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How have remote care approaches impacted continuity? A mixed-studies systematic review

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Abstract 249

Background:

The value of continuity in primary care has been demonstrated for multiple outcomes. However, little is known about how the expansion of remote and digital care models have impacted continuity.

Aim:

To conduct a mixed-methods systematic review to explore how expansion of remote and digital care models have impacted continuity.

Design and Setting:

A systematic search of electronic databases with snowball sampling to identify relevant qualitative and quantitative studies.

Methods

17 English-language studies (any country, 2000-2022) exploring remote or digital approaches in primary care and continuity were identified. Relevant data were extracted, analysed using GRADE-CERQual, and narratively synthesised.

Results

The specific impact of remote approaches on continuity was rarely overtly addressed. Some patients expressed a preference for relational continuity depending on circumstance, problem, and context, whilst others prioritised access. Clinicians valued continuity with some viewing remote consultations more suitable for patients where there was high episodic or relational continuity. With lower continuity, patients and clinicians considered remote consultations harder, higher risk, and poorer quality. Some evidence suggested remote approaches, and/or their implementation risked worsening inequalities and causing harm by reducing continuity where it was valuable. However, if deployed strategically and flexibly, remote approaches could improve continuity.

Conclusion

The dearth of evidence around continuity in a remote and digital context is troubling. Further research should explore the links between the shift to remote care, continuity and equity, using real-world evaluation frameworks to ascertain when and for whom continuity adds most value and how this can be enabled or maintained.

How this fits in

The value of continuity in primary care has been repeatedly demonstrated for multiple outcomes. However little is known about how the expansion of remote and digital care models have impacted continuity. Here we demonstrate a disturbing lack of systematic research in this area and emphasize the need for real world explorations of the links between the shift to remote care, continuity and equity to ascertain when and for whom continuity adds most value and how this can be enabled or maintained.

Background

Primary care, the “*provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community*”(1, 2) has four key attributes: first contact access; a long-term person focus (i.e. continuity); comprehensiveness; and coordination, with a secondary focus on family centeredness, cultural competency and community orientation(3, 4). Healthcare systems with strong primary care sectors are associated with improved and more equitable health outcomes and greater cost efficiencies than those more reliant on specialist services(5, 6).

‘Continuity of care’ is an over-arching concept that conveys a tacit sense of stability, consistency, and connection in the relationships and processes that comprise the experience of healthcare. Over the years continuity has been understood in a range of ways, from ‘*seeing the doctor you know and trust*’ to ‘*the experience of a co-ordinated and smooth progression of care*’(7). Changing definitions have added to the challenge of investigating, analysing, and communicating the value of continuity, contributing to it receiving a ‘softer’ status than, for example, waiting times or quality metrics(8).

Broadly, four overlapping elements have been delineated: interpersonal or relational continuity between clinicians and patients; longitudinal continuity, occurring over time, potentially between providers and sometimes limited to particular care episodes (episodic continuity); management continuity, which may involve collaboration or proactive planning; and informational continuity, using records to communicate a shared understanding of an individual(9). Higher levels of continuity are associated with numerous benefits including improved coordination of care and fewer unnecessary secondary care episodes(10, 11), better

outcomes such as medication adherence and diabetes control(12), reduced mortality rates(13), and patient and doctor satisfaction(9, 14, 15).

For generations, continuity has formed a tacitly understood cornerstone in the relationship between general practitioners and their patients that rarely required overt acknowledgement(16, 17). However, fragmentation and destabilisation of societies and communities, combined with an increased policy emphasis on rapid access, plurality of provision, and ever-greater specialization has resulted in a reduced emphasis on continuity in UK general practice(8, 17), declining levels amongst practices(18), and claims that it is *'going out of style'*(19). More recent reports have shown greater recognition for the costs of declining continuity rates(20); however it is likely to be a challenging tide to turn.

In recent years, the complexities surrounding continuity have been exacerbated by the transformative move to digital-first approaches. Prior to the COVID-19 pandemic, remote care (telephone or video consultations or asynchronous digital care encounters) (21, 22) was still *'in its infancy'*(23), although early work looking at telephone consultations, email contacts, and text messages had concluded that they could aid continuity if deployed appropriately(16) and within the context of pre-existing relationships(24). Larger studies were underway to explore alternatives to face-to-face consultations(25), with some opinion pieces raising concerns about their impact on continuity and therapeutic relationships(23).

However, in 2020, the COVID-19 pandemic led to widespread deployment of remote care approaches(26), which have persisted (27, 28). Combined with system changes such as larger-scale collaborative working and a more multidisciplinary workforce(29), these are likely to have had significant impacts on continuity. Indeed, a recent systematic review highlighted concerns about the potential of widespread remote consulting to worsen inequities in general practice and the limited exploration to date of the quality of care and outcomes of such approaches(30).

