you get out." (HP12, Physiotherapist)*

> *"So, if you're trying to keep somebody weller for longer, then any of those proactive interventions rather than waiting until they get to crisis point." (HP9, Occupational therapist)*

We interviewed older people with frailty who were socioeconomically disadvantaged and/or experienced sensory or physical impairment that can exacerbate the complexity of their condition.

For example, Carol had financial challenges, restricted mobility, visual impairment, multiple long-term conditions, and a high risk of falling. Carol had limited choices in access to care, because of her restricted ability to travel to appointments, lack of a support network, and no access to technology:

> *"I've been a single person all my life and I get the basic state pension. So, I've never ever been able to afford the technology that people use every day to day in these days and that's the reason I don't have it." (Carol, 82 years old)*

In contrast, Karen lived alone, but has regular communication with family and friends. During her health and care journey, Karen was able to enact her own health decisions and avoided long NHS waiting time for tests and referrals:

> *"I only saw the consultant yesterday, so the next steps haven't been put in place yet. Unfortunately, I have had to pay privately for it and the NHS seems to be in such a mess and the doctor did want to send me off for tests but she couldn't justify so, more or less saying well you know it is as it is we can't do anything more for you because we haven't got proof that this test or that test is something we can do, something we can justify. […] I'll have to pay for that privately otherwise I will just be waiting too long. You know I am getting on I don't want the last two or three years probably of my life to be sitting around at home feeling sorry for myself." (Karen, 79 years old)*

Intended adopters

Some HCPs indicated that an HCPs occupational background may inform the scope of assessment during the CGA, and the quality of the CGA that they offer. A nurse who led a frailty team showed appreciation of the range of HCP backgrounds in their team, which enabled them to involve the most suitable HCP (e.g. in terms of their skill set), to meet the unique needs of the older person:

> *"obviously if it was things like their ability to perform their physical activity to daily living that maybe something that I would involve one of, I've got a colleague who is Band 4 assistant practitioner whose got a therapy background she's very good at looking at the nuts and bolts of how people physically manage […] I will also do joint visits with OTs and physios if we're feeling that we need to, that there's a, that the referral makes it sound like this is very much that mixed picture of it's not just a medical requirement or a strict nursing*

requirement that there's an overlap with where my therapy colleagues would come in". (HP2, Nurse)

This contrasted with the view of a consultant geriatrician (HP11) who also led a frailty team. HP11 indicated that regardless of the different backgrounds of HCPs in their team, there should be no differences in the CGA that they provide to older people with frailty. However, HP11 highlighted that some professions may have limited ability to understand the complexity of older people's condition. This was congruent with the views from older people who thought that their condition could be managed better by an HCP with knowledge and experience of older people with frailty:

"They all do the same because they've all had their advanced […], course the advanced assessment healthcare assessment course. They've all done the same course ok,". (HP11, Consultant Geriatrician)

"You could have one doctor who is in the practice who specialised in old people you know just for the aged to sort of he specialised in the aged. […] where old people could feel they could go […] rather than a general practitioner maybe somebody that was for the old and the frail." (Barbara, 82 years old)

In contrast, a GP (HP3) thought that the ability to deliver CGA depends upon the investigative and communication skills, and previous experience of staff, and it is not restricted to a particular background:

"So, I tend to work on a concept that I don't like thinking about professions doing things I like to think about competencies." (HP3, GP)

Some HCPs suggested that HCPs may require training to improve interpersonal skills, in terms of communication and attention to detail, to ensure enhancement of CGA. For example, HP12 (a Physiotherapist) shared their personal experience of developing their investigational skills when providing remote CGA over time. HP7 (a Nurse) shared their experience of supporting new HCPs in their team to learn how to pick-up non-verbal cues during home visits, to support identifying care needs and provide CGA.

Organisation

Interviewing HCPs from different geographical areas of England allowed us to explore organisational limitations, which would require innovation to increase readiness for new forms of technology-informed care delivery.

Some HCPs made references to fear and resistance to trying new ways of care delivery. For example, a nurse (HP2) referred to themselves as 'a dinosaur' when it comes to trying new technologies. Similarly, a frailty assistant practitioner (HP1) also indicated that practitioners may need support from colleagues, while a consultant geriatrician (HP11) shared the challenges they had when using technology and the time needed for training to use new technology:

> *"There's also the training aspect of it training takes a long time you go in and sit down and have training whatever new technology comes you have to find time to go for training and you actually don't get to understand its use until you start using it and the problems that you get when you start using it". (HP11, Consultant Geriatrician)*

Almost all HCPs discussed the negative impact of using different clinical databases in various settings on their ability to share and/or access patients' records. HCPs discussed the importance of having a well-established information sharing process between HCPs in different settings in enhancement of CGA. HCPs shared their experiences of meeting the challenges in information sharing. For example, sharing data in regular Multi-Disciplinary Team (MDT) meetings, provides access to the GP medical records for HCPs who work in the community, which enables them to effectively support the older people with whom they work. Some organisations have a sharing document that all HCPs involved in CGA can use to input and share data, which staff found beneficial in terms of the availability of information and efficiency in obtaining key information when needed:

> *"I've not seen they've had a CGA, their clinical frailty scale is this, blah, blah, blah never seen it never ever. Never ever, ever seen it. So, information is not coming it is not flowing". (HP12, Physiotherapist)*

> *" I just from previous experience I knew these sorts of things I needed to have so I made sure that I discussed it with the CGG and got them to put this in place because I didn't want to be spending exactly like the nurse, two hours, trying to get information when in five minutes I can have that information." (HP10, Consultant Geriatrician)*

> *"So, for me to be able to know what medicines somebody is on, I have to have access to that or I've got ask somebody who has access to check for me ok". (HP11, Consultant Geriatrician)*

Lack of staff capacity was perceived as a limitation for delivering CGA by all HCPs, which may inhibit delivery of timely support which an older people may require. Some older people recognised the limited staff availability and the increasing demands on the GP practices that inhibit continuity in care. For them, lack of continuity decreases their engagement with their care:

> *"More of us, more availability [..] I mean we are running its sort of like a virtual ward model but it's going to be, we have less staff on at a weekend. So, our capacity to take new referrals on a Friday and over the weekend is a lot less." (HP9, Occupational therapist)*

> *""When you see the doctor, you know you barely it's a locum that I see I don't see my own doctor."." (Shirley, 79 years old)*

In contrast, other older people with frailty understood the current workforce challenges in the NHS and suggested that improved communication between HCPs and sharing information may mitigate the current lack of continuity:

> *"GPs talk to each other and that you know if you go in and you see somebody who is not your designated GP you know that fine well that the notes are there […]. So, you feel perfectly happy that you know whoever you are seeing, knows what they are talking about." (Lois, 86 years old)*

However, we identified that when an older person can identify a key contact person to support them, this can mitigate a lack of continuity in their care, because they key person can co-ordinate their care and ensure the continuous flow of communication:

> *"So, I sort of stayed involved in this case as a coordinating factor because you know it happens when too many people are involved things the outcome might not be good or the people can get lost in translation and so I managed to speak to the mental health team and everything and draw all the people that the GP had referred to, to a point where I said now, you need to take this forward." (HP12, Physiotherapist)*

Acceptability

We identified elements that might influence acceptability by older people with frailty, that should be taken into consideration when enhancing CGA.

Although HCPs perceived that older people were satisfied with CGA and the care provided to them, some older people indicated that they could not freely communicate with HCPs and express their needs, because of perceived short appointments with their GP. Furthermore, older people lacked trust in their HCPs, or the clinical decisions made about their treatment plan:

> *"I would say the consistent feedback is normally that we that they're greatly relieved that we've given the time 'cos we don't time specify our visits" (HP2, Nurse)*

> *"No, it's so quick and it's so, I mean in person, well I wouldn't say personal you know when you speak to a doctor like I did with my old doctor if he, it was just a different attitude towards you, it's like a conveyor belt, you come in, you go out, you come in and you go out so, you know you just feel it's not the same what it was before." (Shirley, 79 years old)*

Moreover, HCPs acknowledged the variation in older people readiness to engage with new ways of care delivery:

> *"There is a high risk of inequalities because anytime you are going introduce something different new, there are going to be people who can use it very easily and there are going to be those who can't for whatever reasons". (HP13, Pharmacist)*

This aligned with the findings from interviews with the older people themselves. For example, Karen showed readiness to engage with new ways of receiving technology-informed care because she had

previous experience of using technology in her healthcare, and in communication with family members. In contrast, Shirley rejected engagement with new forms of remote appointments:

> *"They did ask me once yes, but I said, well, I don't know how to do it, let's put it that way a video appointment I mean I don't […] I have a mobile phone so, you know I just don't know how to do it. So, the other solution was that they speak to me over the phone". (Shirley, 79 years old)*

Lack of physical access to technology (e.g. a device or internet connection) can inhibit an older person's opportunity to learn how to use technology, which may subsequently limit their readiness to engage with new forms of technology informed care. Therefore, those with frailty may require additional support to engage with CGA that utilises technology. For example, older people with sensory impairment may require specialist adaptation to their device, or support from a carer to engage; whereas older people who are already digitally literate may only need educational input on how to use a new technology.

HCPs recognised the variation in the needs and preferences of older people with frailty and discussed how they tailor CGA to the person's needs:

> *"I would say we're able to be very person-centred we're not looking at things from a clinician's perspective only we will explore things from the patient's perspective in terms of what they think is their problems." (HP4, Physiotherapist)*

Some HCPs thought that the presence of a carer, a family member or support network may increase a frail older person's acceptance of CGA that utilises technology. However, HCPs acknowledged the higher demands on the carer which may reduce the support they can provide, to help the older adult engage with technology. A GP (HP3) shared examples of caregivers who inadvertently disempower the older person, in terms of decision-making about their healthcare choices. Older people may therefore require support from a wider network, and not only their carer:

> *"Some of them have families who help them but they still like you know eye contact, physical contact and the written word, you know paper, hard copy of anything. So, I am afraid that's something that they'll eventually all pop off but and thankfully the younger ones are you know quite capable of using all these devices." (Barbara, 82 years old)*

HCPs may not be able to provide the required follow-up after an assessment, important for tracking the referrals to other services if needed and the management plan provided to the patient. Similarly, older people explained the challenges that they were facing in following-up the HCPs; for example, to find out the result of a test, or to book an appointment:

> *"I would like to think we're good at going out and identifying the problem we're good at negotiating a management plan with someone it's then how do you monitor the effect of that management plan". (HP2, Nurse)*

> *"I had to phone my practice after I'd been to see the 111 doctor and she said get in touch with your practice and I got this sort of non-committal reply oh, well you'd better start your antibiotics and I was quite disappointed that they didn't get in touch with me because they'd given me that advice without having seen a report and I thought well I would have expected something to come back but like I said, I was really not well enough to do anything about it". (Donna, 85 years old)*

Discussion

In this study, we identified key challenges to the enhancement of CGA in the community, including: information sharing between different HCPs who are delivering the CGA; communication between older people and their HCPs; and follow-up appointments after conducting the CGA. From the current challenges that were explained by participants, and suggestions which they made to address them, we identified factors to enhance CGA in the community.

Both HCPs and older people considered that the delivery of CGA should not be limited to those from specific professions but should be based upon a HCPs competency and knowledge of the complexity of need for older people with frailty. This finding aligns with the Ageing Well Network of Enhanced

Care for older People (EnCOP) competency framework (27); an aim of which is to enhance staff competency in working anywhere in the care system (27). The Health Education England and NHS England commissioned the Frailty Core Capabilities Framework in 2018 to identify skills and behaviours required to deliver high quality of care to older people with frailty (28). However, there is limited use of the framework in commissioning education or training, reflected in the results of evaluation surveys that were conducted in 2018 and 2019 (29). We suggest that upskilling staff and providing them with appropriate training to improve their communication and investigation skills may be a viable solution to mitigate the negative impact of workforce shortages on the effectiveness of CGA.

