

BJGP OPEN

Workload effects of online consultation implementation from a Job-Characteristics model perspective

Smart, Cordet; Newman, Craig; Hartill, Lisa; Bunce, Sian; McCormick, John

DOI: <https://doi.org/10.3399/BJGPO.2022.0024>

To access the most recent version of this article, please click the DOI URL in the line above.

Received 21 February 2022

Revised 22 September 2022

Accepted 10 November 2022

© 2022 The Author(s). This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>). Published by BJGP Open. For editorial process and policies, see: <https://bjgpopen.org/authors/bjgp-open-editorial-process-and-policies>

When citing this article please include the DOI provided above.

Author Accepted Manuscript

This is an 'author accepted manuscript': a manuscript that has been accepted for publication in BJGP Open, but which has not yet undergone subediting, typesetting, or correction. Errors discovered and corrected during this process may materially alter the content of this manuscript, and the latest published version (the Version of Record) should be used in preference to any preceding versions

Workload effects of online consultation implementation from a Job-Characteristics Model

Perspective

Cordet Smart¹, Craig Newman², Lisa Hartill², Sian Bunce³ and John McCormick⁴.

¹ Department of Psychology, University of Exeter

² UXClinician Ltd.

³ Devon STP

⁴ Devon CCG

Author Note

Cordet Smart

<https://orcid.org/0000-0002-2145-4939>

Craig Newman

<https://orcid.org/0000-0002-0525-8217>

Correspondence concerning this article should be addressed to Cordet Smart via email:
c.a.smart2@exeter.ac.uk

Authors' addresses

Dr Cordet Smart,
F08 Henry Moore Welcome Building
University of Exeter
Exeter EX4 4QG

Dr Craig Newman, and Ms Lisa Hartill
UXClinician Ltd,
Unit 4 Silverdown Office Park,
Exeter Airport Business Park,
Exeter. EX5 2UX

Sian Bunce
The Annex,
County Hall,
Exeter EX2 4DQ

Dr John McCormick:
Kingerswell Health Centre,
School Road,
Newton Abbot TQ12 5DJ.

**Workload effects of online consultation implementation from a Job-Characteristics Model
Perspective**

Abstract

Background

Online Consultation (OC) was previously promoted by the NHS to solve primary care workload challenges. Its implementation was sped up during the COVID-19 pandemic. Workload effects are widely debated. Using a job design perspective may enhance understandings of workload effect.

Aim

To qualitatively interrogate the workload experiences of primary care staff involved in OC implementation using Job Characteristics Model (JCM) enabling: clearer understanding of the primary care staff psychological experiences; and recommendations informing the design of digital implementations and continued use.

Design and setting

A qualitative interview study of GP practices using online consultation within South-West England.

Method

13 participants representing 7 practices completed JCM based semi-structured telephone interviews. An abductive theoretically driven thematic analysis was completed using NVIVO software.

Results

Participants experienced qualitatively different tasks pre and post implementation of OC, and adapted differently to this. Differences included: contact modality change, some administrative staff feeling removed from patient contact; and in perceived autonomy, some GPs valuing increased workload control. Variation in workload experience was

affected by job role, and practice context, form of and rationale for implementation. Use of a psychological model (the JCM) allowed clearer consideration of the effects of change, as well as OC on workload.

Conclusion

Psychological theory may be helpful in interpreting workload effects of technology implementation such as OC. Designing change to include consideration of: technology effects, psychological experiences, differences across roles, individuals and practice contexts may be important, for technology implementation and evaluation of its workload effects.

Keywords

primary health care, general practice, technological innovations, remote consultation, workload.

How this fits in

- Online consultation was believed to offer at least a part solution to rising workloads in GP practices.
- Online consultation has received mixed reactions from GP practices, with confusion over whether it has increased or reduced workload.
- Focusing on re-design of work when introducing digital technologies might have better effects in reducing workload and pressure.
- Using organisational psychology theory may help to predict where the difficult points might be and to improve staff wellbeing and reduce workload.

Workload effects of online consultation implementation from a Job-Characteristics Model

Perspective

Introduction

Online consultation (OC) was previously promoted as a solution to high workloads and demand on within UK primary care (1). OC encompasses multiple forms of digital consultation between a practice and a patient (webchat, online forms, text messaging, email, video consultations) (2). Its use increased over the last decade, then was mandated during the pandemic, with the impact on primary care workload being difficult to determine (3). Its continued adoption is, at the time of writing, potentially disrupted with government initiatives promoting a prioritisation of face-to-face consultation and a removal of the mandate. Nevertheless, Primary care in the UK continues to struggle with demand, with staff wellbeing and retention, major challenges and internationally (4) (5)

Views of workload impact vary depending on staff role, the location of the GP practice and perceptions of patient interest in the use of OC (1). The pandemic confounded effects, online consultation becoming a requirement to support social distancing policies (6). As the pandemic subsides there remain questions of how best to use OC within primary care and to consider its work impact (7). Internationally there have been disparities in uptake and use, with higher adoption in younger (8) and employed people prior to the pandemic but post-pandemic seeing increased use by older populations (6) (9). Concerns from clinicians are repeatedly presented around maintaining clinical quality and workload demands (9). This paper draws on the Job Characteristics Model (10), to better understand workload effects, focusing on its use within the UK.

Online consultation in the UK (OC)

A systematic search found pre-pandemic research into OC within the UK was limited, including 10 qualitative and mixed method pre-pandemic evaluation studies of pilot implementations (scoping search; Medline and CINAHL; terms: 'online consultation' and

'Primary Care') and one report (2) (up to and including September 2020). Typically, papers reported patient usage rates across 6-to-15-month periods, one-off retrospective interviews with staff, and patient surveys. Implementation facilitators reportedly included a preference by younger, female patients; barriers include increased workload fear (11) (12) (13). Job role changes and reported workload increase were major challenges for administration staff (2). No studies drew clear workload impact conclusions. Some staff were described as 'protective' over existing practice (14). Gradual change was recommended for staff and patients (2). Some staff showed less satisfaction than patients with OC, making staff an important research focus (15) (16). Several studies focused on video consultation. Hammersley et al. compared video, telephone, and face to face consultations concluding that telephone and video consults resulted in shorter, single-issue consultations (17). International studies where digital services are charged to the patient are difficult to compare with the UK. However, a US based two-year pilot study found that 40% of online consultations resulted in no in-person visit (18).