Whilst it is possible to discretely dissect components of continuity, the complexity of interacting, contextually-specific influences and the downstream impacts relating to its presence (or absence) are harder to unpick. The experience of 'continuity of care' for patients, professionals, and wider society has an emergent value and virtue, which is far harder to define and quantify. As Tsoukas points out, by attempting to simplify the discussion around complex

subjects we lose their ‘real-world’ meaning or significance and resultant theoretical inferences are less helpful(31). We therefore set out to explore the published evidence around continuity in this new era of remote care and alongside identifying specific influences or downstream results from changes to the traditional model, also try and consider whether wider complexities are being explored, which may enable such conjunctive theorizing about the broader impacts of such alterations.

We define remote care as any encounter (synchronous/asynchronous) that does not take place in person between a patient and primary care team and include explicit references to any aspect of continuity.

Methods

Management and governance

This study was conducted as part of the ‘Remote by Default 2’ research programme (RbD2), which uses mixed methods to explore the application and complexities of practised remote care within UK general practice across a number of cross-cutting themes, including amongst others: management of long-term conditions, workforce and training, access and inequalities, continuity, infrastructure, and sustainability. Ethical approval was not required for this secondary research study; it was overseen by the independent advisory group for RBD2 which includes patient representation.

Search strategy

A keyword search of the electronic EMBASE, Medline, and CINAHL databases was conducted in January 2022 for English language studies published after 1st January 2000. The search terms related to ‘primary care’ AND ‘remote consultations’ AND ‘continuity’ (Supplementary box 1). Additional citations were sought from reference lists of selected studies and citation tracking. Duplicates were removed and the results exported and managed using Endnote X9 bibliographic software.

Inclusion and exclusion criteria

Original studies, reviews, quality improvement projects, and case studies were included from any country provided they looked at primary care, primary care physicians, or other members of the team directly linked to the main primary care provider (eg: diabetes nurses within a general practice). Studies were excluded if they focussed on non-community settings, specialist

practitioners/services or those not linked directly to the primary care provider (eg: independent community diabetes teams). Studies also had to explore some aspect of remote care (defined as above) and continuity.

Selection and data extraction

Abstracts were screened for relevance by EL (an academic GP with experience of qualitative and quantitative reviews). Full papers were then reviewed by EL and one other researcher from CR, MK, MT (clinical medical students with different levels of research experience) (Supplementary figure 1). Data were extracted using a template to organise and manage sources, but given the contextual variation, study immersion and familiarization with discussion amongst the research team was also key.

Data management and analysis

Endnote X9 software was used to manage and share data. Key themes were highlighted from individual studies with team discussion, constant comparison between studies, and a search for convergent and discordant data (data in agreement or disagreement), which allowed for development of a narrative synthesis. Rigour was strengthened by reflexivity amongst team members and the confidence of the review findings was subsequently assessed by application of the GRADE-CERQual (32) and CASP checklists (33) (international standards used to determine confidence in findings from reviews of qualitative studies). CERQual was chosen as the most appropriate assessment standard after the search revealed only one quantitative study for inclusion. Given its inclusivity, we suspect this represents a lack of quantitative assessments of continuity, rather than a bias of the search strategy itself.

Results

Description of dataset

Of 5,501 documents retrieved, 93 were selected for full text examination, with 9 contributing data. A further 83 papers were highlighted through snowballing and citation tracking and 6 were selected. The final dataset of 15 papers (Supplementary Table 1) consisted of: four interview studies with patients(34-36), four with clinicians (37-40), and one with health policy makers(41); two survey studies of clinicians(42, 43) and one of patients and clinicians(44); two mixed method studies(45, 46) and one quality improvement project report(47), all from 2018 onwards.

Confidence in findings

GRADE-CERQual analysis revealed a range of confidence levels in the review findings with the majority being of moderate confidence i.e. likely that they are reasonable representations of what they're trying to convey(48). These findings are summarised in Supplementary Tables 2, 3 and 4.

Themes

Sparsity of studies specifically reporting and measuring continuity

Of the initial 174 studies selected for full-text analysis, it was notable how few looked explicitly at continuity. The majority were rejected because it was impossible to differentiate continuity from broader concepts such as 'pre-existing relationships' between patients and their primary care teams or a doctor's 'prior knowledge' of their patients. Moreover, few differentiated between aspects of continuity. Johnsen et al. looked specifically at relational and episodic continuity(43), whilst Trabjerg et al., Hansen et al. and Tönnies et al. reported improved managerial and informational continuity with integrated primary-specialist consultations without referring to it as such eg: describing '*more coherent patient trajectory[ies]*' and '*roles and tasks [becoming] more apparent to both patients and professionals and [sharing] knowledge between health sectors*' (38, 41, 49).

