

Virtual Online Consultations: Advantages and Limitations (VOCAL). A mixed-method study at micro, meso and macro level

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Scientific summary

Background

Health services face rising costs due to increasing disease prevalence, high non-attendance rates and poor engagement by some patient groups (especially the disadvantaged and those with multiple and complex needs), resulting in poor health outcomes and greater use of emergency care. Outpatient care, particularly for people with long-term conditions, has changed little over the years and is now poorly matched to current demographics and patterns of chronic disease (for instance: rising multi-morbidity, people living longer with complications, multi-disciplinary team care). Current care models often fail to reliably provide responsive care when patients need intervention and/or support with self-care. Non-attendance leads to patients being labelled as “hard to reach” and a tendency to further disengagement. Many are then discharged from the service.

There is a strong policy push from the government to improve healthcare by utilising digital technology better and re-designing care pathways to allow the NHS to adapt to the modern world, while improving efficiency and patient self-management.

Our research on the DREAMS (Diabetes, Review, Engagement and Management via Skype) study (funded by Health Foundation), and other pilot studies indicated great potential for using video consultation services to help address the challenges facing NHS services. A handful of small randomised controlled trials (and one systematic review) have suggested that video consultations produce similar outcomes to face-to-face consultations in selected patients and conditions, and that patients find such consultations convenient and acceptable. Some studies have demonstrated cost savings. However, the published literature is likely to have been strongly influenced by selection and publication bias.

To date, little research has been done on the socio-cultural, political, technological and economic context for introducing alternatives to face-to-face consultations (macro-level), the organisational challenges of implementing a new service model based on video consultations (meso-level), or the fine-grained detail of how video consultations unfold (micro-level). Insights at all these levels are needed to inform and support the development and scaling up of virtual consultation services.

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Objectives

The aim of this study was to generate transferable new knowledge about the nature of virtual consultations and how these may be rolled out and routinised in public-sector healthcare organisations. We sought to define good practice and inform its implementation in relation to clinician-patient consultations via Skype™ (and similar media), addressing the following objectives:

1. At macro-level, to build relationships with key stakeholders nationally and identify from their perspective how to overcome policy and legal barriers to the introduction of virtual consultations as a regular service option.
2. At meso-level, to illuminate and explore the sociotechnical microsystem that supports the virtual consultations, thereby identifying how organisations can best support the introduction and sustainability of this service model in areas where it proves acceptable and effective.
3. At micro-level, to study the clinician–patient interaction in a maximum variety sample of 30-45 virtual outpatient consultations in two clinical areas. In particular, to highlight examples of good communicative practice; to identify and characterise examples of suboptimal communicative practice; and to propose approaches for minimising the latter.

Our research questions were as follows:

1. Macro-level: What is the national-level context for the introduction of virtual consultations in NHS organisations, and what measures might incentivise and make these easier?
2. Meso-level: How is a successful virtual consultation achieved in an organisation whose processes and systems are mostly oriented to more traditional consultations?
3. Micro-level: What defines ‘quality’ in a virtual consultation and what are the barriers to achieving this?

Methods

This study was designed to investigate the social and material interactions that take place between patients, staff members and technologies. We drew on strong structuration theory (SST) which proposes a dynamic and reciprocal link between the external social environment

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(political, socio-cultural, technological, regulatory and so on) and human action; it considers how the relationship between them changes over time. The SST lens guided us to investigate questions about the implementation of virtual consultation services *in situ*. This led us to design a multi-level mixed-method study of virtual consultations between patients and clinicians in three hospital departments (diabetes, Antenatal Diabetes and cancer surgery: micro-level), embedded in an organisational case study of the introduction and roll-out of this new service model (meso-level), taking account of the evolving national context (macro-level) in the period 2015 to 2017.