These studies included limited theory. Participant perspectives were reported at 'face value' with limited analysis of how experiences (e.g, of organisational change) were relevant. This is except for Murphy et al. who used normalisation process theory (NPT) (6). NPT frames change as requiring a series of actions – development of narrative coherence about the change, cognitive participation, a call to action and reflexive component with staff for a complex intervention to operate. Having a theory enabled these authors to contextualise quotations relevant to participants' position in the change journey (15).

Post-pandemic, as expected, OC studies increased (20 publications post Sep 2020 at time of writing). In 2020 Murphy et al. (21 practices: Bristol and North Somerset) extended the use of NPT to interpret the data, enabling understanding that some experiences were related to the context of change (6). The study suggested OC was valuable during the pandemic, but some GPs considered it unsustainable in the longer term. Congruently, a quantitative meta-analysis of OC studies modelled OC as increasing workload by up to 30% (3). Some suggest staff in these studies may not have had time to adapt to change and that context (of the practice and change) is important for meaningful interpretation (2) (15).

Using the Job Characteristics Model in Primary Care with OC

Understanding workload, like organisational change, may benefit from theory. Therefore, the Job Characteristics Model (10)(JCM, figure 1) was used here.

[Insert Figure 1 here]

The JCM proposes job design may consider skill variety (the perceived variety and complexity of skills and talents required to perform the job); task identity (the extent to which the job is seen as involving a whole, identifiable task); and significance (the extent to which the job affects the well-being of others), alongside autonomy, feedback and meaning are important for positive work outcomes (e.g. reduced turnover, increased job satisfaction) (8) (19) (20) (21). The extended JCM adds that motivation, contextual features including values and social factors are important (22) (23). Applying the JCM (24) to analyse workload may reveal aspects of staff job roles affected by organisational change (such as OC implementation). Analysing work differences, prior to, and post, change, may allow identification required adaptation, and better understanding of how to interpret perceptions of workload (23).

The JCM has been used to examine primary care administrative roles, identifying a trade-off between increased cognitive load in task variety, versus role clarity (25); and to enhance patient safety culture (26) (8). Analysing the meaning of using OC in work may provide insight into how to redesign work. For example, in GPs, some raise clinical risk as a major concern for OC, with others experiencing OC as reducing the 'messiness' of GP consultations (6) (12). Considering both factors in re-design of work, might improve experiences (thus wellbeing and performance). Burrows et al. highlights that job-design may be under-considered in primary care but may offer many benefits (25).

The JCM further enables consideration of individual staff needs. It is sometimes combined with Self-Determination Theory (SDT) to design work enhancing wellbeing (27) (28), making relevant consideration of employee autonomy, relationships and competence. Lack of

autonomy has indeed been identified as a key factor in GP retention (29), suggesting these psychological components are relevant.

This study aimed to qualitatively interrogate workload experiences of primary care staff experiencing OC implementation, using the JCM to understand how work was perceived prior to, during and post implementation. The nuances of different staff roles and different implementation approaches were also considered.

Method

Design

A qualitative semi-structured interview study using abductive thematic analysis was conducted, with interviews and analysis focused on the JCM (24).

Participants

Recruitment was during the COVID-19 pandemic between February 2021 and March 2021. Purposive sampling enabled representation of varied practice sizes, geographic areas, and Indices of Multiple Deprivation (IMD) levels and involved multiple practitioner types from across a large area (30). All administrative and clinical staff involved in using online consultation were eligible to participate. Administrative staff, practice managers and allied health professionals were a specific focus due to their relative prior underrepresentation. Thirteen participants completed an online consent to participate, with the link distributed by CCGs and the research team to practices (see table 1).

[Insert Table 1 here]

Interviews

Consent was confirmed at the beginning of the semi-structured telephone interview. Interviews were structured using the JCM, asking participants to describe the tasks, work, and relational components of their work, prior to and post implementation of online consultation and any perceived changes in meaningfulness and responsibility (see table 2).

[Insert table 2 here]

Analytic Approach

An abductive thematic analysis was conducted (31) (32) using NVivo 12. A 'bottom-up' analysis that began by identifying codes and grouping these into larger themes. There were 4 levels of coding reduction. This revealed themes that fitted the JCM, but also additional themes related to the meanings that participants experienced. After extensive coding by the first researcher, a second coder coded 20% of the data reaching 98% agreement. Differences were discussed and the JCM model was then used to examine which themes fitted with the core job characteristics in a 'top-down' analysis. This thematic was theoretically driven as the source data were responses from a theoretically (JCM) designed interview.

Credibility

Quality was assessed as assured through the following practices (33) (34):

Reflexivity

Weekly meeting of primary analysts discussing analysis and reflecting on personal reactions. Researchers discussed data sections where they felt drawn to empathise with participants, carefully reflecting on how to report these fairly.

Trustworthiness

An audit trail was maintained throughout.

Transferability

Diversity of Practice demographics and OC implementation method was intended to capture challenges and insights relevant to multiple contexts.

Relevance

Consultation with the wider research team (a senior programme manager and a senior GP partner) enabled test of relevance.

Findings

This study qualitatively interrogated the workload experiences of primary care staff involved in the implementation of online consultation, examining perceptions of change in job task, relationships and meaning, prior to, during and post implementation of online consultation. The main findings are mapped onto the JCM in figure 2. There were multiple experiences expressed by participants, and it was clear that meanings of work changed differently for people in different roles. For example, many GPs autonomy and control was important to their work, with perception of workload control increasing in a total triage system. Administrative staff, however, experienced a shift towards experienced less meaningful relationships (reduced face-to-face appointments). Differences between practices in positive experiences were related to how OC was introduced, with dual access approaches often accompanied by experienced loss of workload control. For practices already overwhelmed it was difficult to tease out effects of high demand, COVID-19 and OC implementation.

The main changes to each JCM component are discussed in turn, integrating role differences (Supplementary Table 1), and practice differences (table 3).