From conducting interviews and workshops with stakeholders, we identified the need for assigning a member of staff or MDT team to a co-ordinating role, which we designated as "Comprehensive Care Coordinator". This person could coordinate the delivery of CGA by facilitating information sharing between different HCPs, communicating with older people with frailty on a regular basis, and ensuring that the management plan including referrals is acted upon. Designating a care coordinator may improve continuity of care with one point of contact and provide reassurance through a therapeutic, long-term relationship. This may provide reassurance to the older person and ensure effective follow-up of any management plan. Care coordinator roles in the community, including case managers, may reduce emergencies. However, evidence shows variation in the role in different studies in terms of duration and frequency of home visits and HCPs who coordinated the care (10, 30, 31). Further research needs to identify who could best coordinate care in older people and what the best approach may be.

Moreover, HCPs agreed that utilising technology in the delivery of CGA may enable HCPs to provide support for older people without compromising their follow-up. The NHS plan highlighted the need for enhancing the use of technology in healthcare, to change how care is being provided to patients; and to create joined up computer systems that give staff sufficient access to data, to provide

improved care for patients (11). However, there is a need for digital upskilling of staff to support their effective use of technology in healthcare (32).

Different IT-systems and a lack of information governance arrangements across different settings currently inhibits information sharing and creates tension between HCPs in different settings. HCPs told us that the lack of connection between different systems must be addressed, if they are to deliver an effective CGA. Similarly, older people mentioned how lack of access to information magnified unequal access to effective CGA, and support and care for older people with frailty. In February 2023, NHS Digital became responsible for digital technology, data and health and care delivery. This has the potential to address some of the challenges in information sharing (12). Existing research has identified the need for convenient platforms and improved digital records for integrated care services for older people (including CGA) that maintain privacy and security when sharing patient data between MDTs (32, 33). Such integrated platforms may enhance communication and coordination of care (32, 33). However, resolving existing operational complexities is likely to require additional funding and the creation of interoperable IT-systems (11, 12, 32, 34).

We found that socioeconomic factors, including living circumstances, income, and social network impacted older peoples' treatment choices; in terms of whether they visited a clinical specialist and waiting times for NHS appointments. This implies that when developing the CGA that utilises technology we need to consider how to mitigate socioeconomic factors that inhibit access and capacity to obtain the benefits of using digital equipment in the assessment and follow-up. Existing research suggests that digital interventions are less effective in populations with socioeconomic disadvantage compared with those with higher socioeconomic status (35). Although the COVID 19 pandemic accelerated the shift to online resources and services, and changed patient perceptions and willingness to use technology, it increased digital inequalities (36, 37). Increasing physical access to connected devices and the internet may not be enough to reduce inequalities in access to CGA

that utilises technology (35, 36, 38). Therefore, training and support would be needed to ensure older people could be digitally enabled; however, this may not be appropriate for everyone, and support would need to be individualised (39).

Using technology for monitoring and supporting older people with frailty is an NHS priority, and over time there may be more opportunities for older people with frailty to access and use technology (11). Research now needs to assess if these changes positively affect older people with frailty, support engagement with CGA that utilises technology, and whether they diminish inequalities in access to technology informed care.

Qualitative interviews enabled exploration and synthesis of older people and HCPs perspectives. Although we recruited older people with frailty and HCPs with a wide variety of views and experiences, our findings may not be transferable to older people and HCPs who have different experiences or perspectives (e.g. we were unable to recruit any social workers despite employing several strategies) (17, 19). However, our theoretically informed qualitative research and stakeholder insights identified both challenges to the current delivery of CGA as well as opportunities for the improvement of CGA for older people with frailty.

Conclusions

We identified four factors to enable implementation of CGA in community: enhancing staff competency in working with older people with frailty, creating interoperable IT-systems, assigning a care coordinator for older people with frailty, and mitigation of the impact of inequalities in access to digital care. Introducing technology and a designated comprehensive care coordinator may be vital to addressing gaps in the current provision of CGA. These solutions may also positively affect the acceptability of CGA in older people with frailty. The next stage of this research will further develop, refine and test a model of improved CGA in community setting.

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Authors' Contributions

VG and JW conceived the ideas for the research with the help of JF and SL. AM collected the data. AM, JF and VG analysed the data. AM led the writing with the help of JF and VG. NM, HL, SL and SC critically revised the manuscript. All authors have approved the final version of the article.

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Conflict of interests

None.

Ethics approval and consent to participate

All the participants gave written informed consent and consent to participate. Ethical approval was issued by the University of Exeter, College of Medicine and Health Research Ethics Committee (Ref 509407).

Consent for publication

The participants gave their consent to participate in the study and to publish anonymised quotes from the interview transcripts. The names of the participants have been anonymised.

Availability of data and materials

Supplementary data mentioned in the text are available in the additional files.

Additional files

Additional file 1 contains topic guide for interviews with older people.

Additional file 2 contains topic guide for interviews with HCPs.

Topic guide –Older people and carers

Researcher to introduce self, ask why participant interesting in taking part and orientate then as to what they will be discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.

Topic	**Prompts**
Background	
Could you tell me a bit about yourself and what is important to you in your life /lives?	Who they are? Where they live? What do they do? Support networks
Does your health or personal situation impact on what is important to you?	How? why?)
Appointments with health and care staff	
Please can you think back to a recent appointment with a health or social care professional (such as a Dr or nurse), and tell me about what happened in that appointment	Thinking about things like asking questions, checking your ability to do something, or taking any measurements? Did you get the chance to say anything such as what is important to you
What did you think about how that appointment was conducted?	Whether they would have liked anything to have been done differently, or not done at all? what you would have liked to have happened? And why?
If an appointment went well, what were the things that were done, that made that a positive experience for you?	Anything that could have been done differently?
Are you able to give me any examples of how the pandemic has changed how you engage with health and care staff?	What has worked well for you? What hasn't worked so well?
Thinking ahead	
We are exploring different ways health and care professionals might conduct appointments with older people or find out about a person's health. I am going to ask you your thoughts about different ways they could do this: • What do you think about appointments being done remotely; for example by telephone or video? • What do you think about using different ways of sharing information on their current health with staff; for example filling out questionnaires? • What do you think about using equipment that collects information about your health, for example taking your own blood pressure and sending results to your GP? • What do you think about using a mobile phone to share information about how you are doing; for example, a weekly phone check-in with health or care staff? • What do you think about using wearable technology, for example a pedometer or fitbit that collects data about your movement or exercise?	What informs their thinking, any preferences, concerns or worries? Can you think of any other older people for whom these might not be appropriate, could they make things worse, What sort of problems may pose particular challenges? Could these be helpful or beneficial to older people? What might be needed to use effectively?
For those who might struggle with technologies, can you think of ways in which staff can best support them to ensure they can still access to the best possible care?	Who might struggle?
If we want to set up a new way of doing appointments using technology, what should we measure to see if the new way works?	

Is there something else that I have not asked you about, that you would like to tell me about your health and healthcare?

Thank you.

Topic guide –Staff

Researcher to introduce self, ask why participant interesting in taking part and orientate then as to what they will be discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.

Topic	Prompts
Background	
Please can you tell me a bit about your professional background and current role?	How long and it what capacity have you been working with older people? Describe the setting you work in.
Please can you tell me a bit about the older people that you work with and the kinds of things that you do with them in consultations	Asking them questions, checking their ability to do something, or taking any measurements?; do you do things differently if they are acutely unwell vs proactive/preventative care; how do you tailor assessments and care to meet individual needs/what is important to them
Current assessments	
What do you think older people/carers think about what you assess and how you conduct assessments	Do you think that they might like anything to be done differently, or not done at all?
If a consultation goes particularly well, what is it that you have done, that might have made that a positive experience for them?	Is there anything that you might do differently? If yes: can you please describe in what circumstances you might do this? And why?
Are you able to give me any examples of how the pandemic has changed how you engage with older people specifically?	What has worked well for you? and what hasn't worked so well
Thinking ahead	
Can you think of any ways in which you might be able to undertake more effective assessments with older people?	What are they hoping to achieve? What is stopping them?
One way that assessments might be undertaken different, is by them being undertaken remotely or by using different types of technology, and I am going to ask you your thoughts on some examples: • What do you think conducting assessments with older people remotely; for example by telephone or video? • What do you think about using different ways that older people might share their information with you; for example filling out questionnaires? • What do you think about using equipment that collects older people's information, for example taking their own blood pressure and sending to you, you will have access to the results? • What do you think about older people using a mobile phone to share information about how they are doing with you; for example, a weekly phone check-in with healthcare staff? • What do you think about older people using wearable technology, for example a pedometer or fitbit that collects data about their movement or exercise?	Prompt as to what informs their thinking, any preferences, and concerns or challenges eg any people/groups that not appropriate for/make things worse? How do you avoid inequalities in access to care When might these be helpful or beneficial to older people? What might they need to engage effectively
If we were to evaluate a new intervention for older people or, what do you think that we should measure to see if it works?	How could we measure the impact of a new intervention?

Is there something else that I have not asked you about, that you would like to tell me about?

Thank you

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Section/Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	Methods/Design
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	PhD
Occupation	3	What was their occupation at the time of the study?	Methods/Design
Gender	4	Was the researcher male or female?	Methods/Design
Experience and training	5	What experience or training did the researcher have?	Methods/Design
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	Methods/Sampling and recruitment
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Appendix1 and 2
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Declaration
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Methods/ Data collection and Data analysis
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Methods/Sampling and recruitment
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	Methods/Sampling and recruitment
Sample size	12	How many participants were in the study?	Results/older people and Healthcare professionals
Non-participation	13	How many people refused to participate or dropped out? Reasons?	Results/older people and Healthcare professionals
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	Methods/Sampling and recruitment
Presence of nonparticipants	15	Was anyone else present besides the participants and researchers?	Results/older people

Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	Results/older people and Healthcare professionals
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Methods/ Data collection
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	NA
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	Methods/ Data collection
Field notes	20	Were field notes made during and/or after the inter view or focus group?	Methods/ Data collection
Duration	21	What was the duration of the inter views or focus group?	Results/older people and Healthcare professionals
Data saturation	22	Was data saturation discussed?	NA
Transcripts returned	23	Were transcripts returned to participants for comment and/or	NA
Topic	**Item No.**	**Guide Questions/Description**	**Reported on Page No.**
		correction?	NA
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	Methods/ Data analysis
Description of the coding tree	25	Did authors provide a description of the coding tree?	Methods/ Data analysis
Derivation of themes	26	Were themes identified in advance or derived from the data?	Methods/ Data analysis
Software	27	What software, if applicable, was used to manage the data?	Methods/ Data analysis
Participant checking	28	Did participants provide feedback on the findings?	NA
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Results
Data and findings consistent	30	Was there consistency between the data presented and the findings?	Results and Discussion
Clarity of major themes	31	Were major themes clearly presented in the findings?	Results
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Results

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

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How can we improve Comprehensive Geriatric Assessment for older people living with frailty in primary care and community settings? A Qualitative Study

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How can we improve Comprehensive Geriatric Assessment for older people living with frailty in primary care and community settings? A Qualitative Study

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Abstract

Objective

With advancing age comes the increasing prevalence of frailty and increased risk of adverse outcomes (e.g. hospitalisation). Evidence for Comprehensive Geriatric Assessment (CGA), a multi-dimensional holistic model of care, is mixed in community settings. Uncertainties remain, such as the key components of CGA, who delivers it, and the use of technology. This study aimed to understand perspectives, beliefs and experiences, of both older people and health professionals, to improve the current CGA, and explore factors that may impact on CGA delivery in community settings.

Design

A qualitative interview study was conducted with older people and health care professionals identified using a maximum variation strategy. Data were analysed using an abductive analysis approach. The Non-adoption, Abandonment, Scale-up, Spread and Sustainability (NASSS) framework

and the Theoretical Framework of Acceptability guided the categorisation of the codes, and identified categories were mapped to the two frameworks.

Setting

England, United Kingdom

Results

Twenty-seven people were interviewed, constituting 14 older people and 13 healthcare professionals (HCPs). We identified limitations in the current CGA: a lack of information sharing between different healthcare professionals who deliver CGA; poor communication between older people and their HCPs; and a lack of follow-up as part of CGA. When we discussed the potential for CGA to utilise technology, HCPs and older people varied in their readiness to engage with it.