At the macro-level, we conducted key informant interviews with 12 national-level stakeholders combined with document analysis. The meso- and micro-level research took place in Barts Health, a large, multi-site acute trust in the east end of London, UK in which we have been working for several years to develop virtual consulting. We conducted over 300 hours of observations, combined with interviews with 24 staff and document analysis. We combined this with descriptive and demographic data from each of the clinics (for instance, the number of patients offered the virtual consultation option). At the micro-level we used audio, video and screen capture to produce rich multimodal data on 30 virtual consultations involving 27 patients and 7 clinicians from the Adult and Young Adult Diabetes clinic, the Antenatal Diabetes clinic and the Hepatobiliary and Pancreatic Cancer clinic. We supplemented this with audio recordings of 17 matched, face-to-face recordings involving 17 patients and 5 clinicians allowing us to make comparisons across face-to-face and virtual consultations. In both micro-level datasets, we sought maximum variation in clinical, social, ethnic and personal circumstances.

Macro- and meso-level analysis focused on surfacing historical and policy drivers for the introduction of virtual consultations, combined with mapping of the key interactions and interdependencies shaping implementation within the Trust. Micro-level analysis involved close examination of verbatim transcripts of the video and audio recordings of consultations, using the validated Roter Interaction Analysis System (RIAS) to code and analyse different kinds of talk. The RIAS analysis used both qualitative coding and descriptive statistics (mainly t-tests) to address five hypothesis-driven questions about the differences between virtual and face-to-face consultations for the same clinical condition: [a] are remote consultations shorter and more 'to the point' than face-to-face ones?; [b] how do they differ in the different kinds of (non-technology-related) talk that occurs?; [c] what kind of technology-related talk occurs?; [d] © Queen's Printer and Controller of HMSO 2017. This work was produced by Shaw *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This 'first look' scientific summary may be freely reproduced for the purposes of private research and study and extracts may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

what kinds of breaches (misunderstandings, 'repairs' and so on) of talk occur in virtual consultations; when do such breaches occur; to what extent do they matter; and how might they be reduced?; and [e] how do interruptions (in the patient's home and/or in the clinician's office) affect the flow of talk in the virtual consultation?

The study had a strong action research component in which data collected by and with the research team were fed back formatively to inform development of the service (for instance, where appropriate we sought to support plans for rollout of virtual consultations across the hospital). We sought patient feedback on both the research process and the virtual consultation services via a dedicated Patient Advisory Group with 12 patients (and one spouse) who met three times through the study, supplemented with ad hoc contact between meetings.

Results

At macro-level, we found that remote video consulting was viewed by policymakers with much enthusiasm as a way of delivering healthcare efficiently to a population with rising rates of chronic illness at a time of progressively worsening funding pressures on the NHS. This perspective reflected a general confidence in the potential of technology to improve the efficiency and effectiveness of service provision. Policymakers were concerned about information governance and patient safety; they anticipated that these important issues would be resolved by the development of guidance and standards. Our industry informants were cautiously enthusiastic about the technical potential for supporting virtual consultations. However, following a period of tension during and after the National Programme for IT (2005-10) they expressed concerns about the challenges of engaging either NHS England or local NHS organisations in the kind of collaborative partnership needed to evolve and embed complex technological solutions.

At meso-level, the reality of setting up and delivering the virtual consultation service in a busy NHS hospital trust (even when that trust had been a willing partner in the research proposal) was far more complex and difficult than policymakers or industry (or the research team) had anticipated. Perhaps the most significant barrier to progress was the extreme pressure on human and financial resources. Clinicians and managers in every department were under pressure; key posts were unfilled; clinics were heavily booked; and the IT department in

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particular were reluctant to commit to supporting a major new technology initiative because of severe staffing pressures. In all three clinics, the 'same' consultation when delivered virtually involved numerous and complex changes to key organisational routines (for booking the appointment, for doing and documenting the consultation itself, and for arranging follow-up). Workarounds and ad hoc solutions were often required to get the Skype™ service up and running, and extending the new model of care to other clinics took far longer than had been anticipated. Whilst some clinicians embraced the new technology with enthusiasm, others were unwilling to try it (mostly because they were "too busy").

