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Published in:
BMJ Open Quality

DOI:
10.1136/bmjoq-2020-001279

Publication date:
2021

Document Version
Publisher's PDF, also known as Version of record

BMJ Open Quality

Improving access to primary care: a mixed-methods approach studying a new review appointment system in a Scottish GP practice

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To cite: Slater J, Malik S, Davey P, *et al*. Improving access to primary care: a mixed-methods approach studying a new review appointment system in a Scottish GP practice. *BMJ Open Quality* 2021;**10**:e001279. doi:10.1136/bmjoq-2020-001279

Received 22 November 2020
Accepted 22 May 2021

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ABSTRACT

A Scottish general practitioner (GP) practice proposed an improvement intervention, shorter pre-bookable 'review' appointments, to increase appointment capacity and meet their patients' demand for appointments. Staff are now able to pre-book these review appointments for patients, guaranteeing that the patient will see the same GP or advanced nurse practitioner (ANP) for both initial and review appointments. By shortening the review appointments, more patients were seen each day, hence the appointment capacity increased. The aim of this project was to examine the impact of the improvement intervention, pre-bookable review appointments, using a mixed-methods approach. Ethnographic methods (non-participant observation, participant observation and eight semistructured interviews with administrative staff) provided qualitative data, to understand the appointment system and to identify areas for further improvement. Quantitative data were then collected to assess: the number of patients receiving 'on the day' appointments, with the aim for this to be 95% (outcome measure); by how much the number of appointments available had increased (process measure) and the administrative staff workload (balancing measure). During a 7-week period, 3 months post-intervention, a median of 93% of patients received an 'on the day' appointment when they phoned for one between 08:00 and 09:00. The number of appointments available increased by 43%. Administrative staff workload (number of calls received per day) remained the same. Patients prefer being able to book in to see the same GP (continuity of care) and the ability to book in advance. Administrative staff workload decreased in terms of dealing with less frustrated patients. Main suggestions for improvement include introducing later appointments for workers and text reminders for pre-booked (review and online) appointments. The introduction of pre-bookable review appointments improved patient accessibility in the practice. Next steps for improving the appointment system include gaining clinician (GP/ANP) opinions on review appointments and trialling later appointments.

INTRODUCTION

Problem description

A Scottish general practitioner (GP) practice with a patient population of 4000 established that it was hard for their patients to get an appointment, and that their appointment capacity did not meet patient demand, much like many others across the country.[1] Previously, the only way a patient could get an appointment was to phone at 08:00 for an 'on the day' appointment or by booking online through the practice website.

A significant proportion of the practice's patients need a review appointment after their initial appointment, including: patients receiving test results; patients starting new medications and patients with acute illnesses. Previously, patients requiring a review appointment phoned the practice at 08:00 for an 'on the day' appointment. All eight GPs in the practice are part-time, making it hard for these patients to see the same GP for review appointments.

Available knowledge

In 2000, the UK government set a target that patients should receive a primary care appointment within 48 hours of requesting one.[2] Speed of access to care, ease in making appointments and convenience of appointments (being at the correct time and with a preferred clinician) are essential components to improving access to care.[3]

Other practices have found that pre-bookable (book in advance) appointments increase continuity of care, the 'continuous caring relationship' between a clinician and their patient,[4] as patients are more likely to see 'their GP' if they are able to pre-book an appointment in advance, rather than phoning for one on the day.[1] Continuity of care decreases appointment time as patients do not need to repeat their problems to different GPs on each visit.[5 6] Continuity of care is crucial for those with chronic diseases as it increases medication compliance and effectiveness of care, which decreases rates of hospital admission and the need for follow-up appointments.[5–7]

Creating different types of appointments for different patient groups, where each

type correlates to differing lengths of appointments, can increase an appointment system's efficiency and improve continuity of care.[8] Suggested groups include: emergency appointments, follow-up appointments, new patients and physical examinations.[8]

There is no mention in the wider literature of specifically allocated 'review appointments', hence it seems to be a new concept. We addressed this gap in the literature by assessing the effectiveness of this change to enable transfer of the system to other practices.

Rationale

The SEIPS (Systems Engineering Initiative for Patient Safety)[9] human factors model was used during the preliminary phase of this project to understand the appointment system in the practice by exploring the different components of the sociotechnical work system. This highlighted the components contributing to the problem, giving rationale behind the intervention.