[Insert figure 2 here]

[Insert table 3 here]

Skill Variety

Changes in skill variety were discussed by all staff, with administrators discussing how they were now taking on more telephone work, with some feeling that they had to ask more 'clinical' questions, which was difficult. For some GPs, OC meant a greater amount of

variety in how people were accessing services, and greater flexibility in responding to patients, with a trade-off around potential overload in switching tasks (Supplementary Table 1).

Task Identity

For administrators, this was particularly challenging, as now much of the work was 'unseen' as people were directed to online resources, and decisions were made more via the technology. For GPs the ways that the task was now conducted for some created 'unsatisfying relational change'.

Task significance

Task significant was in different ways across roles. The two allied health professionals interviewed discussed role changes resulting in less 'important work' such as triaging, now done by the 'system'. Two administrators described task significance as increasing as they now asked clinical questions on telephone. Three GPs included a description of 'some older GP's' as having concerns that the work was changing away from their role as a personal friend of the family:

"a lot of my colleagues particularly I would say those older than me erm have really struggled with it because their whole way of consulting they've developed over a long time in the context of mostly seeing people face to face" [GP- H].

Workload perception

Workload was described in different ways. For example, in terms of pressure. One administrative team leader felt her team's OC role took *'the pressure off'* [AS- N] front desk administrative staff.

Four clinicians measured their workload in terms of increased numbers of 'non-significant' referrals. Others (N=8) described work as 'different'.

All the participating GPs (N=6) had previously experienced a series of much more intense face to face consultations which OC reduced. For some, managing risk when using OC was initially challenging, with some colleagues being reported as still uncomfortable with this. It was indicated by some clinicians that OC enabled more comprehensive interactions with the patient, seen as both beneficial and satisfying:

"with (OC) if you can get a decent if you can get the exact history of what's going on then I think it's really good if you can, when you reply back, you can put all these extra links in, certainly for things on phone calls which I may not always remember to do you can certainly add in lots of information" [AHP-R]

OC also increased opportunities for multidisciplinary working for some practice teams:

"we're certainly erm working more as a multidisciplinary team erm so communicating more with each other...because you get the online consult through and you have an opportunity to appraise the problem" [GP-P]

Autonomy

Autonomy was a major theme, particularly for GPs when discussing changes. People were stuck with a dilemma of experiencing feeling overloaded, particularly those from practices where the approach was an additional access route, compared with others who felt a greater amount of control over the workload (assisted by earlier triage), and able to:

"decide when to do the (OC)s." *"I can do the difficult things earlier on in the day before I'm completely exhausted and can no longer think straight."* [GP-H].

Urgent care practitioners described greater role independence, *"I think there's more, I can deal with a lot more jobs all the way through."* [AHP-M]

Feedback

Feedback was not directly asked about at interview, but participants did describe OC effects. Participants described patients as having really engaged with OC during lockdown, *“we were using it before Covid hit and it it's taken off more over the past 12 months”* [PM-N]. Staff engagement increased when staff witnessed OC being a useful,

“there was a little bit of you know, ‘why are we doing this type of thing’, which was inevitable with any change that you put in place- those things have been resolved as you started getting results” [PM-M].

Some were uncertain of their own level of sustainability due to increased pressure attributed to OC:

“... I am still as motivated but ... I'm not as motivated, 'cos it's really hard to find a resolution if I can't have extra GP time, not willing to change how we do (OC) it is quite a difficult position to be in erm where you're limited as what you can do” [PM-A]

Meaningfulness

The meaningfulness of work also appeared changed, with a change in relationships with patients being central to this. For example, for administrative staff who had less face-to-face contact with patients and began to feel more distanced,

“that was the expression that was going around basically we felt like we were working for a call centre” [AS-L] and, *“doing it that way you've lost the erm the personal touch”*. [AS-N]

GPs felt that meaning tied to patient relationships remained the same but maintaining this may require work,

“for me the meaning would be around relationships with patients and I'm hoping that hasn't changed really, that it's just working out how to keep the important bits of that.” [GP-H]

Job performance

In some practices, where OC implementation was implemented to manage local escalating demand, performance in terms of the practice prioritising and supporting patients was enhanced, as many people received an electronic response, *“I think that we're able to work much more efficiently because for a lot of those things I would be sending back some you know advice and guidance or emailing the pa- you know the patient.”* [GP-J]

However, staff felt less connection with patients, some describing it as harder to support ongoing needs for chronic patients, *“I do a lot of chronic pain work where patients have terrible pain, if they put pain as seven out of ten it says call an ambulance”* [GP-B]

Discussion

Summary

This study examined OC implementation in primary care and experienced workload effects using the JCM. Applying JCM enabled a nuanced analysis of the experienced changes. Role, practice context, and individual differences, affected how workload was experienced. In summary, significant changes were described in tasks performed and their perceived significance. This did not seem to be something that staff were prepared for. This affected the meaning of peoples work, particularly around relating to patients through technology above face-to-face contact. Role differences were significant for GPs and administrative staff. For, administrative staff experienced their new role as removed; contrastingly GPs were more concerned with clinical accuracy. Practice context was relevant, for example where a full triage model was implemented staff in this study perceived less overload following implementation than those creating dual access routes.

Comparison with existing literature

These findings reflect prior studies that OC implementation can lead to perceived workload increase, particularly for administration staff, questioning of longer-term sustainability (25) (6) (3). However, the current study adds to knowledge by identifying qualitative differences in work. Arguably, quantifications of difference may not be helpful to account for the full experience of change nor COVID-19 impact.

Application of the JCM may suggest that understanding workload outcomes benefits from a qualitative appraisal of work changes, not just a quantitative evaluation. The qualitative change that staff experienced, required staff to adapt their practice, and get used to new ways of working, likely taking up additional cognitive resources for staff who may already be under pressure. Cognitive Resources theory suggests that increased cognitive resource can be a precursor to burnout for individuals (35). Consideration of this risk when implementing OC and ongoing effects might be important at a design level. Similar difficulties have been identified for nurses post implementation of digital medical records, where the cognitive burden is initially high (35). Therefore identifying whether workload effects are a consequence of the technology or its implementation approach, is challenging.