By the end of the study, the virtual option had become business as usual in the Adult and Young Adult Diabetes Clinic but had evolved in a different way from the original plan: whilst around 4% of traditional outpatient appointments in this service were undertaken via Skype™, the main use of this technology was for supplementary clinician-initiated and/or spontaneous patient-initiated encounters (for example, as an ad hoc measure for keeping in close touch with patients who were undergoing a temporary period of instability or heightened need). Clinicians liked the ease with which vulnerable and 'hard to reach' patients could send a message via Skype™ requesting a virtual encounter, allowing prompt clinical input that (in some cases) may have averted a serious complication or hospital admission. In the Antenatal Diabetes clinic, only one clinician ever used the Skype™ service (for 2% of her encounters) and it was abandoned after a pilot period. In this (extremely busy) clinic, virtual consultations aligned poorly with a context involving multi-disciplinary teams (patients were typically consulting multiple clinicians across departments) with a relatively short term but high risk condition (gestational or pre-existing diabetes in pregnancy) and in the absence of integrated medical records (paper medical notes being held by the patient and so not physically present at the clinician end). In the Hepatobiliary and Pancreatic Cancer clinic (a tertiary referral service), virtual consultations were popular and generally unproblematic for follow-up after cancer surgery (a time when it was neither convenient nor clinically recommended for patients to make a long journey to the clinic); and the proportion of all consultations undertaken remotely rose from 7% to 20% during the course of the study. In all virtual consultation services, there were multiple technical issues to be addressed. These were often easily resolvable, but not all patients (or staff) were sufficiently skilled or confident to undertake the necessary 'troubleshooting' to achieve and maintain the video connection.

In sum, virtual consultations appeared to work best for long-term conditions in which clinician

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and patient had a pre-existing relationship with a high degree of mutual trust and 'common ground'; when interdepartmental coordination over clinical care was not required; when the need for close physical examination could be excluded in advance; when there were clinical or practical barriers to the patient traveling; when both parties were confident and competent with technical issues; and/or when there was a pressing clinical need to have repeated contacts with the patient. In the (sometimes rare) circumstances in which key clinical, technical and practical preconditions were met, video consultations appeared to be safe and popular with both patients and staff.

At the micro-level, our RIAS analyses showed that virtual consultations were, overall, slightly shorter than comparable face-to-face ones even taking account of the small amount of 'technical talk' at the beginning as the connection was established (around 3% of all talk). In both remote and face-to-face consultations, the clinician did more talking ('dominance') and exerted more control; differences in these variables between remote and face-to-face media were small and not statistically significant. Differences in the proportion of different kinds of non-technical talk that occurred were small and generally not statistically significant. One difference that was statistically (and probably also clinically) significant was that both parties sometimes needed to state things explicitly in a virtual consultation that remained implicit (and/or obvious to both parties) in a traditional face-to-face encounter. Many of these differences could be explained by material differences e.g. absence of shared artifacts such as the paper antenatal record.

We have developed significant expertise, standard operating procedures, information governance and technical guidance documents, protocols for setting up and running virtual clinics and a strong clinical, management and administrative team. The work has attracted national policy attention and interest from other hospitals. A roll-out phase continues within the trust and work is ongoing to extend the model to other trusts across the UK.

Conclusion

In the context of a strong policy push and industry interest to develop digital alternatives to the traditional consultation there are, in reality, multiple challenges to embedding virtual consultation services within routine practice in the NHS. In particular: it takes considerable

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and ongoing effort to coordinate and mutually adapt and align structures, processes and people; and inter-organisational collaboration and sharing of knowledge and practices appears to be critical to service development. Virtual consultations fundamentally change the nature of outpatient care and require clinician buy-in (which may or may not be forthcoming). If our case study is typical, NHS organisations are currently not sufficiently configured or resourced to enable and facilitate these processes.

The findings of this relatively small study suggest that even when a virtual consultation service has been established, many patients will either be unsuitable for this option or choose not to use it, so the assumption that face-to-face clinics will soon be replaced by virtual ones is probably premature. As predicted by theories of socio-technical development, the functionality of Skype™ provided opportunities for clinicians and patients to use the technology adaptively and differently, with the result that in some but not all services, the remote consultation was not simply (or not always) a video version of the face-to-face consultation. Rather, and driven by a strong clinical commitment to improving access for vulnerable groups of patients, new modes of consulting co-evolved alongside creative and adaptive use of the Skype™ technology. That the functionality of this technology enables patient-initiated contacts direct to the clinician (via Skype™ messaging) has potentially far-reaching implications.

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