Conclusions

Viable solutions to address gaps in the current delivery of CGA include the provision of training and support to use digital technology and a designated comprehensive care coordinator. The next stage of this research will use these findings, existing evidence and stakeholder engagement, to develop and refine a model of community based CGA that can be assessed for feasibility and acceptability.

Keywords

Ageing, comprehensive geriatric assessment, digital technology, frailty, qualitative.

Strengths and Limitations

- Use of qualitative interviews enabled rich data on exploration and synthesis of older people and healthcare professionals.
- Our theoretically informed qualitative research and stakeholder insights identified both challenges to the current delivery of CGA as well as opportunities for the improvement of CGA for older people with frailty.

- Our study is deliberately exploratory; thus the findings may not be transferable to other older people and healthcare professionals. However, we recruited older people with frailty and HCPs with a wide variety of views and experiences.

Introduction

Between 2020 and 2050 the number of people worldwide aged over 80 will triple to reach 26 million (1). With ageing, people are more susceptible to develop multiple, long-term conditions that reduce their independence and quality of life (1-4). This is due to underlying factors, such as falls, frailty, and delirium (1, 3).

Frailty is a clinical syndrome where multiple body systems deteriorate leading to increased vulnerability (3, 5). Frailty increases the risk of falls, disability, hospitalisation, mortality, and contact with healthcare services (5, 6). Prevention and reversal of frailty can enable people to stay well and live independently for longer (3). Frailty affects half of the UK population aged over 85 and costs the publicly funded National Health Service (NHS) £5.8 billion per year (6). A key priority of the NHS in the UK is to support older people with frailty to manage their long-term conditions (3, 7).

Older people living with frailty need robust interventions tailored to the complexity of their care needs (3, 8). Comprehensive Geriatric Assessment (CGA) is a multi-dimensional diagnostic and therapeutic intervention that includes an assessment of physical, cognitive and psychosocial components with the development of a holistic management plan in partnership with the older person with frailty (8). CGA delivered in acute, primary and community settings aims to prevent deterioration and complications associated with frailty (3, 9). However, the effectiveness of CGA for older people with frailty in primary care and community settings is mixed (8, 10, 11). Ho et al reported benefits in terms of the likelihood of living at home, reduced mortality, improved cognition, and activities of daily living, but with uncertain benefits on quality of life (11), whereas Briggs and colleagues found no difference in mortality, activities of daily living, quality of life and care home

admissions (8). Descriptions of CGA components often lack detail, including the delineation of staff involved in delivery, and an understanding about factors that affect implementation are limited (12).

Recent NHS initiatives to strengthen the efficiency of outpatient services using alternative approaches require consideration. For example, there is growing interest in the use of wearable devices to monitor patients (7). The NHS Long Term Plan, and Digital Transformation Plan, recommend the use of digital equipment in the assessment and monitoring of older people with frailty; with the option of using wearable devices to ensure services are inclusive and available to all (7, 12). However, digital technologies are not part of the existing evidence for CGA.

Regardless of the complexity and diversity of the needs of older people with frailty, some face inequities in access to interventions which may help to maintain or improve their independence (3). For example, whilst telemedicine can beneficial, cost-effective and acceptable to older people (13), there are concerns about digital exclusion (14) and risks that important signs and symptoms could be missed (15). Improving the effectiveness and efficiency of CGA (11) requires exploration of how individual components may work and how the overall intervention can be enhanced. The Digital and Remote Enhancement for the Assessment and Management of Older People with Frailty (DREAM) project aimed to develop a community-based model of CGA that incorporated technology. This qualitative study aimed to understand perspectives, beliefs and experiences of both actual and potential providers and users to improve the current CGA and explore the factors that may impact on CGA delivery in community settings, including the use of technology.

Methods

Design

A qualitative interview study with older people and health care professionals was conducted. AM, a female post-doctoral research fellow and pharmacist, collected and analysed the data in collaboration with VG (a female academic physiotherapist) and JF (a female medical sociologist). All

had experience of conducting qualitative research. Ethical approval was issued by the University of Exeter, College of Medicine and Health Research Ethics Committee (Ref 509407). The study has been reported according to the Consolidated Criteria for Reporting Qualitative Study (COREQ) guidelines (16).

Patient and Public Engagement

Patient Public Involvement and Engagement (PPIE) and Health and Care Professional (HCP) advisory groups contributed to the development, design and conduct of this research through a series of workshops. They contributed to developing and piloting topic guides for the interviews and provided analytical insight into preliminary findings through discussions.

Sampling and Recruitment

Older people

Participants were recruited from the Community Ageing Research (CARE) 75+ (17) or the Oxford Pain Activity and Lifestyle (OPAL) (18) cohorts. Both CARE75+ and OPAL are representative, prospective longitudinal studies designed as both epidemiological studies of older people living in the community in the UK and as recruitment platforms to help overcome some of the challenges of older people being under-represented in research (19). We applied a maximum variation sampling strategy to identify Care75+ and OPAL participants who had consented to be contacted, to capture diversity in gender, ethnicity, living circumstances, socioeconomic factors, geography, frailty, sensory (e.g. visual or hearing problems), and memory problems. Batches of invitations to participate were sent out to 15-20 people at a time by AM (for Care75+ participants) and the OPAL research team (for OPAL participants). In total, 132 invitations were sent out. We continued recruiting from May 2022 to December 202 until our concurrent analysis yielded an in-depth understanding of where and how CGA might be improved.

Healthcare Professionals

For healthcare professionals, we also used a maximum variation sampling strategy (21), to ensure representation of professional background, geographical location, and gender. We invited health and social care professionals working in non-hospital settings in the UK working with older people living with frailty via social media (Twitter and Facebook) and via professional networks.

All older people and healthcare professionals who expressed an interest in taking part were recruited.

Data collection

We developed semi-structured topic guides (21, 22) for older people (Additional file 1) and HCPs (Additional file 2) based on a review of literature and online workshop discussions with our two advisory groups made up of older people, family members, and HCPs. We did not use the term CGA in the interviews with older people as advised by the two advisory groups. Topic domains were aligned to the Non-adoption, Abandonment, Scale up, Spread and Sustainability (NASSS) framework to ensure collection of rich data and to explicitly focus our analysis on how best to improve CGA (23). The NASSS framework has previously been used to explain the interacting factors that affect the implementation of complex interventions that utilise technology and generate mixed outcomes (23, 24). AM piloted the topic guide with members of the PPIE advisory group and refined one question (concerning outcomes to be measured) for clarity. The topic guide enabled consistency in the data collection, with the interviews flexible enough to allow the participants to explain what was important to them (25). The interviews were conducted face-to-face, via telephone or video call, depending on the participants' preference (21). AM introduced herself and explained the aim of the study to the interviewee at the beginning of each interview. The audio-recorded interviews were transcribed by a GDPR compliant transcriber and checked for accuracy by AM. Fieldnotes captured the context of the interview. AM had no previous contact with any of the participants.

Data analysis

We undertook abductive analysis (26), and used NVivo 13 (Release 1.7) (27) to manage the data. This involved an iterative approach to analysis, to facilitate understanding (25, 28). We coded the interviews in cycles, with deductive codes from the literature and inductive codes generated by AM, identifying similar ideas or concepts that could be categorised into a code (25, 29). This enabled balance between data relating to pre-existing concepts and data based on the perspectives of the participants (26, 30). We (AM, VG and JF) then developed a conceptual map of the different participants' perspectives (22). The NASSS framework, and the Theoretical Framework of Acceptability (23, 31) guided the categorisation of the codes. The categories were then mapped to the two frameworks, which enabled further elaboration of the complexity within the domains of an intended CGA intervention that utilises technology. For example, the broad analytical category 'Organisation' was constituted by various coding categories, including person-centred and accessible records, digital enabling for staff, information sharing between HCPs and continuity of care. We used a conceptual map to create a hypothetical case (vignette) of an older person who participated in a CGA that used technology (32). We used the vignette in the final three interviews with HCPs, to extend our understanding of the potential afforded by technology. Preliminary findings were presented to the advisory groups for discussion and consideration of their interpretations.

Results

Older people

Fourteen older people consented to participate and were interviewed. Respondents were aged between 75 and 90 years old, were evenly split between males and females, and included participants with hearing and/or visual impairment, mobility impairments, and with one or more long term condition. One participant asked to be interviewed in the presence of their carer (a spouse). The interviews lasted between 16 and 92 minutes. (Table 1).

Table 1 Demographic characteristics of older people with frailty

Participant Pseudonym	Gender	Age	Current residence in England	Living circumstances	Mode of interview
Robert	Male	84	North East	Live alone	Telephone interview
James	Male	83	South West	Live alone	In-person interview
Richard	Male	82	South West	Live with spouse	Online audio call
William	Male	90	North East	Live with spouse	Online video call
Barbara	Female	82	North East	Live with spouse	Telephone interview
Gary	Male	76	North East	Live with spouse	Telephone interview
Karen	Female	79	South East	Live alone	Online video call
Steven	Male	75	South East	Live with spouse	Telephone interview
Shirley	Female	79	Midlands	Live alone	Telephone interview
Frances	Female	89	South East	Live alone	Telephone interview
Carol	Female	82	North West	Live alone	Telephone interview
Donna	Female	85	South East	Live alone	Telephone interview
Frank	Male	80	Midlands	Live with spouse	Telephone interview
Lois	Female	86	South West	Live with spouse	Telephone interview

Healthcare professionals

The thirteen HCPs came from different professional backgrounds, and from different geographical areas of England. All of the participants were working, or had worked, with older people with frailty, for a duration of two to 30 years (Table 2). The interview duration ranged between 33 and 160 minutes.

Table 2 Demographic characteristics for HCPs who participated in the study

Participant number	Profession	Years of providing care to older people	Location in England	Gender	Mode of interview
HP1	Frailty assistant practitioner	20	South West	Female	Online
HP2	Nurse	15	South West	Male	Online
HP3	GP	Retired	North East	Female	Online
HP4	Physiotherapist	19	South West	Female	Online

HP5	GP	16	South West	Female	Online
HP6	Physiotherapist	30	South West	Female	Online
HP7	Nurse	15	South West	Female	Online
HP8	Nurse	2	South East	Female	Online
HP9	Occupational therapist	10	South East	Female	Online
HP10	Consultant Geriatrician	23	North West	Male	Online
HP11	Consultant Geriatrician	19	Midlands	Female	Online
HP12	Physiotherapist	4	Midlands	Female	Online
HP13	Pharmacist	3	North West	Female	Online

We identified patterns about the conditions to enhance CGA across the two data sets, then classified these patterns into the eight domains of the NASSS framework and to the Framework of Acceptability (23, 31). Here we present the four domains that were most important for both the patient and professional participants: frailty (the condition), intended adopters (both professional and lay), organisational factors (such as workforce challenges), and acceptability (of technology and assessment).