This JCM analysis adds to the NPT approach used by Murphy et al, to understanding OC in the context of change (6). The NPT model focused on *engagement* of staff with change, through narratives, cognitive participation and doing action. It treats change as something needing leadership and staff engagement. Multiple literature supports the need for staff acceptance of technology and engagement for success in healthcare change (36) (37). This includes the importance of staff viewing the technology as 'useful' for the work being done. This JCM analysis suggests that in addition to perceptions of technology, the felt changes to daily work are important. This may have implications for development of 'narratives of change' to extend them beyond supporting the value of a technology, to encompass and prepare staff for experienced changes and re-design in the light of the technology. For example, to prepare staff for using triage in a different manner, as some of our staff did including GPs in the process, that improved the overall work experience. Thus when

designing a change implementation it may be important to plan for very specific changes in job roles.

Organisational experts repeatedly report change as complex, occurring across the organisation at multiple levels (38). Some liken it to a jazz concert, where improvisation is necessary (39). These areas of improvisation or 'chaos' might also be linked to the redefinition of new jobs and roles, which in turn could create challenges for those within organisations who may not be ready for this. They can challenge the relationship of individuals with organisations, who may perceive their psychological contract' of how to work in an organisation, has been broken, which can lead to disengagement (39). An organisational development approach with discussion opportunities around role changes and to recognise the state of flux might help people enter into 'new' roles brought on by changes such as online consultation. Such a reflective organisational approach may be more relevant for staff undergoing continuous change, such as in primary care which in the UK has been under over-demand since at least 2009 (40). The addition of the COVID-19 pandemic has heightened this, which may create a further need for job re-design.

The significance of changes in the tasks and roles of GP staff in the context of OC, can also be understood better in terms of the issues of technology change more broadly. Sandkuhl et al (37) propose that technological change needs an integrated model at a higher level, fitting the NPT approach and other recommendations in the OC literature (6). Additionally, they suggest that considering different forms of digital change is important for work design, particularly, whether technology brings new processes and work roles, whether it uses those currently available, or whether there is a merge of both (41). In OC, this may be seen through different forms of implementation – total triage, or as an additional access role. However, even with total triage, the system replaces the prior. Arguably, digital transformation can benefit from a total 'review' and may even be a re-building of Primary Care, which was reflected in a quote from the Devon Digital Accelerator programme in the UK:

'A completely new way of dealing with medicine' (42)

OC workload is important to understand for the sustainability of primary care, also retention of staff (40) (43) (44). The demands on Primary Care staff are huge (40) (43) (44). Factors known to reduce burnout include supportive team relationships, (25) autonomy, (45) meaningfulness and significance of work (46) . Within caring roles, the meaning and altruistic side of work can be more important for motivation and protection against burnout than financial gain (47). Therefore, changes to meaning, such as experienced reduction in face-to-face work and perceiving this as not enabling people to be helped, may reduce motivation. Further, there were variations in experiences of teamwork and support. Some practice managers and senior colleagues reported more challenges with engaging in team supportive activities, less face-to-face contact with colleagues and less working physically in the same space making it harder for staff to feel supported by others in the team. Others found that OC enabled more time to discuss and 'bounce off' ideas about patients, as there was time planned for managing workload. Future implementation of digital technologies might include considering enhanced staff support, to mitigate effects of job demands on burnout (48) (49).

Strengths and Limitations

The data should be treated as a small qualitative study with transferrable findings, not assuming generalisation. Recruitment was challenged by timescales, and the context of high pressure in pandemic alongside the COVID-19 pandemic. However, it was strengthened by the use of a well-researched model where links between job characteristics and performance have been previously well established (50) (51). Therefore enhancing the theoretical interpretation of the work.

Analysis was subject to the research team, which included three psychologists, one project manager and one senior GP and CCG member. Each had worked with online consultation in different professional ways. The main analysis was conducted by experienced qualitative and organisational psychologists. Data were discussed with the whole team in reflective groups, also examining researcher effects. Future research may benefit from a large quantitative study to examine job role changes post technology introduction.

The JCM was used for brevity and parsimony (10), despite being limited in that it was originally developed with blue collar workers. The current study focused on the original model as a framework to keep the interviews to a manageable length for busy GP Practice Staff. It might also be important to consider outputs in the light of the extended version developed by Humphry et al. (23). Recent studies critique its level of consideration of context and engagement (23) and this might be critically examined in future work. There are some challenges around the evidence for perceived meaning of autonomy and meaningfulness as mediators (52)(and some have suggested that work engagement might be a better mediator between job characteristics and performance (53)). However, the current study suggests that considering the meanings and 'sense making' of individuals may be important. Critiques of autonomy have been that in manual workers increasing autonomy has led to reduced performance, but in some white-collar roles might lead to higher performance. The current study suggests that autonomy was given importance by GPs, but not other staff roles, and for people in admin roles there was greater meaning placed on the opportunity to chat to patients, informally, to improve relationships. This study therefore also contributes to the JCM literature in suggesting that qualitative studies of meaning may identify more complex relationships that need to be modelled in an enhanced JCM model. They raise the question of what meaningful work is, rather than treating meaningful work as singular psychological state that people experience. Extending this focus on 'quantity' of experienced meaningfulness into its content may provide valuable insights for leaders. Through understanding what makes work meaningful for staff, they might better motivate staff to change, and / or promote their engagement in change processes such as the introduction of online consultation.

Implications for practice

- The JCM might help Practices to consider Job Design for staff.
- The JCM analysis highlighted effects of roles and work meaning on job performance and wellbeing. Reflecting on changes collaboratively may raise awareness and reduce possible experience break in psychological contract.
- In designing change, Practices should consider the:

Workload effects of Online Consultation

- unique practice context,
 - new possibilities the technology brings (new procedure vs transfer of approaches designed within different contexts (face-to-face not online)),
 - change in job design for staff
- Change design (and maintenance) should focus on enhancing opportunities for autonomy (e.g. use of OC to prioritise workload), identifying and avoiding opportunities for being 'out of control'.
 - Acknowledging as a team OC implementation as a 'system' change to manage staff expectations.
 - Careful consideration of opportunities for creating supportive and accessible teamwork experiences.