Patient factors influencing continuity of care

Several studies reported the value some individuals placed on relational continuity with 'their' GP or primary care clinician(34-36). Sometimes this was because of uncertainty with less visible aspects of continuity (eg: informational) or because relational continuity itself was valued. For example, a participant with ongoing mental health problems reported her concern that '*it's quite complicated and my preferred GP knows me from day one and has worked with me and referred me and supported me, [...] I just didn't know how much this person knew*'(34). In one study, patients who valued relational continuity actively chose a telehealth appointment with their GP over an in-person consultation with a different GP (35).

Health professional factors influencing continuity of care

Some GPs emphasized the importance of consultations (remote or face-to-face) with known patients(37, 40, 42), with some indicating such knowledge was a pre-requisite for effective consultations(42). Some GPs reported how the flexibility of remote approaches could enhance

this continuity with their patients by allowing them to keep their, '*finger on the pulse much more*'(37). Johnsen et al. used a nationwide survey of Norwegian GPs to quantify the value GPs placed on relational and episodic continuity in determining the suitability of using video consultations. Both resulted in statistically significant higher suitability ratings i.e. suggesting GPs viewed remote consultations more suitable for follow-up presentations, particularly in the context of high relational continuity(43).

System factors influencing continuity of care

Some studies reported improved access to patients' usual or preferred GP with remote care approaches(34, 36), with a patient using an Australian GP telehealth model reporting that '*in fact, I'm probably seeing him [the GP] more now via the phone*'(36). However, some also reported a trade-off for patients between continuity and ease or speed of access(34, 40, 45). Quigley et al.'s independent evaluation of Babylon GP at Hand (BGPaH) - a private company offering NHS GP consultations – demonstrated that individuals choosing BGPaH (generally young with few long-term health needs) did so because of speed and ease of access, deprioritizing continuity. However some patients with complex needs were concerned about its absence eg: '*there's nothing for long-term health management*'— one BGPaH user (45).

Several studies illustrated the strategic development of remote approaches to improve relational, informational and managerial continuity within and between the healthcare system. Integrated care consultations for example, whereby the patient and GP situated together in the GP practice conducted a joint remote consultation with an oncologist, were shown to improve understanding of the roles of different specialists (e.g. cancer, mental health) in the patient's journey, resulting in a more coherent care pathway and improved managerial continuity (38, 41, 44). In two studies patients, GPs, and oncologists felt that such integrated consultations contributed to better continuity of care and thus health outcomes with all gaining a better understanding of how to optimize managerial and informational continuity(38, 44) – although such structures may be considered to be pushing the boundaries of traditional general practice activities, relating more to the primary-secondary care interface.

Furthermore, one study reported health policy experts' opinions that the relationship of trust between a GP and their patient, often formed over '*a long time*' (i.e. reflecting relational continuity) could help motivate patients to engage in remote consultations with mental health specialists(41), whilst oncologists reported how the '*long-established relationships* [between

GP and patient] could help overcome mistrust of specialists or the wider system(38). Finally, informational continuity was deployed strategically to proactively contact vulnerable patients by telephone, demonstrating the value of combining continuity and remote approaches(40).

Other studies reported patients' concerns about the implementation of remote approaches within systems eg: telephone triage or same day appointments, which could make it more difficult to access their preferred GP. This resulted in frustration, distress, harm, and increased inefficiencies(34, 35, 47). One elderly male patient with complex conditions reported an attempt to contact his preferred GP, '*...I said what was wrong and that I needed to see the Doctor. She says well Doctor [X] is not in today – phone tomorrow. Bump [phone being hung up]. So I phoned the next morning at 8 o'clock. Phones off. I phoned every five mins till 8.30am – it came on, 'surgery's now full', phone Monday. [...] It's that bad you couldn't make it up. If they had someone to report it to I'd prosecute them'*(34). Similarly, another user of an online platform reported multiple consultations because, '*I have high blood pressure. I've been trying to get in touch with the doctor to explain what I need to do [...] I've had 2 blood tests in the space of 2-3 weeks and have no idea what's going on'*(47).

The patient-doctor relationship

Many patients and health care practitioners believed that remote consultations in the context of pre-existing relationships were easier, safer, and of higher quality(34-36, 38, 42, 44, 46, 50, 51). There was a general recognition that continuity was only one aspect in such relationships, with mutual trust, respect, active listening and communication, compassion, empathy, and rapport building, all felt to be important.

Many healthcare professionals considered relational or episodic continuity essential for eliciting the subtleties in patients' concerns. Verhoeven et al. found that whilst the focus of a telephone triage may be on obvious complaints, where GPs knew patients well they could detect other aspects, '*most of the time the consultations are about a physical symptom...but when you ask a bit more you hear they are actually very worried...'*(GP respondent). '*Very worried*' might represent psychological distress or serious patient or parent concern about any complaint. Similarly, Johnsen et al. demonstrated that video consultations were deemed more suitable for follow-up consultations rather than first presentations (even when there were high levels of relational and/or episodic continuity), reflecting a concern that remote approaches

may miss information that would be obtained in-person - potentially more important in first presentations(43).