Frailty

Amongst HCPs, there was an appreciation of the complexity of frailty. Regardless of whether they have a need for acute care or not, all older people with frailty have complex needs due to having multiple long-term conditions, impairments and/or socioeconomic factors:

> *"Most of them are aged 80 almost all of them are frail and so they have multiple chronic conditions, they have got polypharmacy they tend to need some help with one or more activities of daily living". (HP13, Pharmacist)*

HCPs from different professions tend to provide a comprehensive assessment that involves physical, psychological and social needs for older people with acute and non-acute care needs. However, there is a need to provide older frail people with assessment prior to a crisis developing:

> *"All the domains yeah, the psychological, physical all those you know functional, environmental you know do you live in a house, a flat, bungalow, do you sleep upstairs, any falls you know any equipment in the toilet, that kind of thing and social you know do you get out." (HP12, Physiotherapist)*

> *"So, if you're trying to keep somebody weller for longer, then any of those proactive interventions rather than waiting until they get to crisis point." (HP9, Occupational therapist)*

We interviewed older people with frailty who were socioeconomically disadvantaged and/or experienced sensory or physical impairment that can exacerbate the complexity of their care needs. For example, Carol had financial challenges, restricted mobility, visual impairment, multiple long-term conditions, and a high risk of falling. Carol had limited choices in access to care, because of her restricted ability to travel to appointments, lack of a support network, and no access to technology:

> *"I've been a single person all my life and I get the basic state pension. So, I've never ever been able to afford the technology that people use every day to day in these days and that's the reason I don't have it." (Carol, 82 years old)*

On the other hand, Karen lived alone, but has regular communication with family and friends. During her health and care journey, Karen was able to enact her own health decisions and avoided long NHS waiting time for tests and referrals:

> *"I only saw the consultant yesterday, so the next steps haven't been put in place yet. Unfortunately, I have had to pay privately for it and the NHS seems to be in such a mess and the doctor did want to send me off for tests but she couldn't justify so, more or less saying well you know it is as it is we can't do anything more for you because we haven't got proof that this test or that test is something we can do, something we can justify. […] I'll have to pay for that privately otherwise I will just be waiting too long. You know I am getting on I don't want the last two or three years probably of my life to be sitting around at home feeling sorry for myself." (Karen, 79 years old)*

Intended adopters

Some HCPs indicated that an HCPs occupational background may inform the scope of assessment during the CGA, and the quality of the CGA that they offer. A nurse who led a frailty team showed

appreciation of the range of HCP backgrounds in their team, which enabled them to involve the most suitable HCP (e.g. in terms of their skill set), to meet the unique needs of the older person:

> *"obviously if it was things like their ability to perform their physical activity to daily living that maybe something that I would involve one of, I've got a colleague who is Band 4 assistant practitioner whose got a therapy background she's very good at looking at the nuts and bolts of how people physically manage […] I will also do joint visits with OTs and physios if we're feeling that we need to, that there's a, that the referral makes it sound like this is very much that mixed picture of it's not just a medical requirement or a strict nursing requirement that there's an overlap with where my therapy colleagues would come in". (HP2, Nurse)*

This contrasted consultant geriatrician (HP11) who also led a frailty team. HP11 indicated that regardless of the different backgrounds of HCPs in their team, there should be no differences in the CGA that they provide to older people with frailty. However, HP11 highlighted that some professions may have limited ability to understand the complexity of older people's care needs. This was congruent with the views from older people who thought that their care needs could be managed better by an HCP with knowledge and experience of older people with frailty:

> *"They all do the same because they've all had their advanced […], course the advanced assessment healthcare assessment course. They've all done the same course ok,". (HP11, Consultant Geriatrician)*

> *"You could have one doctor who is in the practice who specialised in old people you know just for the aged to sort of he specialised in the aged. […] where old people could feel they could go […] rather than a general practitioner maybe somebody that was for the old and the frail." (Barbara, 82 years old)*

A GP (HP3) thought that the ability to deliver CGA depends upon the investigative and communication skills, and previous experience of staff, and it is not restricted to a particular background:

> *"So, I tend to work on a concept that I don't like thinking about professions doing things I like to think about competencies." (HP3, GP)*

Some HCPs suggested that HCPs may require training to improve interpersonal skills, in terms of communication and attention to detail, to ensure enhancement of CGA. For example, HP12 (a Physiotherapist) shared their personal experience of developing their investigational skills when providing remote CGA over time. HP7 (a Nurse) shared their experience of supporting new HCPs in their team to learn how to pick-up non-verbal cues during home visits, to support identifying care needs and provide CGA.

Organisation

Interviewing HCPs from different geographical areas of England allowed us to explore organisational limitations, which would require innovation to increase readiness for new forms of technology-informed care delivery.

Some HCPs made references to fear and resistance to trying new ways of care delivery. For example, a nurse (HP2) referred to themselves as 'a dinosaur' when it comes to trying new technologies. Similarly, a frailty assistant practitioner (HP1) also indicated that practitioners may need support from colleagues, while a consultant geriatrician (HP11) shared the challenges they had when using technology and the time needed for training to use new technology:

> *"There's also the training aspect of it. Training takes a long time you go in and sit down and have training whatever new technology comes you have to find time to go for training and you actually don't get to understand its use until you start using it and the problems that you get when you start using it". (HP11, Consultant Geriatrician)*

Almost all HCPs discussed the negative impact of using different clinical databases in various settings on their ability to share and/or access patients' records. HCPs discussed the importance of having a well-established information sharing process between HCPs in different settings in enhancement of CGA. HCPs shared their experiences of meeting the challenges in information sharing. For example, sharing data in regular Multi-Disciplinary Team (MDT) meetings, provides access to the GP medical records for HCPs who work in the community, which enables them to effectively support the older

people with whom they work. Some organisations have a sharing document that all HCPs involved in CGA can use to input and share data, which staff found beneficial in terms of the availability of information and efficiency in obtaining key information when needed:

"I've not seen they've had a CGA, their clinical frailty scale is this, blah, blah, blah never seen it never ever. Never ever, ever seen it. So, information is not coming it is not flowing". (HP12, Physiotherapist)

" I just from previous experience I knew these sorts of things I needed to have so I made sure that I discussed it with the CCG and got them to put this in place because I didn't want to be spending exactly like the nurse, two hours, trying to get information when in five minutes I can have that information." (HP10, Consultant Geriatrician)

"So, for me to be able to know what medicines somebody is on, I have to have access to that or I've got ask somebody who has access to check for me ok". (HP11, Consultant Geriatrician)

Lack of staff capacity was perceived as a limitation for delivering CGA by all HCPs, which may inhibit delivery of timely support which an older people may require. Some older people recognised the limited staff availability and the increasing demands on the GP practices that inhibit continuity in care. For them, lack of continuity decreases their engagement with their care:

"More of us, more availability [..] I mean we are running its sort of like a virtual ward model but it's going to be, we have less staff on at a weekend. So, our capacity to take new referrals on a Friday and over the weekend is a lot less." (HP9, Occupational therapist)

""When you see the doctor, you know you barely it's a locum that I see I don't see my own doctor."." (Shirley, 79 years old)

Other older people with frailty understood the current workforce challenges in the NHS and suggested that improved communication between HCPs and sharing information may mitigate the current lack of continuity:

> *"GPs talk to each other and that you know if you go in and you see somebody who is not your designated GP you know that fine well that the notes are there […]. So, you feel perfectly happy that you know whoever you are seeing, knows what they are talking about." (Lois, 86 years old)*

However, we identified that when an older person can identify a key contact person to support them, this can mitigate a lack of continuity in their care, because they key person can co-ordinate their care and ensure the continuous flow of communication:

> *"So, I sort of stayed involved in this case as a coordinating factor because you know it happens when too many people are involved things the outcome might not be good or the people can get lost in translation and so I managed to speak to the mental health team and everything and draw all the people that the GP had referred to, to a point where I said now, you need to take this forward." (HP12, Physiotherapist)*

Acceptability

We identified elements that might influence acceptability by older people with frailty, that should be taken into consideration when enhancing CGA.

Although HCPs perceived that older people were satisfied with CGA and the care provided to them, some older people indicated that they could not freely communicate with HCPs and express their needs, because of perceived short appointments with their GP. Furthermore, older people lacked trust in their HCPs, or the clinical decisions made about their treatment plan:

> *"I would say the consistent feedback is normally that they're greatly relieved that we've given the time 'cos we don't time specify our visits" (HP2, Nurse)*

> *"No, it's so quick and it's so, I mean in person, well I wouldn't say personal you know when you speak to a doctor like I did with my old doctor if he, it was just a different attitude towards you, it's like a conveyor belt, you come in, you go out, you come in and you go out so, you know you just feel it's not the same what it was before." (Shirley, 79 years old)*

Moreover, HCPs acknowledged the variation in older people readiness to engage with new ways of care delivery:

> *"There is a high risk of inequalities because anytime you are going introduce something different new, there are going to be people who can use it very easily and there are going to be those who can't for whatever reasons". (HP13, Pharmacist)*

This aligned with the findings from interviews with the older people themselves. For example, Karen showed readiness to engage with new ways of receiving technology-informed care because she had previous experience of using technology in her healthcare, and in communication with family members. In contrast, Shirley rejected engagement with new forms of remote appointments:

> *"They did ask me once yes, but I said, well, I don't know how to do it, let's put it that way a video appointment I mean I don't […] I have a mobile phone so, you know I just don't know how to do it. So, the other solution was that they speak to me over the phone". (Shirley, 79 years old)*

Lack of physical access to technology (e.g. a device or internet connection) can inhibit an older person's opportunity to learn how to use technology, which may subsequently limit their readiness to engage with new forms of technology informed care. Therefore, those with frailty may require additional support to engage with CGA that utilises technology. For example, older people with sensory impairment may require specialist adaptation to their device, or support from a carer to engage; whereas older people who are already digitally literate may only need educational input on how to use a new technology.

HCPs recognised the variation in the needs and preferences of older people with frailty and discussed how they tailor CGA to the person's needs:

> *"I would say we're able to be very person-centred we're not looking at things from a clinician's perspective only we will explore things from the patient's perspective in terms of what they think is their problems." (HP4, Physiotherapist)*

Some HCPs thought that the presence of a carer, a family member or support network may increase a frail older person's acceptance of CGA that utilises technology. However, HCPs acknowledged the

higher demands on the carer which may reduce the support they can provide, to help the older adult engage with technology. A GP (HP3) shared examples of caregivers who inadvertently disempower the older person, in terms of decision-making about their healthcare choices. Older people may therefore require support from a wider network, and not only their carer:

> *"Some of them have families who help them but they still like you know eye contact, physical contact and the written word, you know paper, hard copy of anything. So, I am afraid that's something that they'll eventually all pop off but and thankfully the younger ones are you know quite capable of using all these devices." (Barbara, 82 years old)*

HCPs may not be able to provide the required follow-up after an assessment, important for tracking the referrals to other services if needed and the management plan provided to the patient. Similarly, older people explained the challenges that they were facing in following-up the HCPs; for example, to find out the result of a test, or to book an appointment:

> *"I would like to think we're good at going out and identifying the problem we're good at negotiating a management plan with someone it's then how do you monitor the effect of that management plan". (HP2, Nurse)*

> *"I had to phone my practice after I'd been to see the 111 doctor and she said get in touch with your practice and I got this sort of non-committal reply oh, well you'd better start your antibiotics and I was quite disappointed that they didn't get in touch with me because they'd given me that advice without having seen a report and I thought well I would have expected something to come back but like I said, I was really not well enough to do anything about it". (Donna, 85 years old)*

Discussion

This study explored the factors that may impact on CGA delivery in community settings, including the use of technology. This research adds to the current growing evidence on challenges on delivering effective CGA in community settings and identified factors to enhance CGA in community settings from the perspectives of older people and HCPs.

In this study, we identified key challenges to the enhancement of CGA in the community, including: information sharing between different HCPs who are delivering the CGA; communication between older people and their HCPs; and follow-up appointments after conducting the CGA. From the current challenges that were explained by participants, and suggestions which they made to address them, workshop discussions with advisory group members and existing literature, we identified factors to enhance CGA in the community.

Both HCPs and older people considered that the delivery of CGA should not be limited to those from specific professions but should be based upon HCPs competency and knowledge of the complexity of need for older people with frailty. This finding aligns with the Ageing Well Network of Enhanced Care for older People (EnCOP) competency framework (33); an aim of which is to enhance staff competency in working anywhere in the care system (33). The Health Education England and NHS England commissioned the Frailty Core Capabilities Framework in 2018 to identify skills and behaviours required to deliver high quality of care to older people with frailty (34). However, there is limited use of the framework in commissioning education or training, reflected in the results of evaluation surveys that were conducted in 2018 and 2019 (35). We suggest that upskilling staff and providing them with appropriate training to improve their communication and investigation skills may be a viable solution to mitigate the negative impact of workforce shortages on the effectiveness of CGA.

From conducting interviews augmented by workshop discussions with advisory group members, we identified the need for assigning a member of staff or MDT team to a co-ordinating role, which we designated as “Comprehensive Care Coordinator”. This person could coordinate the delivery of CGA by facilitating information sharing between different HCPs, communicating with older people with frailty on a regular basis, and ensuring that the management plan including referrals is acted upon. Designating a care coordinator may improve continuity of care with one point of contact and provide reassurance through a therapeutic, long-term relationship. This may provide reassurance to the

older person and ensure effective follow-up of any management plan. Care coordinator roles in the community, including case managers, may reduce emergencies. However, evidence shows variation in the role in different studies in terms of duration and frequency of home visits and HCPs who coordinated the care (11, 36, 37). Further research needs to identify who could best coordinate care in older people and what the best approach may be.