Conclusion

Workloads in UK Primary Care are reportedly greater than ever, with the role of online consultation in this, uncertain. Post its rapid implementation perspectives on the value of OC vary hugely. This study suggests that 'metrics' of workload assessment, (e.g. patient calls) may overlook the qualitative differences in workload where OC is introduced. Using the JCM provided a guide for identifying differences in roles pre and post implementation. Differences were affected by job role (e.g. GP / administrator) and Practice context. Those implementing OC, or working with it, might consider not only the process of implementation and subsequent procedures, but also overarching system design. Collaborative discussion and job re-design may help to maintain engagement and improve workload experiences.

We are grateful to those people who gave up their time to support this research project and hope that the analysis and interpretation of the interview data will have national and international value.

Funding

Devon CCG

Ethical approval

Ethical approval granted by the University of Exeter ethics department.

Competing Interests

None

Acknowledgements

We would like to say thank you to the primary care staff who gave their time to contribute to this study at a very difficult point in the COVID19 pandemic.

References

- 1 Baines R, Tredinnick-Rowe J, Jones R, Chatterjee A. Barriers and Enablers in Implementing Electronic Consultations in Primary Care: Scoping Review. *J Med Internet Res* 2020; 22(11): e19375. <https://doi.org/10.2196/19375>
- 2 Atherton H, Brant H, Ziebland S, et al. Alternatives to the face-to-face consultation in general practice: focused ethnographic case study. *Br J Gen Pract* 2018; 68(669). <https://doi.org/10.3399/bjgp18X694853>
- 3 Salisbury C, Murphy M, Duncan P. The impact of digital-first consultations on workload in general practice: modeling study. *J Med Internet Res*. 2020; 22(6): e18203. <https://doi.org/10.2196/18203>
- 4 Sansom A , Terry R, Fletcher E. Why do GPs leave direct patient care and what might help to retain them? A qualitative study of GPs in Southwest England. *BMJ Open*. 2018; 8: doi:10.1136/ bmjopen-2017-019849.
- 5 Mainous III AG. Maintaining a sufficient primary care workforce: A problem we should not have. *Front Med (Lausanne)*. 2021; 638894 . (<https://doi.org/10.3389/fmed.2020.638894>).
- 6 Murphy M, Scott LJ, Salisbury C, et al. Implementation of remote consulting in UK primary care following the COVID-19 pandemic: a mixed-methods longitudinal study. *Br J Gen Pract* 2021; 71(704). <https://doi.org/10.3399/BJGP.2020.0948>
- 7 Mold F, Cooke D, Ip A, et al. COVID-19 and beyond: virtual consultations in primary care—reflecting on the evidence base for implementation and ensuring

- reach: commentary article. *BMJ Health Care Inform.* 2021; 28(1). <https://dx.doi.org/10.1136%2Fbmjhci-2020-100256>
- 8 Bakker AB. Job crafting among health care professionals: The role of work engagement. *J Nurs Manag.* 2018; 26(3):321-31. <https://doi.org/10.1111/jonm.12551>
- 9 Mold F, Hendy J, Lai YL, de Lusignan S. Electronic consultation in primary care between providers and patients: systematic review. *JMIR Med Inform* 2019; 7(4). <https://doi.org/10.2196/13042>
- 10 Hackman JR, Oldham GR. Motivation through the design of work: Test of a theory. *Organ Behav Hum Perform* 1976; 16(2):250-79. [https://doi.org/10.1016/0030-5073\(76\)90016-7](https://doi.org/10.1016/0030-5073(76)90016-7)
- 11 Rodgers M, Raine GA, Thomas S, et al. Informing NHS policy in digital-first primary care': a rapid evidence synthesis. *Health Services and Delivery Research.* 2019: 1-54. <https://doi.org/10.3310/hsdr07410>
- 12 Cowie J, Calveley E, Bowers G, Boers J. Evaluation of a digital consultation and self-care advice tool in primary care: a multi-methods study. *Int J Environ Res Public Health* 2018; 15(5): 896. <https://doi.org/10.3390/ijerph15050896>
- 13 Edwards HB, Marques E, Hollingworth W, et al. Use of a primary care online consultation system, by whom, when and why: evaluation of a pilot observational study in 36 general practices in Southwest England. *BMJ open* 2017; 7(11). <http://dx.doi.org/10.1136/bmjopen-2017-016901>
- 14 Carter M, Fletcher E, Sansom A, et al. Feasibility, acceptability and effectiveness of an online alternative to face-to-face consultation in general practice: a mixed-methods study of webGP in six Devon practices. *BMJ open* 2018; 8(2). <http://dx.doi.org/10.1136/bmjopen-2017-018688>
- 15 Farr M, Banks J, Edwards HB, et al. Implementing online consultations in primary care: a mixed-method evaluation extending normalisation process theory through service co-production. *BMJ open.* 2018; 8(3). <http://dx.doi.org/10.1136/bmjopen-2017-019966>
- 16 Banks J, Farr M, Salisbury C, et al. Use of an electronic consultation system in primary care: a qualitative interview study. *Br J Gen Pract* 2018; 68(666): e1-e8. <https://doi.org/10.3399/bjgp17X693509>
- 17 Hammersley V, Donaghy E, Parker R, et al. Comparing the content and quality of video, telephone, and face-to-face consultations: a non-randomised, quasi-