Remote approaches also affected presentation rates according to whether individuals felt their health needs were met eg: patients with mental health or chronic conditions reported missing the social cues and body language or struggling with digital systems in times of deterioration. They were concerned about their ability to form a relationship with the clinician, resulting in less satisfying/successful encounters, and reduced presentations(34, 51). In contrast, high frequency users of an online platform – again often with complex chronic or mental health conditions – perceived a lack of continuity of care, generating repeated consultations due to a perception of unmet health needs(47).

However, the BGPaH evaluation reported a high level of patient satisfaction with participants rating that their needs had been met, the clinician had listened and treated them with care and concern, and that they had confidence and trust in the clinician(45). Despite methodological concerns about recruitment bias, this suggests that relational continuity is not essential for a successful consultation; a finding supported by Imlach et al. where patients reported successful remote consultations in the absence of a pre-existing relationship and unsuccessful ones in its presence, depending on whether an effective rapport was generated(35).

Risks of the impact of remote care on continuity

Several studies highlighted the potential for remote approaches (or their implementation) to exacerbate inequities of care by reducing relational or episodic continuity for patients who value such care and in whom continuity is likely to significantly impact outcomes eg: those with complex or chronic conditions(34, 35, 39, 42, 45).

Similarly, Swedish GPs expressed concern at the trade-off between ease of access and a resultant increased workload which might impair continuity for those needing it by overwhelming the system. They described digitalization as a '*stressful time thief*', explaining that if '*health care becomes too accessible only minor ailments can be dealt with. Because health care resources are insufficient, this contact method takes resources from those who need it better*' i.e. the elderly with multimorbidity(42). Remote approaches targeting long-term conditions (eg: asynchronous blood glucose or blood pressure monitoring) could compromise

safety if the submission processes did not identify an appropriate clinician with sufficient time to deal with them(42).

Flexibility was highlighted as essential for effective implementation of remote approaches, with contrasting views as to whether patient choice or need should predominate(34, 36, 37, 39). A GP from a practice with a highly deprived population described the problems of universal, centralised, and inflexible policy decisions about technology and access, *'In terms of the technology that Matt Hancock [the UK Secretary of State for Health and Social Care at the time] seems to think is the way forward and just because him and all his peers , you know have access to all the technology, and it's very convenient for them to consult with their GP via Zoom, that is not how it is for the people where I work'*. Not only did this reduce managerial continuity but also generated barriers between the practice and the wider community(39).

Patients and clinicians also expressed clinical safety concerns with remote approaches, which could be mitigated but not eliminated through continuity. Despite high episodic and relational continuity and a large number of follow up appointments 15% of the video consultations reviewed in Johnsen et al.'s study were felt to risk missing serious illness(43) – a sentiment echoed by patients, particularly when they were unable to see their usual GP(34, 36). Moreover, continuity cannot make up for technical or contextual factors that limit remote care such as digital poverty, lack of safe spaces for consultations, or the impact of illness itself eg: mental health crises(39, 51).

Discussion

Summary

In this narrative exploration of remote approaches and continuity in primary care, just 17 of 5,582 studies met our inclusion criteria. The most notable finding was the paucity of studies looking *explicitly* at continuity distinct from the broader concept of a 'pre-existing' relationship, although many studies tacitly acknowledged the role that relational or episodic continuity played in facilitating this. Only one study specifically differentiated between components of continuity and none attempted to measure it. This may be because of the range

of possible assessment measures available, or indeed reflect the perception that continuity is a ‘soft’ measure of general practice quality rather than a potential ‘hard’ metric.

In the context of very limited published research, we have identified various factors relating to patients, healthcare professionals, the patient-professional interaction, and the wider system which appeared to influence (or were perceived by patients or professionals as influencing) the provision of different forms of continuity. Whilst we have separated the themes for clarity, many are inter-related, which we recognize – for example, system factors may constrain what professionals are able to do to influence continuity of care, which in turn may affect the patient-doctor relationship. Moreover, many of these factors are not unique to remote care approaches. Rather, they overlap and interact with wider influences on the quality of access and consultations, in particular the underpinning principles of clinical ethics and ethics of care.

Ascertaining *when* continuity really matters, for *whom*, and *how* it can best be established should be important considerations in the functional future of general practice. Studies here reveal how some patients (often with long-term or complex conditions) value relational continuity with their GP whilst others accept a trade-off for convenience or speed of access – at least when their health is stable. Similarly, some professionals particularly valued relational and episodic continuity, which could affect their attitude towards remote care – in some cases the flexibility of remote contacts actively enhanced continuity. System issues, particularly relating to triage and access, were highly significant in affecting patients’ ability to maintain relational continuity when using remote approaches and could result in frustration, distress, harm for patients, and inefficiencies. A pre-existing relationship and on-going relational continuity were considered important contributors to (but did not guarantee) a high-quality, safe, and satisfactory remote consultation. Finally, a number of potential risks were identified secondary to impacts on continuity, including worsened health inequities, increased clinical risk, and a detrimental impact on the role of general practice within communities.