Specific aims

The aim of this project was to establish if patient demand for appointments was being met, with a target of 95% of patients receiving an 'on the day' appointment when they phone for one between 08:00 and 09:00. A target of 95% was selected as it represented an achievable level of reliability and is associated with improved patient and service outcomes in healthcare.[10 11]

METHODS

Intervention

The intervention proposed was to include an allocated 30-minute slot per morning and afternoon session for review appointments, where GPs and advanced nurse practitioners (ANPs) would see four patients (with 7.5-minute appointments) instead of the two patients they saw in this time previously. Staff are now able to pre-book these review appointments for patients, guaranteeing they will see the same GP/ANP for both appointments. All GPs in the practice are part-time, hence it was previously hard for patients to see the same clinician for review appointments. As the clinician will already know the patient and their issues, 7.5 min was deemed sufficient length for review appointments, compared with the standard 15-minute GP/ANP appointments. This change to the system was implemented on 23 September 2019.

Context

The practice provides services to a deprived area,[12] is run by National Health Service (NHS) Tayside and all GPs work part-time—which are factors that influence the organisation of the appointment system. If any of these contextual factors were to change, the system would need reviewing to ensure the intervention was still effective.

Measures and study of the intervention

Quantitative data were collected to assess the number of patients phoning between 08:00 and 09:00 who received an 'on the day' appointment with the use of a tally sheet, with data collected every morning between 08:00 and 09:00 for a 7-week period, 3 months post-intervention. The percentage of patients receiving an appointment when they phoned for one between 08:00 and 09:00 was calculated. This information represents the outcome measure of the project—measurement of how much the system impacts patients.[13] These data were chosen to represent the outcome measure as it was easily collected and reflects patient accessibility for appointments. The target was for 95% of patients to receive an appointment when they phoned for one between 08:00 and 09:00. The outcome measure was introduced after the intervention had been implemented, hence no pre-intervention baseline data of this sort were available.

The change to the number of appointments available was measured by looking at the staff rota and the appointment system layout pre-intervention and post-intervention. The staff rota rotates on a fortnightly basis, so this was considered during the data collection. These data were used to measure clinician workload as a result of the intervention, which was the process measure for the project.

Administrative staff workload was assessed by measuring the number of calls the practice received each day 4 weeks pre-intervention and 4 weeks post-intervention, from the website 'Netcall'. The hypothesis was that the intervention would decrease administrative staff workload, in terms of the numbers of calls received between 08:00 and 09:00 each morning, due to review appointments being pre-bookable. This information acted as a balancing measure for the project—to determine whether a new problem, increased workload, arose as a result of the intervention.[13]

Analysis

A mixed-methods approach was used in this study. Ethnographic methods included interviews and observations. Forty hours of non-participant observations in the reception area provided an overview of the appointment system. Semistructured interviews with each of the eight administrative staff allowed the barriers and facilitators of the system to be explored and gave administrative staff the opportunity to suggest further improvements. All participants read the participant information sheet and signed a consent form before taking part. The interviews were transcribed verbatim and anonymised, then analysed using the NVivo V.12 software. Thematic analysis of the data was conducted using deductive and inductive approaches,[14] with the domains of the SEIPS[9] human factors model used as the inductive analysis framework. Hypotheses from the interviews and participant observation informed the design of the measures that assessed the impact of the changes, hence quantitative methods complemented the qualitative data.[14]

Five PDSA (Plan–Do–Study–Act) test cycles were conducted during this project (table 1). The PDSA cycles represent: understanding the appointment system from a GP's perspective (PDSA 1); understanding the appointment