- experimental, exploratory study in UK primary care. *Br J Gen Pract.* 2019; 69(686): e595-e604. <https://doi.org/10.3399/bjgp19X704573>
- 18 Adamson SC, Bachman JW. Pilot study of providing online care in a primary care setting. *Mayo Clin Proc.* 2010; 85(8):704-710. <https://doi.org/10.4065/mcp.2010.0145>
- 19 Tims M, Bakker AB. Job crafting: Towards a new model of individual job redesign. *SA Journal of Industrial Psychology.* 2010; 36(2): 1-9. <https://hdl.handle.net/10520/EJC89228>
- 20 Tims M, Bakker A B, Derks D. Development and validation of the job crafting scale. *J Vocat Behav.* 2012; 80(1):173-86. <https://doi.org/10.1016/j.jvb.2011.05.009>
- 21 Wrzesniewski A, Dutton JE. Crafting a job: Revisioning employees as active crafters of their work. *Academy of management review.* 2001; 26(2):179-201. <https://doi.org/10.5465/amr.2001.4378011>
- 22 Wrzesniewski A, LoBuglio N, Dutton J, Berg J (2013). Job crafting and cultivating positive meaning and identity in work. In A. B. Bakker (Ed.), *Advances in Positive Organizational Psychology* 1 (281–302). London: Emerald.
- 23 Pierce J JIA. Psychological ownership within the job design context: revision of the job design characteristics model. *Journal of Organisational Behaviour: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior.* 2009; 30: 477-496. DOI: 10.1002/job.550.
- 24 Hackman J, Oldham R. *Group & Organization Studies.* 1982 Mar; 7(1): 121-124. <https://doi.org/10.1177%2F105960118200700110>
- 25 Burrows M, Gale N, Greenfield S, Litchfield I. A quantitative assessment of the parameters of the role of receptionists in modern primary care using the work design framework. *BMC Fam Pract* 2020; 21(1). <https://doi.org/10.1186/s12875-020-01204-y>
- 26 Phipps DL, Ashcroft DM. Looking behind patient safety culture: organisational dynamics, job characteristics and the work domain. In *Patient Safety Culture.* 2018. CRC Press.
- 27 Liu Y, Wang S, Zhang J, & Li S. When and How Job Design Influences Work Motivation: A Self-Determination Theory Approach. *Psychol Rep* 2022: 125(3), 1573–1600. <https://doi.org/10.1177%2F00332941211027320>.

- 28 Ryan RM., Deci EL, Vansteenkiste M., & Soenens B. Building a science of motivated persons: Self-determination theory's empirical approach to human experience and the regulation of behavior. *Motiv Sci* 2021; 7(2), 97–110.
<https://doi.org/10.1037/mot0000194>
- 29 Owen K, Hopkins T, Shortland T, Dale J. GP retention in the UK: a worsening crisis. Findings from a cross-sectional survey. *BMJ open* 2019; 9(2).
<http://dx.doi.org/10.1136/bmjopen-2018-026048>
- 30 Public health Office of the Director of Public Health. Plymouth City Council. Index of Multiple Deprivation (IMD): Plymouth summary analysis [internet]. 2019. Available from:
<https://www.plymouth.gov.uk/sites/default/files/IMD%202019%20report%20Final%200.1.pdf>. [Accessed 11th Feb 2021.]
- 31 Braun, V Clarke, V. Conceptual and design thinking for thematic analysis. *Qual Psych* 2022; 9(1): 3-26. <https://psycnet.apa.org/doi/10.1037/qup0000196>
- 32 Miles MB HASJ. *Qualitative data analysis: a methods sourcebook*. 4th ed. London: SAGE; 2020.
- 33 O'Brien BC, Harris IB, Beckman TJ, et al. Standards for reporting qualitative research: a synthesis of recommendations. *Academic Medicine* 2014; 89(9). doi: 10.1097/ACM.0000000000000388
- 34 Braun V, ClarkeV. One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qual Res Psychol* 2021; 18:3, 328-352.
<https://doi.org/10.1080/14780887.2020.1769238>.
- 35 Colligan L, Potts HW, Finn CT, Sinkin RA. Cognitive workload changes for nurses transitioning from a legacy system with paper documentation to a commercial electronic health record. *Int J Med Inform.* 2015;84(7):469-76.<https://doi.org/10.1016/j.ijmedinf.2015.03.003>
- 36 Davis FD. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology” *MIS Quarterly*. 1989; 13(3):318-40.
<https://doi.org/10.2307/249008>
- 37 Kuek A, Hakkennes S. Healthcare staff digital literacy levels and their attitudes towards information systems. *Health Informatics J.* 2020; 26(1):592-612.
<https://doi.org/10.1177%2F1460458219839613>

- 38 Blomme RJ, Bornebroek-Te Lintelo K. Existentialism and organizational behaviour: How existentialism can contribute to complexity theory and sense-making. *Journal of Organizational Change Management*. 2012; 25(3):405-421
<https://doi.org/10.1108/09534811211228120>
- 39 Hatch MJ. Exploring the empty spaces of organizing: How improvisational jazz helps redescribe organizational structure. *Organ Stud*. 1999; 20(1):75-100.
<https://doi.org/10.1177/0170840699201004>
- 40 Hobbs FR, Bankhead C, Mukhtar T, et al. Clinical workload in UK primary care: a retrospective analysis of 100 million consultations in England, 2007–14. *Lancet*. 2016 ; 387(10035):2323-30. [https://doi.org/10.1016/S0140-6736\(16\)00620-6](https://doi.org/10.1016/S0140-6736(16)00620-6)
- 41 Sandkuhl K, Shilov N, Smirnov A. Facilitating digital transformation by multi-aspect ontologies: approach and application steps. *IFAC-PapersOnLine*. 2019; 52(13):1609-14. <https://doi.org/10.1016/j.ifacol.2019.11.430>
- 42 Devon Digital Accelerator. Interim Learning Report 2. 2020. Exeter: Devon STP.
- 43 Fisher RF, Crosson CH, Ashdown HF, Hobbs FR. GP views on strategies to cope with increasing workload: a qualitative interview study. *Br J Gen Pract* 2017 ; 67(655):e148-56. <https://doi.org/10.3399/bjgp17X688861>
- 44 Evans C, Pearce R, Greaves S, Blake H. Advanced clinical practitioners in primary care in the UK: a qualitative study of workforce transformation. *Int J Environ Res Public Health*. 2020; 17(12). <https://doi.org/10.3390/ijerph17124500>
- 45 Halcomb E, Smyth E, McInnes S. Job satisfaction and career intentions of registered nurses in primary health care: an integrative review. *BMC Fam Pract*. 2018; 19(1): 1-4. <https://doi.org/10.1186/s12875-018-0819-1>
- 46 Bremner N, Carrière J. The effects of skill variety, task significance, task identity and autonomy on occupational burnout in a hospital setting and the mediating effect of work meaningfulness. *Telfer School of Management*. 2011; 11.
- 47 Meng F, Wu J. Policy expectation moderates the relationship between merit pay policy effectiveness and public service motivation. *Social Behavior and Personality: an international journal*. 2017;45(8):1305-18. <https://doi.org/10.2224/sbp.4917>
- 48 O'Donnell CA, Jabareen H, Watt GC. Practice nurses' workload, career intentions and the impact of professional isolation: A cross-sectional survey. *BMC Nurs*. 2010; 9(1). <https://doi.org/10.1186/1472-6955-9-2>