Strengths and limitations

We used a structured search combined with reference snowballing to identify studies of various designs from eight countries with different primary care systems, which we assessed using multiple researchers, GRADE-CERQual and CASP, reflection and team discussions. The

narrative approach to synthesis highlighted themes to explore more deeply in the ongoing RbD2 study(52).

However, no protocol was published in advance and only one reviewer conducted the initial abstract screening. It is also important to note that our snowballing search detected more results than the search itself. This was largely because ‘continuity’ was not specifically referenced in the title or abstract thus was not detected in the initial search. On closer scrutiny and snowballing it was possible to identify more papers where continuity was included as an ‘add-on’ rather than being specifically explored per se. Moreover, the findings are further limited by the small number of studies that met the inclusion criteria – indeed many were rejected on the basis that they did not explicitly identify continuity. This lack of systematic exploration in a remote care context is an important baseline finding and emphasizes the need to continue to encourage primary care to defend important values and practices like continuity by stronger means than simply (as one sceptical editor once wrote) *‘invoking its warm, fuzzy heart, beating away in its black box, far from the close scrutiny of all but its adepts.’*(53)

Comparison with existing literature

In 2010, Freeman and Hughes identified aspects of general practice that promoted high-quality continuity, and flagged some challenges(16). In parallel to the themes here they highlighted the value many patients placed on continuity in primary care depending on their characteristics, circumstances and reason for consulting. Those with serious or chronic conditions, the elderly, vulnerable or in poor health valued it more(54), with others prioritizing quick and convenient access(55). They specifically acknowledge the importance of access processes, practice systems (eg: usual doctor lists) and task distribution (eg: long-term condition management by specialist nurses, urgent issues by acute care teams) as crucial factors in facilitating or hindering high-quality continuity. Interestingly, they note that of the six case study practices they explored, none included specific statements about continuity in their literature or websites, consistent with the tacit assumption in some studies here about its importance(16).

However, the primary studies in the 2010 review were conducted when only 12% of UK GP consultations were by phone (56) and email was sporadic(57). Whilst studies have highlighted how remote approaches can be operationalised to promote continuity eg: for follow-up or as a convenient alternative to seeing the usual GP in-person(58), the rapid, widespread use of

remote consultations brought about by COVID-19 did not allow for strategic implementation nor has there been systematic assessment of its impact. Moreover, the expansion of remote modalities has been part of a wider pandemic-driven shift towards technology-mediated care (eg: websites, national telephone advice lines, and virtual wards)(59), which is likely to have further complicated the picture.

Implications for research and practice

The COVID-19 pandemic has offered an opportunity to explore widespread use of alternative consultation approaches(60). However, it has also forced us to consider what is truly important in general practice and healthcare more widely.

In ‘adapting’ to the ‘new normal’ it will be important to assess the impacts of ongoing remote approaches whilst exploring how they may be appropriately deployed. Given the benefits of continuity, optimizing its delivery in those contexts where it is most important and valued may be considered an ‘internal good’ in the practice of medicine(61). Where continuity is desirable, its absence may contribute to moral injury, burnout, and reduced retention amongst professionals, direct harm and/or structural violence towards patients, and overall system failure. If continuity is compromised for those with complex and chronic conditions or for individuals experiencing a change in health status in order (for example) to prioritize convenience, ease, and rapidity of access for the digitally enabled, GPs risk becoming transactional specialists in minor illness and gatekeepers for siloed complaints, rather than expert generalists with a holistic oversight of an individual’s health, wellbeing, and narrative. This could undermine the health-promoting potential of person-centred, longitudinal care(62), increasing demand on overstretched healthcare systems, and eroding the social and structural support primary care offers the wider community.

Currently there is a malignant normality associated with these frameshifts(63). It is essential the counterfactuals are explicitly stated, systematically explored, and implications discussed – not just amongst academic but practitioners and patients too. Moreover, we must avoid oversimplifying. Instead, real-world explanatory frameworks that acknowledge the contextual complexity around adopting new practices should be considered. One such approach, the Planning and Evaluating Remote Consultation Services (PERCS) framework(64), combined with in-depth qualitative and ethnographic methodologies is currently being used within the RbD2 study (and an associated PhD project) to explore the contextual, technological, wider

system factors and underpinning principles that enable and support or hinder the clinical relationship that sits at the heart of any healthcare encounter. This, and similar approaches may help identify how the interacting influences on remote consultations play out *in practice* using methodologies that can capture complexity, which should allow for their optimal deployment that avoids devaluing the bedrock principles of general practice.