Table 1 Project PDSA cycles 1–5

PDSA cycle	Plan	Do	Study	Act
PDSA 1	Understand appointment system in a meeting with GP.	Discussed with GP what the appointment system was like before, what changes have been made and the reasons behind the changes.	Predictions met. Change in system is introduction of shorter, pre-bookable 'review' appointments.	Find out more about day-to-day use of system (observation and interviews with admin staff).
PDSA 2	Admin staff interviews and non-participant observation of the appointment system in use.	Non-participant observation to understand how the appointment system works. Admin staff interviews to understand their opinions on the system.	Facilitators and barriers of the appointment system established, opinions on online and review pre-bookable appointments. Flow chart, cause and effect diagram and a driver diagram of the system made. Predictions met—admin staff-like review appointments.	Collect data to see if administrative staff workload has decreased as predicted, to complement the findings from interviews and observation periods.
PDSA 3	Collect data on administrative staff workload. Predictions were that workload had decreased.	Data collected on number of calls received by the practice between 08:00 and 09:00 4 weeks pre-intervention and 4 weeks post-intervention (23 Sep 2019) using the website 'Netcall'.	Prediction not met —number of calls remained the same pre-intervention and post-intervention. Wilcoxon and Mann-Whitney tests conducted to determine statistical significance of result. Monday was busiest day. Run chart created.	Collect post-intervention data on whether patient demand for appointments is being met or not. Collect pre-intervention and post-intervention data about clinician workload.
PDSA 4	Collect data to determine whether the intervention met patient demand for appointments. Prediction was that patient demand is being met.	Data collected on the percentage (%) of patients phoning between 08:00 and 09:00 who receive an 'on the day' appointment.	Predictions met—patient demand is close to the target with 93% of patients receiving an appointment when they phone for one between 08:00 and 09:00.	Collect pre-intervention and post-intervention data about clinician workload.
PDSA 5	Collect data on clinician workload pre-intervention and post-intervention. Prediction was that there was an increase in number of GP/ANP appointments available.	Data collected on the number of appointments available per day pre-intervention and post-intervention, and the weekly staff rota of the GPs and ANPs in the practice.	Predictions met—there was a 43% increase in the number of GP/ANP appointments available in the practice.	Collect data on the clinicians' opinions on the intervention, including the increased number of GP/ANP appointments available and shorter consultation time for review appointments.

ANP, advanced nurse practitioner; GP, general practitioner.

system from the administrative staff's perspective (PDSA 2); comparing administrative staff workload pre-intervention and post-intervention (PDSA 3); assessing whether the intervention meets patient demand for appointments (PDSA 4); and comparing clinician workload pre-intervention and post-intervention (PDSA 5).

RESULTS

Interview results

The new appointment system in the practice is favoured by the administrative staff in comparison with previous systems (box 1). They also believe that patients prefer the system.

Factors that contribute to the positive opinions include: the usability of the system; the queueing system for patients phoning in; pre-bookable review appointments; online pre-bookable appointments and the change to 'duty doctor' slots. The implementation of review appointments increased continuity of care, increased the number of patients able to be seen and decreased the number of frustrated patients the administrative staff deal with. Patients also prefer being able to book in advance and to be able to see the same GP/ANP.

Barriers to the system, as identified by administrative staff, include: the lack of later appointments for patients who work; the timings of emergency appointments; the

Box 1 Quotes from administrative staff interviews.

- Administrative staff opinions on the appointment system:

'The new system is way better than it was before, definitely.'
'I'm biting my tongue every time I say this, but [GP]'s made some really good improvements to it [the appointment system].'

- Administrative staff perceptions of patient opinions on the appointment system:

'Yeah, often they're [patients are] making comments about that. "It's great that I can see a doctor" and "It's great that I can see the same doctor".'
'They [patients] do say "oh it's much better now, you can get an appointment much easier". Because before it was just complaints all the time about that [the appointment system]—but I've not heard that for a long time, so it's definitely better.'
GP, general practitioner.

increased rate of DNAs ('did not attend') associated with appointments that are pre-booked (online and review); and the inability of some patients to phone at 08:00 for an appointment. Suggestions for further improvements hence include introducing later appointments (for example at 17:00) for working patients, and text reminders for pre-booked (review and online) appointments.

Patient accessibility (outcome measure)

During a 7-week period, 3 months after the introduction of the new system, the median percentage of patients receiving 'on the day' appointments when they phoned for one between 08:00 and 09:00 was 93% (figure 1), almost meeting the target of 95%. During weeks 6 and 7 of the data collection, there was an improvement in reliability with six data points located above the median, as highlighted by the circle in figure 1. In this group of data, one data point was on the median, so was disregarded as by run chart rules,[15] however one data point (93.1%) was slightly below the median of 93.3%—hence this is technically not a shift in the data. This 'near shift' shows how the system has become more reliable over time, with the percentage of patients receiving appointments being around the target of 95% by the end of the 7-week data collection period. Patients who did not get an appointment include: those who phoned for an appointment but the lines were busy ('abandoned' calls); when there

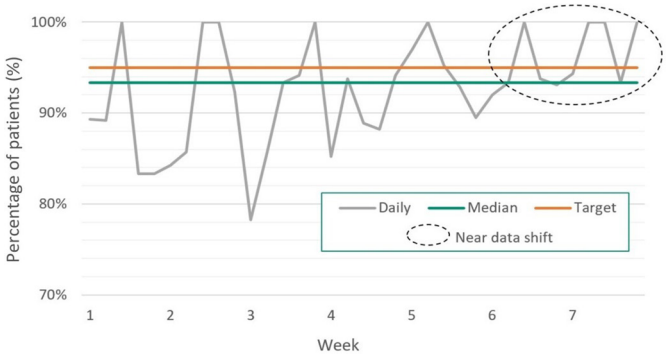

Figure 1 Percentage of patients phoning and getting an appointment each weekday post-intervention.