- 49 Holland P, Tham TL, Sheehan C, Cooper B. The impact of perceived workload on nurse satisfaction with work-life balance and intention to leave the occupation. *Appl Nurs Res* 2019; 1; 49:70-6. <https://doi.org/10.1016/j.apnr.2019.06.001>
- 50 Champion MA, Mumford TV, Morgeson FP, Nahrgang JD. Work redesign: Eight obstacles and opportunities. *Human Resource Management*. 2005; 44(4):367-90. DOI: 10.1002/hrm.20080
- 51 Humphrey SE, Nahrgang JD, Morgeson FP. Integrating motivational, social, and contextual work design features: a meta-analytic summary and theoretical extension of the work design literature. *J Appl Psychol*. 2007;92(5):1332-1356. DOI: 10.1037/0021-9010.92.5.1332
- 52 Tims, M. and Bakker, A. Job design and employee engagement. *Employee Engagement in Theory and Practice*. Routledge, New York. 2014
- 53 Rai A, Maheshwari S. Exploring the mediating role of work engagement between the linkages of job characteristics with organizational engagement and job satisfaction. *Management Research Review*. 2020. <https://doi.org/10.1108/MRR-10-2019-0442>

Figure 1

The Job Characteristics Model

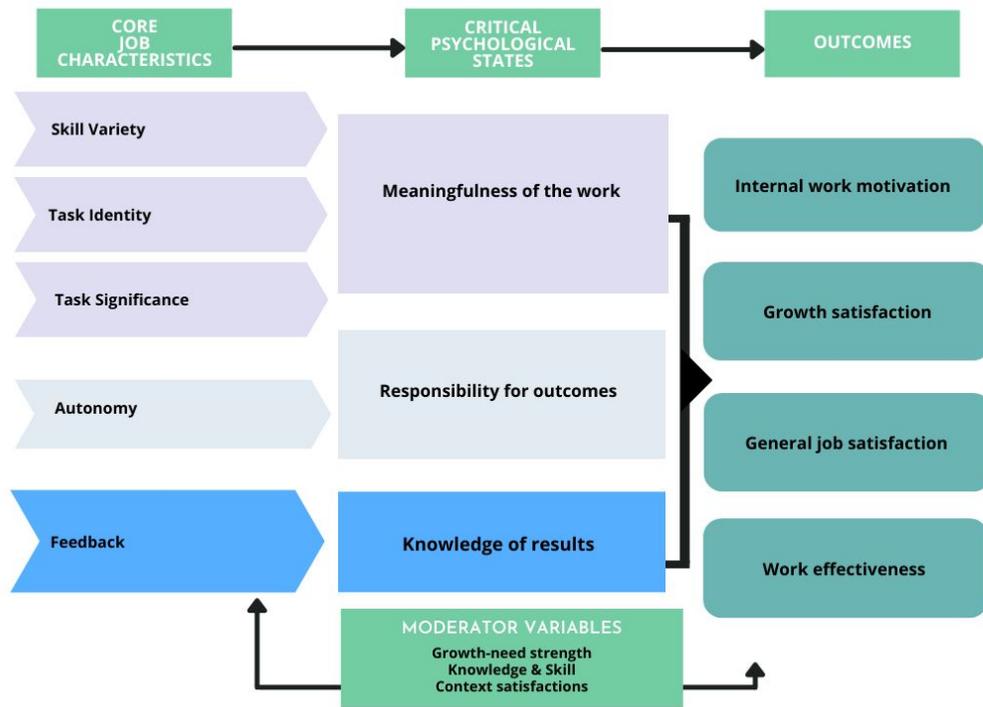


Table 1*Details of Practices and participants*

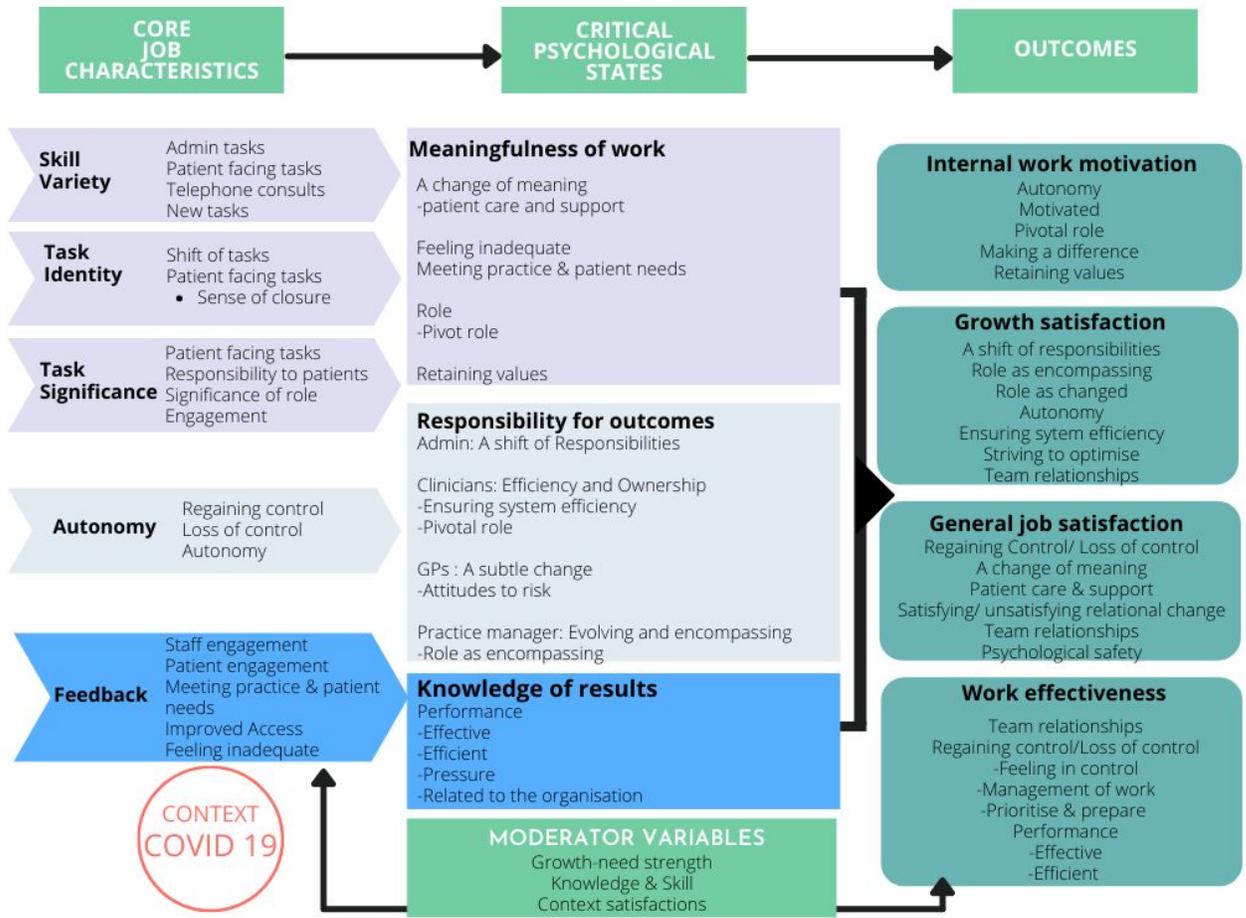
Practice	Participant	Area	List size	Role	Time in PC	Time in post	Training	Implementation Model / stage
Pseudonym	Pseudonym							
Cityside Medical	Nicola PM-N	Urban	20,000+	Practice manager	11y	11y	Management experience	Hybrid 2 years
Compass Medical	Ben GP-B	Suburban + Urban	30,000+	GP			GP training	Hybrid 3-4years
Compass Medical	Anya PM-A	Suburban + Urban	30,000+	Practice manager	9y	9y	Experience	Hybrid 3-4years
Compass Medical	Natalie AS-L	Suburban + Urban	30,000+	Admin Team Leader	16y	16y	Experience	Hybrid 3-4years
Greenfields Practice	Richard AHP-R	Suburban + Rural	30,000+	UCT	6y	6y	Paramedic	Total triage 2 years
Greenfields Practice	Jason GP-J	Suburban + Rural	40,000+	GP	9y	5y	GP	Total triage 2 years
Greenfields Practice	Hannah GP-H	Suburban + Rural	40,000+	GP	18y	7y	GP	Total triage 2 years
Greenfields Practice	Matilda GP-M	Suburban + Rural	40,000+	GP	5y	3y	GP	Total triage 2 years
Hilltop Practice	Megan AHP-M	Rural	14,000+	Urgent Care Practitioner	18m	18m	Paramedic	Total triage 1 year
Meadow Surgery	Maria PM-M	Rural	12,000	Office manager-	6m	6m	Management Experience	Hybrid 6 months+
Meadow Surgery	Lydia AS-L	Rural	12,000	Medical administrator	6y	6y	Experience	Hybrid 6 months+
Moor Avenue Surgery	Mary PM-M	Suburban + Rural	10,500	Practice manager	34y	34y	Experience	Hybrid 2 years
Seaview Practice	Paarvai GP-P	Rural	20,000+	GP	10y	3y	GP	Hybrid 1 year

Note: all practices and participants are anonymised.

Accepted Manuscript - BJGP Open - BJGPO.2022.0024

Figure 2

Findings mapped to Job characteristics model



Accepted Manuscript

0024

Table 2

Semi-structured Interview Schedule

Interview Questions	
1a	Firstly, thinking back to 'before' online consultation: Can you describe the main tasks of your role?