Conclusion

The value of continuity and importance of its position as a keystone within Primary Care has been well demonstrated. However, all too often this is implied tacitly, without being overtly stated, measured, and/or prioritized. Here we highlight a few key factors influencing continuity of care and the downstream impacts of new remote approaches. However mostly we demonstrate the currently limited evidence base exploring how the widespread uptake of remote care and wider technological innovations throughout the COVID-19 pandemic has impacted key components within our health systems like continuity. Further work must explore these implications in a real-world manner, promoting transparent discussion about the advantages and disadvantages of undermining values that add structure, meaning, and sustainability to our healthcare systems.

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Competing interests:

The authors have no relevant competing interests to declare.

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1. Donaldson MS, Vanselow NA. The nature of primary care. *J Fam Pract.* 1996;42(2):113-6.
2. (IOM) IoM. *A Manpower Policy for Primary Health Care.* Washington, D.C.: National Academy of Sciences; 1978.
3. Starfield B. *Primary Care: Balancing Health Needs, Services, and Technology.* New York: Oxford University Press; 1998.
4. Jimenez G, Matchar D, Koh GCH, Tyagi S, Van Der Kleij RMJJ, Chavannes NH, et al. Revisiting the four core functions (4Cs) of primary care: Operational definitions and complexities. *Prim Health Care Res Dev.* 2021;22:e68-e.
5. WHO. International Conference on Primary Health Care, Alma-Ata. USSR; 1978. [Available http://www.who.int/publications/ata_declaration_en.pdf Accessed 2/11/22]
6. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q.* 2005;83(3):457-502.
7. Freeman G, Hughes J. *Continuity of care and the patient experience.* Kings Fund; 2010. [Available https://www.kingsfund.org.uk/sites/default/files/field/field_document/continuity-care-patient-experience-gp-inquiry-research-paper-mar11.pdf Accessed 2/11/22]
8. Freeman GK, Olesen F, Hjortdahl P. Continuity of care: an essential element of modern general practice? *Fam Pract.* 2003;20(6):623-7.
9. Saultz JW, Albedaiwi W. Interpersonal continuity of care and patient satisfaction: a critical review. *Ann Fam Med.* 2004;2(5):445-51.
10. Ionescu-Ittu R, McCusker J, Ciampi A, Vadeboncoeur AM, Roberge D, Larouche D, et al. Continuity of primary care and emergency department utilization among elderly people. *CMAJ.* 2007;177(11):1362-8.
11. Penm J, MacKinnon NJ, Strakowski SM, Ying J, Doty MM. Minding the Gap: Factors Associated With Primary Care Coordination of Adults in 11 Countries. *Ann Fam Med.* 2017;15(2):113-9.
12. O'Connor P DJ, Rish W, et al. . Is having a regular provider of diabetes care related to intensity of control? *J Fam Pract.* 1998;47:290-7.
13. Pereira Gray DJ, Sidaway-Lee K, White E, Thorne A, Evans PH. Continuity of care with doctors-a matter of life and death? A systematic review of continuity of care and mortality. *BMJ Open.* 2018;8(6):e021161.
14. Saultz JW, Lochner J. Interpersonal continuity of care and care outcomes: a critical review. *Ann Fam Med.* 2005;3(2):159-66.
15. BMA. National survey of GPs The future of General Practice 2015.; 2015. [Available <https://www.bma.org.uk/advice-and-support/nhs-delivery-and-workforce/pressures/pressures-in-general-practice-data-analysis>. Accessed 27/9/22]
16. Freeman G, Hughes, J. *Continuity of care and the patient experience.* London: The King's Fund; 2010. [Available https://www.kingsfund.org.uk/sites/default/files/field/field_document/continuity-care-patient-experience-gp-inquiry-research-paper-mar11.pdf Accessed 2/11/22]
17. Baker R. Will the future GP remain a personal doctor? *Br J Gen Pract.* 1997;47(425):831-3.
18. Tammes P, Morris RW, Murphy M, Salisbury C. Is continuity of primary care declining in England? Practice-level longitudinal study from 2012 to 2017. *Br J Gen Pract.* 2021;71(707):e432-e40.
19. Hjortdahl P. Continuity of care--going out of style? *Br J Gen Pract.* 2001;51(470):699-700.