Moreover, HCPs agreed that utilising technology in the delivery of CGA may enable HCPs to provide support for older people without compromising their follow-up. The NHS plan highlighted the need for enhancing the use of technology in healthcare, to change how care is being provided to patients; and to create joined up computer systems that give staff sufficient access to data, to provide improved care for patients (7). However, there is a need for digital upskilling of staff to support their effective use of technology in healthcare (38).

Different IT-systems and a lack of information governance arrangements across different settings currently inhibits information sharing and creates tension between HCPs in different settings. HCPs told us that the lack of connection between different systems must be addressed, if they are to deliver an effective CGA. Similarly, older people mentioned how lack of access to information magnified unequal access to effective CGA, and support and care for older people with frailty. In February 2023, NHS Digital became responsible for digital technology, data and health and care delivery. This has the potential to address some of the challenges in information sharing (39). Existing research has identified the need for convenient platforms and improved digital records for integrated care services for older people (including CGA) that maintain privacy and security when sharing patient data between MDTs (38, 40). Such integrated platforms may enhance communication and coordination of care (38, 40). However, resolving existing operational complexities is likely to require additional funding and the creation of interoperable IT-systems (7, 38, 39, 41).

We found that socioeconomic factors, including living circumstances, income, and social network impacted older peoples' treatment choices; in terms of whether they visited a clinical specialist and waiting times for NHS appointments. This implies that when developing the CGA that utilises technology we need to consider how to mitigate socioeconomic factors that inhibit access and capacity to obtain the benefits of using digital equipment in the assessment and follow-up. Existing research suggests that digital interventions are less effective in populations with socioeconomic disadvantage compared with those with higher socioeconomic status (42). Although the COVID 19 pandemic accelerated the shift to online resources and services, and changed patient perceptions and willingness to use technology, it increased digital inequalities (43, 44). Amongst those aged 75 and over in the UK, 42% do not use the internet, reporting a lack of digital skills as the main reason (45). However, the older population is changing, and the next generation of older people are more familiar with using technology, with 77% of those aged over 55 using a smart phone (46), and 55% of those aged 50-64 using the internet most days (45). However, increasing physical access to connected devices and the internet alone may not be enough to reduce inequalities in access to CGA that utilises technology (42, 43, 47). Therefore, training and support would be needed to ensure older people could be digitally enabled; however, this may not be appropriate for everyone, and support would need to be individualised (45).

Using technology for monitoring and supporting older people with frailty is an NHS priority, and over time there may be more opportunities for older people with frailty to access and use technology (7). Research now needs to assess if these changes positively affect older people with frailty, support engagement with CGA that utilises technology, and whether they diminish inequalities in access to technology informed care.

Qualitative interviews enabled exploration and synthesis of older people and HCPs perspectives. Although we recruited a range of older people and HCPs with a wide variety of views and experiences, our findings may not be transferable to all older people and HCPs who have different

experiences or perspectives (e.g. we were unable to recruit any social workers despite employing several strategies) (22, 25). However, our theoretically informed qualitative research and stakeholder insights identified both challenges to the current delivery of CGA as well as opportunities for the improvement of CGA for older people with frailty.

Conclusions

We identified four factors to enable implementation of CGA in community: enhancing staff competency in working with older people with frailty, creating interoperable IT-systems, assigning a care coordinator for older people with frailty, and mitigation of the impact of inequalities in access to digital care. Introducing technology and a designated comprehensive care coordinator may be vital to addressing gaps in the current provision of CGA. These solutions may also positively affect the acceptability of CGA in older people with frailty. The next stage of this research will further develop, refine and test a model of improved CGA in community setting.

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Authors' Contributions

VG and JW conceived the ideas for the research with the help of JF and SL. AM collected the data. AM, JF and VG analysed the data. AM led the writing with the help of JF and VG. NM, HL, SL and SC critically revised the manuscript. All authors and collaborators have approved the final version of the article.

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Conflict of interests

None.

Ethics approval and consent to participate

All the participants gave written informed consent and consent to participate. Ethical approval was issued by the University of Exeter, College of Medicine and Health Research Ethics Committee (Ref 509407).

Consent for publication

The participants gave their consent to participate in the study and to publish anonymised quotes from the interview transcripts. The names of the participants have been anonymised.

Availability of data and materials

Supplementary data mentioned in the text are available in the additional files.

Additional files

Additional file 1 contains topic guide for interviews with older people.

Additional file 2 contains topic guide for interviews with HCPs.

Topic guide –Older people and carers

Researcher to introduce self, ask why participant interesting in taking part and orientate then as to what they will be discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.

Topic	**Prompts**
Background (NASS Domain Frailty)	
Could you tell me a bit about yourself and what is important to you in your life /lives?	Who they are? Where they live? What do they do? Support networks
Does your health or personal situation impact on what is important to you?	How? why?)
Appointments with health and care staff (NASS Domains CGA, Organisation, Intended adopters and Embedding)	
Please can you think back to a recent appointment with a health or social care professional (such as a Dr or nurse), and tell me about what happened in that appointment	Thinking about things like asking questions, checking your ability to do something, or taking any measurements? Did you get the chance to say anything such as what is important to you
What did you think about how that appointment was conducted?	Whether they would have liked anything to have been done differently, or not done at all? what you would have liked to have happened? And why?
If an appointment went well, what were the things that were done, that made that a positive experience for you?	Anything that could have been done differently?
Are you able to give me any examples of how the pandemic has changed how you engage with health and care staff?	What has worked well for you? What hasn't worked so well?
Thinking ahead (NASS Domain Technology)	
We are exploring different ways health and care professionals might conduct appointments with older people or find out about a person's health. I am going to ask you your thoughts about different ways they could do this: • What do you think about appointments being done remotely; for example by telephone or video? • What do you think about using different ways of sharing information on their current health with staff; for example filling out questionnaires? • What do you think about using equipment that collects information about your health, for example taking your own blood pressure and sending results to your GP? • What do you think about using a mobile phone to share information about how you are doing; for example, a weekly phone check-in with health or care staff? • What do you think about using wearable technology, for example a pedometer or fitbit that collects data about your movement or exercise?	What informs their thinking, any preferences, concerns or worries? Can you think of any other older people for whom these might not be appropriate, could they make things worse, What sort of problems may pose particular challenges? Could these be helpful or beneficial to older people? What might be needed to use effectively?
For those who might struggle with technologies, can you think of ways in which staff can best support them to ensure they can still access to the best possible care? **(NASS Domains-Embedding)**	Who might struggle?
If we want to set up a new way of doing appointments using technology, what should we measure to see if the new way works? **(NASS Domain-Value Proposition)**	

Is there something else that I have not asked you about, that you would like to tell me about your health and healthcare?

Thank you.

Topic guide –Staff

Researcher to introduce self, ask why participant interesting in taking part and orientate then as to what they will be discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.

Topic	Prompts
Background (NASS Domain Frailty and CGA)	
Please can you tell me a bit about your professional background and current role?	How long and it what capacity have you been working with older people? Describe the setting you work in.
Please can you tell me a bit about the older people that you work with and the kinds of things that you do with them in consultations	Asking them questions, checking their ability to do something, or taking any measurements?; do you do things differently if they are acutely unwell vs proactive/preventative care; how do you tailor assessments and care to meet individual needs/what is important to them
Current assessments (NASS Domains CGA, Organisation, Intended adopters and Embedding)	
What do you think older people/carers think about what you assess and how you conduct assessments (CGA)	Do you think that they might like anything to be done differently, or not done at all?
If a consultation goes particularly well, what is it that you have done, that might have made that a positive experience for them?	Is there anything that you might do differently? If yes: can you please describe in what circumstances you might do this? And why?
Are you able to give me any examples of how the pandemic has changed how you engage with older people specifically?	What has worked well for you? and what hasn't worked so well
Thinking ahead (NASS Domain Technology)	
Can you think of any ways in which you might be able to undertake more effective assessments with older people?	What are they hoping to achieve? What is stopping them?
One way that assessments might be undertaken different, is by them being undertaken remotely or by using different types of technology, and I am going to ask you your thoughts on some examples: • What do you think conducting assessments with older people remotely; for example by telephone or video? • What do you think about using different ways that older people might share their information with you; for example filling out questionnaires? • What do you think about using equipment that collects older people's information, for example taking their own blood pressure and sending to you, you will have access to the results? • What do you think about older people using a mobile phone to share information about how they are doing with you; for example, a weekly phone check-in with healthcare staff? • What do you think about older people using wearable technology, for example a pedometer or fitbit that collects data about their movement or exercise?	Prompt as to what informs their thinking, any preferences, and concerns or challenges eg any people/groups that not appropriate for/make things worse? How do you avoid inequalities in access to care When might these be helpful or beneficial to older people? What might they need to engage effectively
If we were to evaluate a new intervention for older people or, what do you think that we should measure to see if it works? **(NASS Domain-Value Proposition)**	How could we measure the impact of a new intervention?

Is there something else that I have not asked you about, that you would like to tell me about?

Thank you

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Section/Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	Methods/Design/ P4
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	Methods/Design/P4
Occupation	3	What was their occupation at the time of the study?	Methods/Design/P4-5
Gender	4	Was the researcher male or female?	Methods/Design/P4
Experience and training	5	What experience or training did the researcher have?	Methods/Design/ P4-5
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	Methods/Data collection / P6
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Methods/Data collection / P6 and additional files 1 and 2
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Methods/Design/ P4
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Methods/ Data collection and Data analysis/ P6, P7
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Methods/Sampling and recruitment/ P5
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	Methods/Sampling and recruitment/ P5
Sample size	12	How many participants were in the study?	Results/older people and Healthcare professionals/ P7-9
Non-participation	13	How many people refused to participate or dropped out? Reasons?	Methods/Sampling and recruitment/ P5
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	Methods/Data collection/ P6
Presence of nonparticipants	15	Was anyone else present besides the participants and researchers?	Results/older people/ P7

Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	Results/older people and Healthcare professionals/ P7-9
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Methods/ Data collection/ P6
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	NA
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	Methods/ Data collection/ P6
Field notes	20	Were field notes made during and/or after the inter view or focus group?	Methods/ Data collection/ P6
Duration	21	What was the duration of the inter views or focus group?	Results/older people and Healthcare professionals/ P7-9
Data saturation	22	Was data saturation discussed?	Methods/Sampling and recruitment/ P5
Transcripts returned	23	Were transcripts returned to participants for comment and/or	NA
Topic	**Item No.**	**Guide Questions/Description**	**Reported on Page No.**
		correction?	NA
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	Methods/ Data analysis/ P7
Description of the coding tree	25	Did authors provide a description of the coding tree?	Methods/ Data analysis/ P7
Derivation of themes	26	Were themes identified in advance or derived from the data?	Methods/ Data analysis/ P7
Software	27	What software, if applicable, was used to manage the data?	Methods/ Data analysis/ P7
Participant checking	28	Did participants provide feedback on the findings?	NA
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Results/ P9-16
Data and findings consistent	30	Was there consistency between the data presented and the findings?	Results/ P9-16 and Discussion/ P16-20
Clarity of major themes	31	Were major themes clearly presented in the findings?	Results/ P9-16
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Results/ P9-16

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

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How can we improve Comprehensive Geriatric Assessment for older people living with frailty in primary care and community settings? A Qualitative Study

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Abstract

Objective

With advancing age comes the increasing prevalence of frailty and increased risk of adverse outcomes (e.g. hospitalisation). Evidence for Comprehensive Geriatric Assessment (CGA), a multi-dimensional holistic model of care, is mixed in community settings. Uncertainties remain, such as the key components of CGA, who delivers it, and the use of technology. This study aimed to understand the perspectives, beliefs and experiences, of both older people and health professionals, to improve the current CGA, and explore factors that may impact on CGA delivery in community settings.

Design

A qualitative interview study was conducted with older people and health care professionals identified using a maximum variation strategy. Data were analysed using an abductive analysis approach. The Non-adoption, Abandonment, Scale-up, Spread and Sustainability (NASSS) framework

and the Theoretical Framework of Acceptability guided the categorisation of the codes, and identified categories were mapped to the two frameworks.