1b	Can you describe the relational components of your role – that is the 'talking to people' that is important but may not be captured by tasks. <i>e.g. helping colleagues, talking to patients unrelated to their medical condition</i>
1c	Can you describe the different responsibilities of the role?
2a	Since the introduction of online consultation: Can you describe any changes in the main tasks of your role?
2b	Can you describe any change to the relational components of your role – that is the 'talking to people'
2c	Can you describe any changes to the different responsibilities of your role?
3	You have identified the following changes (<i>summarise</i>) Are any of these issues linked to the change process of online consultation (setting it up/ initiating it)
4	Can you tell me which changes are likely to continue once online consultation is embedded? <i>Do you see any of these changes as ongoing once online consultation is embedded?</i>

5 Reflecting back, can you describe how the 'meaning' of your work may have changed, or not?

Prompts- has online consultation changed how it feels your work affects others (team /patients) *how work feels for you?*

6 Can you tell me how you feel that your performance at work might have changed?

7 Are there other considerations you think are important for us to understand the impact of online consultation on workload

Accepted Manuscript - BJGP Open - BJGPO.2022.0024

Table 3

Summary of differences in workload pressure experiences related to implementation model and stage

Implementation model/ Practice characteristics	Reduced workload pressure	Increased workload pressure
Total triage (3) Suburban (N=1), Rural (N=1), Urban Rural (N=1),	<ul style="list-style-type: none">• Longer implementation period led to reduced pressure• Refined triage reduced workload – e.g., involving GPs not just admin improved process.• Having the information presented prior to appointment improved GP experience of consultations.• It was possible to manage low acuity appointments online, reducing the number of face-to-face appointments.	<ul style="list-style-type: none">• Shorter implementation (6 months)• Skill of taking OC over the phone / increased use of phone OC where patients were not proficient in the system• It seemed to create more pressure for admin staff than for GPs (but there are recruitment effects).
Hybrid model (N=4) Large urban (N=1), Suburban (N=2), Rural (N=1)	<ul style="list-style-type: none">• Change in workflow around travel immunisations and medication checks meant these did not need to be checked by a GP and reduced workload.	<ul style="list-style-type: none">• Having online consultation and phonenumber access as free access routes (not triaged - not mandating triage using OC in detail, rather a more traditional approach)• Putting OC in the right place – GPs would not get the right consult, increasing pressure on admin staff.• Online consultation taking a disproportionate time of the day for admin staff, as they do not have dedicated time for it.• Felt out of control as there seemed to be no limit – running 24 hours a day.