20. Fuller C. Next steps for integrating primary care: Fuller Stocktake report. NHSE/I; 2022. [Available: <https://www.england.nhs.uk/publication/next-steps-for-integrating-primary-care-fuller-stocktake-report/>. Accessed 27/9/22]
21. NHSE/I. Guidance and Standard Operating Procedures - General practice in the context of coronavirus (COVID-19) V2.1. NHSE/I; 2020. Available: https://www.sheffield-lmc.org.uk/website/IGP217/files/C0133-COVID-19-Primary-Care-SOP-GP-practice_V2.1_6-April.pdf. Accessed 27/9/22]
22. Newbould J, Abel G, Ball S, Corbett J, Elliott M, Exley J, et al. Evaluation of telephone first approach to demand management in English general practice: observational study. *BMJ*. 2017;358:j4197-j.
23. Atherton H, Ziebland S. What do we need to consider when planning, implementing and researching the use of alternatives to face-to-face consultations in primary healthcare? *Digit Health*. 2016;2:2055207616675559-.
24. Huxley CJ, Atherton H, Watkins JA, Griffiths F. Digital communication between clinician and patient and the impact on marginalised groups: a realist review in general practice. *Br J Gen Pract*. 2015;65(641):e813-21.
25. University of Bristol. Alt-Con project <http://www.bristol.ac.uk/primaryhealthcare/researchthemes/alt-con/> 2015 [Accessed 27/9/22]
26. Joy M, McGagh D, Jones N, Liyanage H, Sherlock J, Parimalanathan V, et al. Reorganisation of primary care for older adults during COVID-19: a cross-sectional database study in the UK. *Br J Gen Pract*. 2020;70(697):e540-e7.
27. Appointments in General Practice, March 2022. <https://digital.nhs.uk/data-and-information/publications/statistical/appointments-in-general-practice/march-2022>: NHS Digital; 2022.[Accessed 27/9/22]
28. Brant H, Atherton H, Ziebland S, McKinstry B, Campbell JL, Salisbury C. Using alternatives to face-to-face consultations: a survey of prevalence and attitudes in general practice. *Br J Gen Pract*. 2016;66(648):e460-6.
29. NHSE. A five-year framework for GP contract reform to implement The NHS Long Term Plan. 2019. [Available <https://www.england.nhs.uk/publication/gp-contract-five-year-framework/>. Accessed 27/9/22]
30. Parker RF, Figures EL, Paddison CA, Matheson JI, Blane DN, Ford JA. Inequalities in general practice remote consultations: a systematic review. *BJGP Open*. 2021;5(3).
31. Tsoukas H. Don't Simplify, Complexify: From Disjunctive to Conjunctive Theorizing in Organization and Management Studies. *J Manag Stud*. 2017;54(2).
32. Lewin S, Bohren M, Rashidian A, Munthe-Kaas H, Glenton C, Colvin CJ, et al. Applying GRADE-CERQual to qualitative evidence synthesis findings-paper 2: how to make an overall CERQual assessment of confidence and create a Summary of Qualitative Findings table. *Implement Sci*. 2018;13(Suppl 1):10.
33. CASP. Qualitative appraisal checklist for qualitative research.: Critical Appraisal Skills Programme; 2011 [Available from: <http://www.casp-uk.net/#!casp-tools-checklists/c18f8>:. Accessed 27/9/22]
34. Ball SL, Newbould J, Corbett J, Exley J, Pitchforth E, Roland M. Qualitative study of patient views on a 'telephone-first' approach in general practice in England: speaking to the GP by telephone before making face-to-face appointments. *BMJ Open*. 2018;8(12):e026197-e.
35. Imlach F, McKinlay E, Middleton L, Kennedy J, Pledger M, Russell L, et al. Telehealth consultations in general practice during a pandemic lockdown: survey and interviews on patient experiences and preferences. *BMC Fam Pract*. 2020;21(1):269-.