Setting

England, United Kingdom

Results

Twenty-seven people were interviewed, constituting 14 older people and 13 healthcare professionals (HCPs). We identified limitations in the current CGA: a lack of information sharing between different healthcare professionals who deliver CGA; poor communication between older people and their HCPs; and a lack of follow-up as part of CGA. When we discussed the potential for CGA to utilise technology, HCPs and older people varied in their readiness to engage with it.

Conclusions

Viable solutions to address gaps in the current delivery of CGA include the provision of training and support to use digital technology and a designated comprehensive care coordinator. The next stage of this research will use these findings, existing evidence and stakeholder engagement, to develop and refine a model of community based CGA that can be assessed for feasibility and acceptability.

Keywords

Ageing, comprehensive geriatric assessment, digital technology, frailty, qualitative.

Strengths and Limitations

- Use of qualitative interviews enabled rich data on exploration and synthesis of older people and healthcare professionals.
- Our theoretically informed qualitative research and stakeholder insights identified both challenges to the current delivery of CGA as well as opportunities for the improvement of CGA for older people with frailty.

- Our study is deliberately exploratory; thus the findings may not be transferable to other older people and healthcare professionals. However, we recruited older people and HCPs with a wide variety of views and experiences.

Introduction

Between 2020 and 2050 the number of people worldwide aged over 80 will triple to reach 26 million (1). With ageing, people are more susceptible to develop multiple, long-term conditions that reduce their independence and quality of life (1-4). This is due to underlying factors, such as falls, frailty, and delirium (1, 3).

Frailty is a clinical syndrome where multiple body systems deteriorate leading to increased vulnerability (3, 5). Frailty increases the risk of falls, disability, hospitalisation, mortality, and contact with healthcare services (5, 6). Prevention and reversal of frailty can enable people to stay well and live independently for longer (3). Frailty affects half of the UK population aged over 85 and costs the publicly funded National Health Service (NHS) £5.8 billion per year (6). A key priority of the NHS in the UK is to support older people with frailty to manage their long-term conditions (3, 7).

Older people living with frailty need robust interventions tailored to the complexity of their care needs (3, 8). Comprehensive Geriatric Assessment (CGA) is a multi-dimensional diagnostic and therapeutic intervention that includes an assessment of physical, cognitive and psychosocial components with the development of a holistic management plan in partnership with the older person with frailty (8). CGA delivered in acute, primary and community settings aims to prevent deterioration and complications associated with frailty (3, 9). However, the effectiveness of CGA for older people with frailty in primary care and community settings is mixed (8, 10, 11). Ho et al reported benefits in terms of the likelihood of living at home, reduced mortality, improved cognition, and activities of daily living, but with uncertain benefits on quality of life (11), whereas Briggs and colleagues found no difference in mortality, activities of daily living, quality of life and care home

admissions (8). Descriptions of CGA components often lack detail, including the delineation of staff involved in delivery, and an understanding about factors that affect implementation are limited (12).

Recent NHS initiatives to strengthen the efficiency of outpatient services using alternative approaches require consideration. For example, there is growing interest in the use of wearable devices to monitor patients (7). The NHS Long Term Plan, and Digital Transformation Plan, recommend the use of digital equipment in the assessment and monitoring of older people with frailty; with the option of using wearable devices to ensure services are inclusive and available to all (7, 12). However, digital technologies are not part of the existing evidence for CGA.

Regardless of the complexity and diversity of the needs of older people with frailty, some face inequities in access to interventions which may help to maintain or improve their independence (3). For example, whilst telemedicine can beneficial, cost-effective and acceptable to older people (13), there are concerns about digital exclusion (14) and risks that important signs and symptoms could be missed (15). Improving the effectiveness and efficiency of CGA (11) requires exploration of how individual components may work and how the overall intervention can be enhanced. The Digital and Remote Enhancement for the Assessment and Management of Older People with Frailty (DREAM) project aimed to develop a community-based model of CGA that incorporated technology. This qualitative study aimed to understand perspectives, beliefs and experiences of both actual and potential providers and users to improve the current CGA and explore the factors that may impact on CGA delivery in community settings, including the use of technology.

Methods

Design

A qualitative interview study with older people and health care professionals was conducted. AM, a female post-doctoral research fellow and pharmacist, collected and analysed the data in collaboration with VG (a female academic physiotherapist) and JF (a female medical sociologist). All

had experience of conducting qualitative research. Ethical approval was issued by the University of Exeter, College of Medicine and Health Research Ethics Committee (Ref 509407). The study has been reported according to the Consolidated Criteria for Reporting Qualitative Study (COREQ) guidelines (16).

Patient and Public Engagement

Patient Public Involvement and Engagement (PPIE) and Health and Care Professional (HCP) advisory groups contributed to the development, design and conduct of this research through a series of workshops. They contributed to developing and piloting topic guides for the interviews and provided analytical insight into preliminary findings through discussions.

Sampling and Recruitment

Older people

Participants were recruited from the Community Ageing Research (CARE) 75+ (17) or the Oxford Pain Activity and Lifestyle (OPAL) (18) cohorts. Both CARE75+ and OPAL are representative, prospective longitudinal studies designed as both epidemiological studies of older people living in the community in the UK and as recruitment platforms to help overcome some of the challenges of older people being under-represented in research (19). We applied a maximum variation sampling strategy to identify Care75+ and OPAL participants who had consented to be contacted, to capture diversity in gender, ethnicity, living circumstances, socioeconomic factors, geography, frailty, sensory (e.g. visual or hearing problems), and memory problems. Frailty for the CARE 75+ Cohort was assessed using the Edmonton Frailty Index (20) and the Electronic Frailty Index (19) and for the OPAL cohort was assessed using Tilburg Frailty Indicator (21). Batches of invitations to participate were sent out to 15-20 people at a time by AM (for Care75+ participants) and the OPAL research team (for OPAL participants). In total, 132 invitations were sent out. We continued recruiting from May 2022 to December 202 until our concurrent analysis yielded an in-depth understanding of where and how CGA might be improved. (22)

Healthcare Professionals

For healthcare professionals, we also used a maximum variation sampling strategy (23), to ensure representation of professional background, geographical location, and gender. We invited health and social care professionals working in non-hospital settings in the UK working with older people living with frailty via social media (Twitter and Facebook) and via professional networks.

All older people and healthcare professionals who expressed an interest in taking part were recruited.

Data collection

We developed semi-structured topic guides (23, 24) for older people (Additional file 1) and HCPs (Additional file 2) based on a review of literature and online workshop discussions with our two advisory groups made up of older people, family members, and HCPs. We did not use the term CGA in the interviews with older people as advised by the two advisory groups. Topic domains were aligned to the Non-adoption, Abandonment, Scale up, Spread and Sustainability (NASSS) framework to ensure collection of rich data and to explicitly focus our analysis on how best to improve CGA (25). The NASSS framework has previously been used to explain the interacting factors that affect the implementation of complex interventions that utilise technology and generate mixed outcomes (25, 26). AM piloted the topic guide with members of the PPIE advisory group and refined one question (concerning outcomes to be measured) for clarity. The topic guide enabled consistency in the data collection, with the interviews flexible enough to allow the participants to explain what was important to them (27). The interviews were conducted face-to-face, via telephone or video call, depending on the participants' preference (23). AM introduced herself and explained the aim of the study to the interviewee at the beginning of each interview. The audio-recorded interviews were transcribed by a GDPR compliant transcriber and checked for accuracy by AM. Fieldnotes captured the context of the interview. AM had no previous contact with any of the participants.

Data analysis

We undertook abductive analysis (28), and used NVivo 13 (Release 1.7) (29) to manage the data. This involved an iterative approach to analysis, to facilitate understanding (27, 30). We coded the interviews in cycles, with deductive codes from the literature and inductive codes generated by AM, identifying similar ideas or concepts that could be categorised into a code (27, 31). This enabled balance between data relating to pre-existing concepts and data based on the perspectives of the participants (28, 32). We (AM, VG and JF) then developed a conceptual map of the different participants' perspectives (24). The NASSS framework, and the Theoretical Framework of Acceptability (25, 33) guided the categorisation of the codes. The categories were then mapped to the two frameworks, which enabled further elaboration of the complexity within the domains of an intended CGA intervention that utilises technology. For example, the broad analytical category 'Organisation' was constituted by various coding categories, including person-centred and accessible records, digital enabling for staff, information sharing between HCPs and continuity of care. We used a conceptual map to create a hypothetical case (vignette) of an older person who participated in a CGA that used technology (34). We used the vignette in the final three interviews with HCPs, to extend our understanding of the potential afforded by technology. Preliminary findings were presented to the advisory groups for discussion and consideration of their interpretations.

Results

Older people

Fourteen older people consented to participate and were interviewed. Respondents were aged between 75 and 90 years old, were evenly split between males and females, and included participants with hearing and/or visual impairment, mobility impairments, and with one or more long term condition. One participant asked to be interviewed in the presence of their carer (a spouse). The interviews lasted between 16 and 92 minutes. (Table 1).

Table 1 Demographic characteristics of older people with frailty

Participant Pseudonym	Gender	Age group	Current residence in England	Living circumstances	Mode of interview
Robert	Male	81-85	North East	Live alone	Telephone interview
James	Male	81-85	South West	Live alone	In-person interview
Richard	Male	81-85	South West	Live with spouse	Online audio call
William	Male	86-90	North East	Live with spouse	Online video call
Barbara	Female	81-85	North East	Live with spouse	Telephone interview
Gary	Male	75-80	North East	Live with spouse	Telephone interview
Karen	Female	75-80	South East	Live alone	Online video call
Steven	Male	75-80	South East	Live with spouse	Telephone interview
Shirley	Female	75-80	Midlands	Live alone	Telephone interview
Frances	Female	86-90	South East	Live alone	Telephone interview
Carol	Female	81-85	North West	Live alone	Telephone interview
Donna	Female	81-85	South East	Live alone	Telephone interview
Frank	Male	75-80	Midlands	Live with spouse	Telephone interview
Lois	Female	86-90	South West	Live with spouse	Telephone interview

Healthcare professionals

The thirteen HCPs came from different professional backgrounds, and from different geographical areas of England. All of the participants were working, or had worked, with older people with frailty, for a duration of two to 30 years (Table 2). The interview duration ranged between 33 and 160 minutes.

Table 2 Demographic characteristics for HCPs who participated in the study

Participant number	Profession	Years of providing care to older people	Location in England	Gender	Mode of interview
HP1	Frailty assistant practitioner	20	South West	Female	Online
HP2	Nurse	15	South West	Male	Online
HP3	GP	Retired	North East	Female	Online

HP4	Physiotherapist	19	South West	Female	Online
HP5	GP	16	South West	Female	Online
HP6	Physiotherapist	30	South West	Female	Online
HP7	Nurse	15	South West	Female	Online
HP8	Nurse	2	South East	Female	Online
HP9	Occupational therapist	10	South East	Female	Online
HP10	Consultant Geriatrician	23	North West	Male	Online
HP11	Consultant Geriatrician	19	Midlands	Female	Online
HP12	Physiotherapist	4	Midlands	Female	Online
HP13	Pharmacist	3	North West	Female	Online

We identified patterns about the conditions to enhance CGA across the two data sets, then classified these patterns into the eight domains of the NASSS framework and to the Framework of Acceptability (25, 33). Here we present the four domains that were most important for both the patient and professional participants: frailty (the condition), intended adopters (both professional and lay), organisational factors (such as workforce challenges), and acceptability (of technology and assessment).