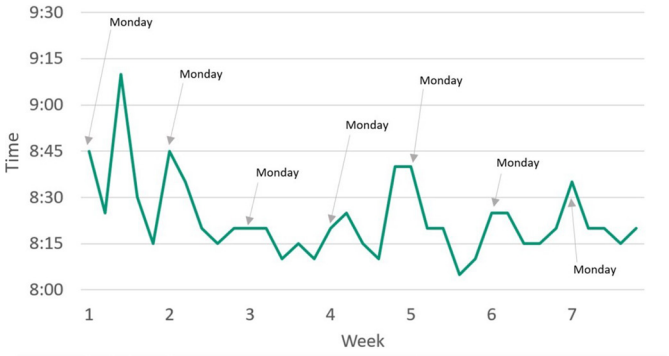

Figure 2 The time in which the phones went 'quiet' each weekday.

were no appointments left to offer the patient; or when there were still appointments available, but the patient declined the appointment.

The number of patients failing to receive an appointment on Mondays was higher (average of 3.3) than the rest of the week (average of 1.4 Tuesday–Friday). The phones went 'quiet' (when there was no longer a queue of patients waiting to be spoken to, as reported by administrative staff) latest on Mondays in 5 of the 7 weeks (not in week 1 or week 4), implying that demand for appointments was highest on this day (figure 2).

Number of appointments (process measure)

There was a 43% increase in the number of appointments available, from 554 to 792 appointments available per 2-week period, in September 2019 (process measure). This increase in the number of appointments available was mainly due to the intervention (pre-bookable review appointments) however, there was also a change to the allocation of 'duty doctor' slots at this time which also contributed to the increase.

Administrative staff workload (balancing measure)

The number of phone calls the administrative team received each weekday (balancing measure assessing administrative staff workload), remained the same pre-intervention and post-intervention (Wilcoxon test, p=0.20). More calls were received on Mondays compared with Tuesday–Fridays (Mann-Whitney test, z=2.03, p=0.042), hence demand for appointments was likely highest on Mondays.

DISCUSSION

Summary

Interviews found that the current appointment system is favoured by administrative staff, however areas for improvement include introducing later appointments for patients who work and text reminders to decrease the DNA rates in pre-booked appointments. The use of review appointments in the practice did not alter the total number of phone calls received each weekday. After the intervention, there was a 43% increase in the number of appointments available. Subsequently, this freed up

clinicians' time and decreased the number of patients not getting an appointment, as well as organising the clinicians' time in a more systematic way. Proposed use of this freed-up time includes: allowing longer consultations for patients with complex care needs and for the practice to offer contraceptive services, as patients currently need to go to secondary care for this. Finally, patient demand for appointments was highest on Mondays.

Interpretation

Key recommendations for further work stemmed from the interviews. These include introducing later appointments for workers and introducing text reminders for pre-booked (review and online) appointments to decrease DNA rates. Another suggestion was to rearrange the appointment system layout to have pre-booked appointments before 'on the day' appointments, to allow patients phoning at 08:00 for 'on the day' appointments more flexibility.

If more appointments were to be introduced, they would be of most use on Mondays. On average, 3.3 patients were not getting an appointment when they phoned between 08:00 and 09:00 on Mondays, compared with an average of 1.4 on Tuesdays–Fridays. If two more appointments were available on Mondays, this would allow the practices availability of appointments to meet patient demand to a similar degree on each day of the week.

While lessons from this work can be drawn widely by other practices, the entire system cannot be copied as this system has been adapted to meet the demands of the population the practice serves. Due to the importance of context within the success of improvement work,[16] other practices should acknowledge two unique factors of this practice, if they wish to trial a similar system—the demographics of the area and that all GPs in the practice work part-time. If the context were to change within the health centre, for example, an increase in full-time GPs, then the intervention should be reviewed.[16] The implementation of pre-bookable review appointments encouraged continuity of care in this practice, which was previously difficult to maintain due to the reduced working hours of each of the part-time GPs.