36. Javanparast S, Roeger L, Kwok Y, Reed RL. The experience of Australian general practice patients at high risk of poor health outcomes with telehealth during the COVID-19 pandemic: a qualitative study. *BMC Fam Pract*. 2021;22(1):69-.
37. De Guzman KR, Snoswell CL, Giles CM, Smith AC, Haydon HH. GP perceptions of telehealth services in Australia: a qualitative study. *BJGP Open*. 2022;6(1).
38. Hansen DG, Trabjerg TB, Sisler JJ, Søndergaard J, Jensen LH. Cross-sectoral communication by bringing together patient with cancer, general practitioner and oncologist in a video-based consultation: a qualitative study of oncologists' and nurse specialists' perspectives. *BMJ Open*. 2021;11(5):e043038.
39. Norman C, Wildman JM, Sowden S. COVID-19 at the deep end: A qualitative interview study of primary care staff working in the most deprived areas of England during the COVID-19 pandemic. *Int J Environ Res and Public Health*. 2021;18(16):8689.
40. Verhoeven V, Tsakitzidis G, Philips H, Van Royen P. Impact of the COVID-19 pandemic on the core functions of primary care: will the cure be worse than the disease? A qualitative interview study in Flemish GPs. *BMJ Open*. 2020;10(6):e039674.
41. Tönnies J, Oeljeklaus L, Wensing M, Hartmann M, Friederich HC, Haun MW. Health policy experts' perspectives on implementing mental health specialist video consultations in routine primary care - a qualitative interview study. *BMC Health Serv Res*. 2021;21(1):1-713.
42. Glock H, Nymberg VM, Bolmsjö BB, Holm J, Calling S, Wolff M, et al. Attitudes, barriers, and concerns regarding telemedicine among Swedish primary care physicians: A qualitative study. *Int J Gen Med* 2021;14:9237-46.
43. Johnsen TM, Lønnebakke Norberg B, Kristiansen E, Zanaboni P, Austad B, Helgetun Krogh F, et al. Suitability of video consultations during the COVID-19 pandemic lockdown: Cross-sectional survey among Norwegian general practitioners. *J Med Internet Res*. 2021;23(2):e26433-e.
44. Trabjerg TB, Jensen LH, Søndergaard J, Sisler JJ, Hansen DG. Cross-sectoral video consultations in cancer care: perspectives of cancer patients, oncologists and general practitioners. *Support Care Cancer*. 2021;29(1):107-16.
45. Quigley A HN, Aznar C, Salisbury C. . . Evaluation of Babylon GP at Hand: Final Evaluation Report. URL: <https://www.hammersmithfulhamccg.nhs.uk/media/156123/Evaluation-of-Babylon-GP-at-Hand-Final-Report.pdf> [accessed May 2022]; 2019 May.
46. Wherton J, Greenhalgh T, Shaw SE. Expanding video consultation services at pace and scale in Scotland during the COVID-19 pandemic: national mixed methods case study. *J Med Internet Res* 2021;23(10):e31374-e.
47. Leung K, Qureshi S. Managing high frequency users of an electronic consultation system in primary care: a quality improvement project. *BMJ Open Quality*. 2021;10(2):e001310.
48. Lewin S, Booth A, Glenton C, Munthe-Kaas H, Rashidian A, Wainwright M, et al. Applying GRADE-CERQual to qualitative evidence synthesis findings: introduction to the series. *Implement Sci*. 2018;13(Suppl 1):2.
49. Trabjerg TB, Jensen LH, Søndergaard J, Sisler JJ, Hansen DG. Improving continuity by bringing the cancer patient, general practitioner and oncologist together in a shared video-based consultation - Protocol for a randomised controlled trial. *BMC Fam Pract*. 2019;20(1):86-.
50. Verhoeven F, Van Gemert-Pijnen L, Dijkstra K, Nijland N, Seydel E, Stehouder M. The contribution of teleconsultation and videoconferencing to diabetes care: A systematic literature review. *J Med Internet Res*. 2007;9(5):e37-e.

51. Juan NVS, Shah P, Schlieff M, Appleton R, Nyikavaranda P, Birken M, et al. Service user experiences and views regarding telemental health during the COVID-19 pandemic: A co-produced framework analysis. *PloS one*. 2021;16(9):e0257270-e.
52. Greenhalgh T SS, Alvarez Nishio A, et al. Protocol: . Remote care as the ‘new normal’? Multi-site case study in UK general practice. (in submission MS no 13289). NIHR Open Research 2022. 2022.
53. Delamothe T. A good QOFfing whine. *BMJ*. 2008;337.
54. Nutting PA, Goodwin MA, Flocke SA, Zyzanski SJ, Stange KC. Continuity of primary care: to whom does it matter and when? *Ann Fam Med*. 2003;1(3):149-55.
55. Baker R FG, Bryan S. et al. . Continuity of Care: Patients’ and carers’ views and choices in their use of primary care services. London: National Institute for Health Research.; 2006.
56. Hippiusley-Cox J VY. Trends in Consultation Rates in General Practice 1995/1996 to 2008/2009: Analysis of the QResearch database. London: NHS Information Centre for Health and Social Care.; 2009.
57. Car J, Sheikh A. Email consultations in health care: 1--scope and effectiveness. *BMJ*. 2004;329(7463):435-8.
58. McKinsty B, Watson P, Pinnock H, Heaney D, Sheikh A. Telephone consulting in primary care: a triangulated qualitative study of patients and providers. *Br J Gen Pract*. 2009;59(563):e209-18.
59. Gkeredakis M L-AH, Barrett M. . Crisis as opportunity, disruption and exposure: exploring emergent responses to crisis through digital technology. *Inform Organ*. 2021;31(100344.).
60. Marshall M, Howe A, Howsam G, Mulholland M, Leach J. COVID-19: a danger and an opportunity for the future of general practice. *Br J Gen Pract*. 2020;70(695):270-1.
61. MacIntyre A. *After Virtue a study in moral theory*: University of Notre Dame Press; 1981.
62. Gray DP, Freeman G, Johns C, Roland M. Covid 19: a fork in the road for general practice. *BMJ*. 2020;370:m3709-m.
63. Lifton R. Malignant Normality. *Dissent*. 2017;64:166-70.
64. Greenhalgh T, Rosen R, Shaw SE, Byng R, Faulkner S, Finlay T, et al. Planning and Evaluating Remote Consultation Services: A New Conceptual Framework Incorporating Complexity and Practical Ethics. *Front Digit Health*. 2021;3:726095.