Frailty

Amongst HCPs, there was an appreciation of the complexity of frailty. Regardless of whether they have a need for acute care or not, all older people with frailty have complex needs due to having multiple long-term conditions, impairments and/or socioeconomic factors:

> *"Most of them are aged 80 almost all of them are frail and so they have multiple chronic conditions, they have got polypharmacy they tend to need some help with one or more activities of daily living". (HP13, Pharmacist)*

HCPs from different professions tend to provide a comprehensive assessment that involves physical, psychological and social needs for older people with acute and non-acute care needs. However, there is a need to provide older frail people with assessment prior to a crisis developing:

> *"All the domains yeah, the psychological, physical all those you know functional, environmental you know do you live in a house, a flat, bungalow, do you sleep upstairs, any falls you know any equipment in the toilet, that kind of thing and social you know do you get out." (HP12, Physiotherapist)*

> *"So, if you're trying to keep somebody weller for longer, then any of those proactive interventions rather than waiting until they get to crisis point." (HP9, Occupational therapist)*

We interviewed older people with frailty who were socioeconomically disadvantaged and/or experienced sensory or physical impairment that can exacerbate the complexity of their care needs. For example, Carol had financial challenges, restricted mobility, visual impairment, multiple long-term conditions, and a high risk of falling. Carol had limited choices in access to care, because of her restricted ability to travel to appointments, lack of a support network, and no access to technology:

> *"I've been a single person all my life and I get the basic state pension. So, I've never ever been able to afford the technology that people use every day to day in these days and that's the reason I don't have it." (Carol, 81-85 years old)*

On the other hand, Karen lived alone, but has regular communication with family and friends. During her health and care journey, Karen was able to enact her own health decisions and avoided long NHS waiting time for tests and referrals:

> *"I only saw the consultant yesterday, so the next steps haven't been put in place yet. Unfortunately, I have had to pay privately for it and the NHS seems to be in such a mess and the doctor did want to send me off for tests but she couldn't justify so, more or less saying well you know it is as it is we can't do anything more for you because we haven't got proof that this test or that test is something we can do, something we can justify. […] I'll have to pay for that privately otherwise I will just be waiting too long. You know I am*

getting on I don't want the last two or three years probably of my life to be sitting around at home feeling sorry for myself." (Karen, 75-80 years old)

Intended adopters

Some HCPs indicated that an HCPs occupational background may inform the scope of assessment during the CGA, and the quality of the CGA that they offer. A nurse who led a frailty team showed appreciation of the range of HCP backgrounds in their team, which enabled them to involve the most suitable HCP (e.g. in terms of their skill set), to meet the unique needs of the older person:

"obviously if it was things like their ability to perform their physical activity to daily living that maybe something that I would involve one of, I've got a colleague who is Band 4 assistant practitioner whose got a therapy background she's very good at looking at the nuts and bolts of how people physically manage […] I will also do joint visits with OTs and physios if we're feeling that we need to, that there's a, that the referral makes it sound like this is very much that mixed picture of it's not just a medical requirement or a strict nursing requirement that there's an overlap with where my therapy colleagues would come in". (HP2, Nurse)

This contrasted consultant geriatrician (HP11) who also led a frailty team. HP11 indicated that regardless of the different backgrounds of HCPs in their team, there should be no differences in the CGA that they provide to older people with frailty. However, HP11 highlighted that some professions may have limited ability to understand the complexity of older people's care needs. This was congruent with the views from older people who thought that their care needs could be managed better by an HCP with knowledge and experience of older people with frailty:

"They all do the same because they've all had their advanced […], course the advanced assessment healthcare assessment course. They've all done the same course ok,". (HP11, Consultant Geriatrician)

"You could have one doctor who is in the practice who specialised in old people you know just for the aged to sort of he specialised in the aged. […] where old people could feel they could go […] rather than a general practitioner maybe somebody that was for the old and the frail." (Barbara, 81-85 years old)

A GP (HP3) thought that the ability to deliver CGA depends upon the investigative and communication skills, and previous experience of staff, and it is not restricted to a particular background:

> *"So, I tend to work on a concept that I don't like thinking about professions doing things I like to think about competencies." (HP3, GP)*

Some HCPs suggested that HCPs may require training to improve interpersonal skills, in terms of communication and attention to detail, to ensure enhancement of CGA. For example, HP12 (a Physiotherapist) shared their personal experience of developing their investigational skills when providing remote CGA over time. HP7 (a Nurse) shared their experience of supporting new HCPs in their team to learn how to pick-up non-verbal cues during home visits, to support identifying care needs and provide CGA.

Organisation

Interviewing HCPs from different geographical areas of England allowed us to explore organisational limitations, which would require innovation to increase readiness for new forms of technology-informed care delivery.

Some HCPs made references to fear and resistance to trying new ways of care delivery. For example, a nurse (HP2) referred to themselves as 'a dinosaur' when it comes to trying new technologies. Similarly, a frailty assistant practitioner (HP1) also indicated that practitioners may need support from colleagues, while a consultant geriatrician (HP11) shared the challenges they had when using technology and the time needed for training to use new technology:

> *"There's also the training aspect of it. Training takes a long time you go in and sit down and have training whatever new technology comes you have to find time to go for training and you actually don't get to understand its use until you start using it and the problems that you get when you start using it". (HP11, Consultant Geriatrician)*

Almost all HCPs discussed the negative impact of using different clinical databases in various settings on their ability to share and/or access patients' records. HCPs discussed the importance of having a well-established information sharing process between HCPs in different settings in enhancement of CGA. HCPs shared their experiences of meeting the challenges in information sharing. For example, sharing data in regular Multi-Disciplinary Team (MDT) meetings, provides access to the GP medical records for HCPs who work in the community, which enables them to effectively support the older people with whom they work. Some organisations have a sharing document that all HCPs involved in CGA can use to input and share data, which staff found beneficial in terms of the availability of information and efficiency in obtaining key information when needed:

"I've not seen they've had a CGA, their clinical frailty scale is this, blah, blah, blah never seen it never ever. Never ever, ever seen it. So, information is not coming it is not flowing". (HP12, Physiotherapist)

" I just from previous experience I knew these sorts of things I needed to have so I made sure that I discussed it with the CCG and got them to put this in place because I didn't want to be spending exactly like the nurse, two hours, trying to get information when in five minutes I can have that information." (HP10, Consultant Geriatrician)

"So, for me to be able to know what medicines somebody is on, I have to have access to that or I've got ask somebody who has access to check for me ok". (HP11, Consultant Geriatrician)

Lack of staff capacity was perceived as a limitation for delivering CGA by all HCPs, which may inhibit delivery of timely support which an older people may require. Some older people recognised the limited staff availability and the increasing demands on the GP practices that inhibit continuity in care. For them, lack of continuity decreases their engagement with their care:

"More of us, more availability [..] I mean we are running its sort of like a virtual ward model but it's going to be, we have less staff on at a weekend. So, our capacity to take new referrals on a Friday and over the weekend is a lot less." (HP9, Occupational therapist)

> *""When you see the doctor, you know you barely it's a locum that I see I don't see my own doctor." (Shirley, 75-80 years old)*

Other older people with frailty understood the current workforce challenges in the NHS and suggested that improved communication between HCPs and sharing information may mitigate the current lack of continuity:

> *"GPs talk to each other and that you know if you go in and you see somebody who is not your designated GP you know that fine well that the notes are there […]. So, you feel perfectly happy that you know whoever you are seeing, knows what they are talking about." (Lois, 86-90 years old)*

However, we identified that when an older person can identify a key contact person to support them, this can mitigate a lack of continuity in their care, because they key person can co-ordinate their care and ensure the continuous flow of communication:

> *"So, I sort of stayed involved in this case as a coordinating factor because you know it happens when too many people are involved things the outcome might not be good or the people can get lost in translation and so I managed to speak to the mental health team and everything and draw all the people that the GP had referred to, to a point where I said now, you need to take this forward." (HP12, Physiotherapist)*

Acceptability

We identified elements that might influence acceptability by older people with frailty, that should be taken into consideration when enhancing CGA.

Although HCPs perceived that older people were satisfied with CGA and the care provided to them, some older people indicated that they could not freely communicate with HCPs and express their needs, because of perceived short appointments with their GP. Furthermore, older people lacked trust in their HCPs, or the clinical decisions made about their treatment plan:

> *"I would say the consistent feedback is normally that they're greatly relieved that we've given the time 'cos we don't time specify our visits" (HP2, Nurse)*

> *"No, it's so quick and it's so, I mean in person, well I wouldn't say personal you know when you speak to a doctor like I did with my old doctor if he, it was just a different attitude towards you, it's like a conveyor belt, you come in, you go out, you come in and you go out so, you know you just feel it's not the same what it was before." (Shirley, 75-80 years old)*

Moreover, HCPs acknowledged the variation in older people readiness to engage with new ways of care delivery:

> *"There is a high risk of inequalities because anytime you are going introduce something different new, there are going to be people who can use it very easily and there are going to be those who can't for whatever reasons". (HP13, Pharmacist)*

This aligned with the findings from interviews with the older people themselves. For example, Karen showed readiness to engage with new ways of receiving technology-informed care because she had previous experience of using technology in her healthcare, and in communication with family members. In contrast, Shirley rejected engagement with new forms of remote appointments:

> *"They did ask me once yes, but I said, well, I don't know how to do it, let's put it that way a video appointment I mean I don't […] I have a mobile phone so, you know I just don't know how to do it. So, the other solution was that they speak to me over the phone". (Shirley, 75-80 years old)*

Lack of physical access to technology (e.g. a device or internet connection) can inhibit an older person's opportunity to learn how to use technology, which may subsequently limit their readiness to engage with new forms of technology informed care. Therefore, those with frailty may require additional support to engage with CGA that utilises technology. For example, older people with sensory impairment may require specialist adaptation to their device, or support from a carer to engage; whereas older people who are already digitally literate may only need educational input on how to use a new technology.

HCPs recognised the variation in the needs and preferences of older people with frailty and discussed how they tailor CGA to the person's needs:

> *"I would say we're able to be very person-centred we're not looking at things from a clinician's perspective only we will explore things from the patient's perspective in terms of what they think is their problems." (HP4, Physiotherapist)*

Some HCPs thought that the presence of a carer, a family member or support network may increase a frail older person's acceptance of CGA that utilises technology. However, HCPs acknowledged the higher demands on the carer which may reduce the support they can provide, to help the older adult engage with technology. A GP (HP3) shared examples of caregivers who inadvertently disempower the older person, in terms of decision-making about their healthcare choices. Older people may therefore require support from a wider network, and not only their carer:

> *"Some of them have families who help them but they still like you know eye contact, physical contact and the written word, you know paper, hard copy of anything. So, I am afraid that's something that they'll eventually all pop off but and thankfully the younger ones are you know quite capable of using all these devices." (Barbara, 81-85 years old)*

HCPs may not be able to provide the required follow-up after an assessment, important for tracking the referrals to other services if needed and the management plan provided to the patient. Similarly, older people explained the challenges that they were facing in following-up the HCPs; for example, to find out the result of a test, or to book an appointment:

> *"I would like to think we're good at going out and identifying the problem we're good at negotiating a management plan with someone it's then how do you monitor the effect of that management plan". (HP2, Nurse)*

> *"I had to phone my practice after I'd been to see the 111 doctor and she said get in touch with your practice and I got this sort of non-committal reply oh, well you'd better start your antibiotics and I was quite disappointed that they didn't get in touch with me because they'd given me that advice without having seen a report and I thought well I would have*

expected something to come back but like I said, I was really not well enough to do anything about it". (Donna, 81-85 years old)

Discussion

This study explored the factors that may impact on CGA delivery in community settings, including the use of technology. This research adds to the current growing evidence on challenges on delivering effective CGA in community settings and identified factors to enhance CGA in community settings from the perspectives of older people and HCPs.

In this study, we identified key challenges to the enhancement of CGA in the community, including: information sharing between different HCPs who are delivering the CGA; communication between older people and their HCPs; and follow-up appointments after conducting the CGA. From the current challenges that were explained by participants, and suggestions which they made to address them, workshop discussions with advisory group members and existing literature, we identified factors to enhance CGA in the community.

Both HCPs and older people considered that the delivery of CGA should not be limited to those from specific professions but should be based upon HCPs competency and knowledge of the complexity of need for older people with frailty. This finding aligns with the Ageing Well Network of Enhanced Care for older People (EnCOP) competency framework (35); an aim of which is to enhance staff competency in working anywhere in the care system (35). The Health Education England and NHS England commissioned the Frailty Core Capabilities Framework in 2018 to identify skills and behaviours required to deliver high quality of care to older people with frailty (36). However, there is limited use of the framework in commissioning education or training, reflected in the results of evaluation surveys that were conducted in 2018 and 2019 (37). We suggest that upskilling staff and providing them with appropriate training to improve their communication and investigation skills may be a viable solution to mitigate the negative impact of workforce shortages on the effectiveness of CGA.