Relationship to wider literature

'Grouping' patients and varying appointment length depending on the needs of each patient are some things recommended by Huang,[8] giving rationale to the introduction of shorter pre-bookable review appointments in this practice. Time is saved if patients are seeing the same clinician for review appointments (continuity of care), which decreases clinician workload and allows review appointments to be shorter.[17] By 2030, it is recommended that all practices should offer 15-minute appointments as standard—which is already the case in this practice.[18] An American practice found that they had higher demand on Mondays and Tuesdays (similar to the findings of this study), and they introduced evening appointments on those days of the week to meet the higher patient demand, hence altering the availability of appointments to accommodate daily variation could be considered.[6]

Limitations

When collecting data on the number of calls received by the practice each weekday (balancing measure), it would have been ideal to only include calls between 08:00 and 09:00, however this was not feasible as the software used only recorded a total for each day. Other limitations include public holidays being included, and that no other measure of administrative staff workload was collected (for example, dealing with less frustrated patients).

There were two changes to the appointment system in September 2019. Shorter pre-bookable review appointments were implemented (7.5-minute appointments instead of 15-minute appointments), and 'duty doctor' slots were spread out among all clinicians (GPs/ANPs) instead of just one. 'Duty doctor' slots involve GP tasks that do not involve a physical appointment—such as a medication review, or a telephone call back to a patient. The change to the 'duty doctor' slots did not alter the number of appointments available greatly, but did contribute to the 43% increase in the number of appointments (process measure), hence is a limitation of the data collected.

No clinician (GP/ANP) or patient opinions were gained due to the limited period of data collection, hence this is another limitation of the study. Collecting data on the GPs/ANPs' opinions about review appointments, and about the appointment system in general, is a crucial next step. Key questions to be asked include the clinicians' opinion on the length of review appointments, and whether they thought review appointments were being booked for the correct type of patients.

Additional limitations include: the presence of the researcher during observation periods (Hawthorne effect)[19] ; the limited period of data collection; little pre-intervention data being gathered and that only one researcher collected the data, which may have resulted in unintentional bias.

CONCLUSIONS

Importance of project and next steps

This project was important for the practice as it evaluated the recent change to their appointment system. The implementation of review appointments has improved patient accessibility and increased the efficiency of the practice's appointment system. Clinician opinions on the system were not gained during this study, hence acquiring these is the next step in understanding the system fully. Further next steps include trialling the suggestions given in the interviews, such as introducing later appointments for workers and text reminders for all pre-booked (online and review) appointments. The lead GP in the practice, who designed the intervention, will be responsible for carrying out further work to the appointment system in line with the results of this study.

Transferability of results

This project was a bespoke, local improvement project developed by the clinical staff in one GP practice. While lessons from this work can be drawn widely by other practices, the entire system cannot be copied as this system has been adapted to meet the demands of the population that the practice serves. Practices should acknowledge contextual factors of the practice, as discussed above, if this appointment system were to be replicated. The implementation of pre-bookable review appointments encouraged continuity of care in this practice, which was previously difficult to maintain due to the reduced working hours of each of the part-time GPs.

Due to the small-scale nature of this project, a more thorough analysis of pre-bookable review appointments at a regional or national scale would be beneficial in allowing other practices to implement the system, as national policies on appointment systems are currently not in place. There is also scope for the system to be implemented beyond the primary care field, into the secondary care sector.

Acknowledgements We would like to thank all staff at the practice for their contributions to the data collection. Thanks also to Peter Davey and Evridiki Fioratou for running the Healthcare Improvement BMSc at the University of Dundee.

Contributors JS designed the project, carried out all data collection and wrote the paper. SM identified the issue in the practice and designed the intervention to address this. SM also supported all data collection in the practice. PD was the academic supervisor who helped design the project and edited drafts of the paper. SG helped design the data collection process and supervised the analysis and interpretation of the data collected. SM, PD and SG all commented on drafts and approved the final version to be published.

Funding This work was completed as part of a BMSc in Healthcare Improvement at the University of Dundee.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval The project was considered quality improvement work, hence the project protocol was submitted to the practice Clinical Governance Committee for approval. Due to the limited time available, patient interviews were not included as a method of data collection, as this would have required approval by a research ethics committee. There were no conflicts of interest.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data is available upon request.

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