From conducting interviews augmented by workshop discussions with advisory group members, we identified the need for assigning a member of staff or MDT team to a co-ordinating role, which we designated as “Comprehensive Care Coordinator”. This person could coordinate the delivery of CGA by facilitating information sharing between different HCPs, communicating with older people with frailty on a regular basis, and ensuring that the management plan including referrals is acted upon. Designating a care coordinator may improve continuity of care with one point of contact and provide reassurance through a therapeutic, long-term relationship. This may provide reassurance to the older person and ensure effective follow-up of any management plan. Care coordinator roles in the community, including case managers, may reduce emergencies. However, evidence shows variation in the role in different studies in terms of duration and frequency of home visits and HCPs who coordinated the care (11, 38, 39). Further research needs to identify who could best coordinate care in older people and what the best approach may be.

Moreover, HCPs agreed that utilising technology in the delivery of CGA may enable HCPs to provide support for older people without compromising their follow-up. The NHS plan highlighted the need for enhancing the use of technology in healthcare, to change how care is being provided to patients; and to create joined up computer systems that give staff sufficient access to data, to provide improved care for patients (7). However, there is a need for digital upskilling of staff to support their effective use of technology in healthcare (40).

Different IT-systems and a lack of information governance arrangements across different settings currently inhibits information sharing and creates tension between HCPs in different settings. HCPs told us that the lack of connection between different systems must be addressed, if they are to deliver an effective CGA. Similarly, older people mentioned how lack of access to information magnified unequal access to effective CGA, and support and care for older people with frailty. In February 2023, NHS Digital became responsible for digital technology, data and health and care delivery. This has the potential to address some of the challenges in information sharing (41).

Existing research has identified the need for convenient platforms and improved digital records for integrated care services for older people (including CGA) that maintain privacy and security when sharing patient data between MDTs (40, 42). Such integrated platforms may enhance communication and coordination of care (40, 42). However, resolving existing operational complexities is likely to require additional funding and the creation of interoperable IT-systems (7, 40, 41, 43).

We found that socioeconomic factors, including living circumstances, income, and social network impacted older peoples' treatment choices; in terms of whether they visited a clinical specialist and waiting times for NHS appointments. This implies that when developing the CGA that utilises technology we need to consider how to mitigate socioeconomic factors that inhibit access and capacity to obtain the benefits of using digital equipment in the assessment and follow-up. Existing research suggests that digital interventions are less effective in populations with socioeconomic disadvantage compared with those with higher socioeconomic status (44). Although the COVID 19 pandemic accelerated the shift to online resources and services, and changed patient perceptions and willingness to use technology, it increased digital inequalities (45, 46). Amongst those aged 75 and over in the UK, 42% do not use the internet, reporting a lack of digital skills as the main reason (47). However, the older population is changing, and the next generation of older people are more familiar with using technology, with 77% of those aged over 55 using a smart phone (48) and 55% of those aged 50-64 using the internet most days (47). However, increasing physical access to connected devices and the internet alone may not be enough to reduce inequalities in access to CGA that utilises technology (44, 45, 49). Therefore, training and support would be needed to ensure older people could be digitally enabled; however, this may not be appropriate for everyone, and support would need to be individualised (47).

Using technology for monitoring and supporting older people with frailty is an NHS priority, and over time there may be more opportunities for older people with frailty to access and use technology (7).

Research now needs to assess if these changes positively affect older people with frailty, support engagement with CGA that utilises technology, and whether they diminish inequalities in access to technology informed care.

Qualitative interviews enabled exploration and synthesis of older people and HCPs perspectives. Although we recruited a range of older people and HCPs with a wide variety of views and experiences, our findings may not be transferable to all older people and HCPs who have different experiences or perspectives (e.g. we were unable to recruit any social workers despite employing several strategies) (24, 27). However, our theoretically informed qualitative research and stakeholder insights identified both challenges to the current delivery of CGA as well as opportunities for the improvement of CGA for older people with frailty.

Conclusions

We identified four factors to enable implementation of CGA in community: enhancing staff competency in working with older people with frailty, creating interoperable IT-systems, assigning a care coordinator for older people with frailty, and mitigation of the impact of inequalities in access to digital care. Introducing technology and a designated comprehensive care coordinator may be vital to addressing gaps in the current provision of CGA. These solutions may also positively affect the acceptability of CGA in older people with frailty. The next stage of this research will further develop, refine and test a model of improved CGA in community setting.

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Authors' Contributions

VG and JW conceived the ideas for the research with the help of JF and SL. AM collected the data. AM, JF and VG analysed the data. AM led the writing with the help of JF and VG. NM, HL, SL and SC critically revised the manuscript. All authors have approved the final version of the article.

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Conflict of interests

None.

Ethics approval and consent to participate

All the participants gave written informed consent and consent to participate. Ethical approval was issued by the University of Exeter, College of Medicine and Health Research Ethics Committee (Ref 509407).

Consent for publication

The participants gave their consent to participate in the study and to publish anonymised quotes from the interview transcripts. The names of the participants have been anonymised.

Availability of data and materials

Supplementary data mentioned in the text are available in the additional files.

Additional files

Additional file 1 contains topic guide for interviews with older people.

Additional file 2 contains topic guide for interviews with HCPs.

Topic guide –Older people and carers

Researcher to introduce self, ask why participant interesting in taking part and orientate then as to what they will be discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.

Topic	**Prompts**
Background (NASS Domain Frailty)	
Could you tell me a bit about yourself and what is important to you in your life /lives?	Who they are? Where they live? What do they do? Support networks
Does your health or personal situation impact on what is important to you?	How? why?)
Appointments with health and care staff (NASS Domains CGA, Organisation, Intended adopters and Embedding)	
Please can you think back to a recent appointment with a health or social care professional (such as a Dr or nurse), and tell me about what happened in that appointment	Thinking about things like asking questions, checking your ability to do something, or taking any measurements? Did you get the chance to say anything such as what is important to you
What did you think about how that appointment was conducted?	Whether they would have liked anything to have been done differently, or not done at all? what you would have liked to have happened? And why?
If an appointment went well, what were the things that were done, that made that a positive experience for you?	Anything that could have been done differently?
Are you able to give me any examples of how the pandemic has changed how you engage with health and care staff?	What has worked well for you? What hasn't worked so well?
Thinking ahead (NASS Domain Technology)	
We are exploring different ways health and care professionals might conduct appointments with older people or find out about a person's health. I am going to ask you your thoughts about different ways they could do this: • What do you think about appointments being done remotely; for example by telephone or video? • What do you think about using different ways of sharing information on their current health with staff; for example filling out questionnaires? • What do you think about using equipment that collects information about your health, for example taking your own blood pressure and sending results to your GP? • What do you think about using a mobile phone to share information about how you are doing; for example, a weekly phone check-in with health or care staff? • What do you think about using wearable technology, for example a pedometer or fitbit that collects data about your movement or exercise?	What informs their thinking, any preferences, concerns or worries? Can you think of any other older people for whom these might not be appropriate, could they make things worse, What sort of problems may pose particular challenges? Could these be helpful or beneficial to older people? What might be needed to use effectively?
For those who might struggle with technologies, can you think of ways in which staff can best support them to ensure they can still access to the best possible care? **(NASS Domains-Embedding)**	Who might struggle?
If we want to set up a new way of doing appointments using technology, what should we measure to see if the new way works? **(NASS Domain-Value Proposition)**	

Is there something else that I have not asked you about, that you would like to tell me about your health and healthcare?

Thank you.

Topic guide –Staff

Researcher to introduce self, ask why participant interesting in taking part and orientate then as to what they will be discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.

Topic	Prompts
Background (NASS Domain Frailty and CGA)	
Please can you tell me a bit about your professional background and current role?	How long and it what capacity have you been working with older people? Describe the setting you work in.
Please can you tell me a bit about the older people that you work with and the kinds of things that you do with them in consultations	Asking them questions, checking their ability to do something, or taking any measurements?; do you do things differently if they are acutely unwell vs proactive/preventative care; how do you tailor assessments and care to meet individual needs/what is important to them
Current assessments (NASS Domains CGA, Organisation, Intended adopters and Embedding)	
What do you think older people/carers think about what you assess and how you conduct assessments (CGA)	Do you think that they might like anything to be done differently, or not done at all?
If a consultation goes particularly well, what is it that you have done, that might have made that a positive experience for them?	Is there anything that you might do differently? If yes: can you please describe in what circumstances you might do this? And why?
Are you able to give me any examples of how the pandemic has changed how you engage with older people specifically?	What has worked well for you? and what hasn't worked so well
Thinking ahead (NASS Domain Technology)	
Can you think of any ways in which you might be able to undertake more effective assessments with older people?	What are they hoping to achieve? What is stopping them?
One way that assessments might be undertaken different, is by them being undertaken remotely or by using different types of technology, and I am going to ask you your thoughts on some examples: • What do you think conducting assessments with older people remotely; for example by telephone or video? • What do you think about using different ways that older people might share their information with you; for example filling out questionnaires? • What do you think about using equipment that collects older people's information, for example taking their own blood pressure and sending to you, you will have access to the results? • What do you think about older people using a mobile phone to share information about how they are doing with you; for example, a weekly phone check-in with healthcare staff? • What do you think about older people using wearable technology, for example a pedometer or fitbit that collects data about their movement or exercise?	Prompt as to what informs their thinking, any preferences, and concerns or challenges eg any people/groups that not appropriate for/make things worse? How do you avoid inequalities in access to care When might these be helpful or beneficial to older people? What might they need to engage effectively
If we were to evaluate a new intervention for older people or, what do you think that we should measure to see if it works? **(NASS Domain-Value Proposition)**	How could we measure the impact of a new intervention?

Is there something else that I have not asked you about, that you would like to tell me about?

Thank you

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Section/Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	Methods/Design/ P4
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	Methods/Design/P4
Occupation	3	What was their occupation at the time of the study?	Methods/Design/P4-5
Gender	4	Was the researcher male or female?	Methods/Design/P4
Experience and training	5	What experience or training did the researcher have?	Methods/Design/ P4-5
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	Methods/Data collection / P6
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Methods/Data collection / P6 and additional files 1 and 2
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Methods/Design/ P4
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Methods/ Data collection and Data analysis/ P6, P7
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Methods/Sampling and recruitment/ P5
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	Methods/Sampling and recruitment/ P5
Sample size	12	How many participants were in the study?	Results/older people and Healthcare professionals/ P7-9
Non-participation	13	How many people refused to participate or dropped out? Reasons?	Methods/Sampling and recruitment/ P5
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	Methods/Data collection/ P6
Presence of nonparticipants	15	Was anyone else present besides the participants and researchers?	Results/older people/ P7

Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	Results/older people and Healthcare professionals/ P7-9
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Methods/ Data collection/ P6
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	NA
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	Methods/ Data collection/ P6
Field notes	20	Were field notes made during and/or after the inter view or focus group?	Methods/ Data collection/ P6
Duration	21	What was the duration of the inter views or focus group?	Results/older people and Healthcare professionals/ P7-9
Data saturation	22	Was data saturation discussed?	Methods/Sampling and recruitment/ P5
Transcripts returned	23	Were transcripts returned to participants for comment and/or	NA
Topic	**Item No.**	**Guide Questions/Description**	**Reported on Page No.**
		correction?	NA
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	Methods/ Data analysis/ P7
Description of the coding tree	25	Did authors provide a description of the coding tree?	Methods/ Data analysis/ P7
Derivation of themes	26	Were themes identified in advance or derived from the data?	Methods/ Data analysis/ P7
Software	27	What software, if applicable, was used to manage the data?	Methods/ Data analysis/ P7
Participant checking	28	Did participants provide feedback on the findings?	NA
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Results/ P9-16
Data and findings consistent	30	Was there consistency between the data presented and the findings?	Results/ P9-16 and Discussion/ P16-20
Clarity of major themes	31	Were major themes clearly presented in the findings?	Results/ P9-16
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Results/ P9-16

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.