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General practitioners' perceptions towards use of digital health services for citizens in primary care: a qualitative interview study

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General practitioners' perceptions towards use of digital health services for citizens in primary care: a qualitative interview study

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Abstract

Objectives

To explore GPs' perceptions towards use of digital health services for citizens.

Design

A qualitative study based on semi-structured interviews.

Setting

Primary Care

Participants

Nine GPs from that were early adopters of the four services were interviewed.

Method

One moderator presented topics using open-ended questions, facilitated the discussion and followed up with further questions. Phone interviews were conducted, audio recorded and transcribed verbatim. Qualitative data were analysed using the Framework Method.

Results

The use of digital services in primary care in Norway is growing, though use of text-based e-consultations is still limited. Most GPs were positive to all four services, but there was still some scepticism regarding the effects. Advantages for GP offices included reduced phone load, increased efficiency, released time for medical assessments, less crowded waiting rooms and more precise communication. Benefits for patients were increased flexibility and autonomy, time and money savings. Children, elderly and people with low computer literacy might still need traditional alternatives.

Conclusions

More defined and standardized routines, as well as more evidence of the effects, are necessary for large-scale adoption.

Strengths and limitations of this study

Strengths:

- The study investigates technology implementation in general practice.
- Rigorous application of qualitative framework theory.

- The results sheds light upon themes that are relevant for clinicians and policy makers.

Limitations:

- All GPs that participated in the study were voluntary early adopters, and thus possibly more positive and competent with technology than the general GP population.

Introduction

The general practitioners' (GP) scheme is a central component in the Norwegian primary health care system. All GPs participating in this study are included in the GP scheme, meaning that they are private practitioners who have established a contractual agreement with the municipality in which their practice serves the population. Primary health services in Norway are financed through a variety of grants and reimbursements from the public sector, and out-of-pocket payments (1). In an effort to provide the citizens with a uniform portal for communicating with their GP, the Norwegian Directorate for e-health has developed the «Digital dialogue with the general practitioner», a suite of four online services. By July 2018, these services were offered by 186 GP offices, which were part of the public GP scheme (4732 GPs working in 1542 offices), in order to obtain user experiences before large-scale deployment. The four digital services are accessible to citizens from the private section of the national portal helsenorge.no. They are available after login and include:

1: an electronic booking service to make reservations with the GP

2: an electronic prescription service to request renewal of maintenance drugs, with direct integration with the electronic prescription system of pharmacies

3: a service for text-based non-clinical enquiries to the GP office (e.g. opening hours, results from diagnostic tests) 4: a service for electronic consultation (e-consultation) with the GP.

The first three services are mainly administrative, geared towards introducing less time-consuming routines for both GP offices and patients, and free of charge for patients. E-consultation is a clinical service, which requires patients to pay the same out-of-pocket fee as for office visits. GPs are free to offer to patients all the four services or only some of them. The portion of the population with Internet access in Norway is very high, and almost total in the younger part of the population (2). It is therefore possible to assume that these electronic services have a large potential user base.

Being the only clinical service in the suite, the e-consultation service warrants a more detailed introduction. The service at offer in the present study conforms to the definition that e-consultation is an asynchronous, non-face-to-face consultation using a secure electronic communication platform (3), where the doctor answers clinical questions in a similar way to a standard consultation and answers are send electronically (4). The demand for services that enable digitally based communication between the patients and their GPs is not new, and has been around since the early days of the Internet (5). While the use of online services in health care is on the rise, it is unclear whether it is beneficiary to all socioeconomic segments of the population (6). E-consultations in primary care have been mostly used to increase access to specialist care (7-10). However, the proliferation of e-consultations and other digital health services used by citizens to communicate directly with their GPs are limited, and consequently the body of literature from which to draw direct comparisons is narrow.

The presented suite of digital health services for citizens has the potential to improve the accessibility and efficiency of primary health care. However, government and vendors have been criticized for being overly optimistic about the expected favourable outcomes from employing health informatics (11). In order to release some of the potential of health informatics systems, it has been argued that, among others, feature functionality, project management and user-related outcomes affect implementation outcomes (12). The aim of the present study was to explore GPs' perceptions towards use of digital health services for citizens in primary care. Three main research questions were addressed: 1) which routines were implemented by GPs who adopted digital health services for citizens? 2) Which were GPs' impressions on benefits and disadvantages of digital health services for citizens? 3) How did GPs use digital health services for citizens?

Methods

Patient and Public involvement

The present study did not have patient involvement. The study did not require approval from the regional ethics committee (REK). All participants were voluntary medical professionals (GP). The results will be distributed to the study participants via e-mail mailing lists that includes both study participants and other GP that did use the four services.

Data collection

We conducted semi-structured interviews with GPs who adopted at least one of the four digital services. Some GPs adopted the services since their early introduction in 2015, some started using the services in 2016 while others adopted them only a few months before the present study was conducted. Interviews were conducted until data saturation was reached (13) for the main analytical categories.

A semi-structured interview guide was used to illustrate GPs perceptions towards use of digital health services for citizens. The interview guide was developed with a number of questions for each of the four digital health services, as well as with a few questions of more general nature. Some questions were previously tested in a pilot qualitative study on the use of e-consultations. Consequently, the content of the interview guide was modified to include the feedback collected during the pilot study.

One moderator (AJF) who did not have any relationship with the interviewees beforehand conducted the interviews. The moderator presented topics using the open-ended questions in the interview guide, facilitated the discussion and followed up with further questions. The interviewees could discuss freely about their experiences. The moderator also sought to summarise discussions around each topic to verify interpretations of the GPs answers. The interviews were conducted by phone due to long distances to GPs offices. Interviews were audio recorded and transcribed verbatim in Norwegian. Quotes relevant for this paper were translated into English.

Data analysis

Data were analysed by a multidisciplinary research team consisting of three members (AJF, IMH, PZ) with background in psychology, social science and health technology. Qualitative data collected from the interviews were analysed using the Framework Method (14). After transcription of the audio recordings, a sample of two interviews were randomly selected to let the research team familiarise with the transcripts and develop initial impressions and potential ideas for codes. Transcripts were then thoroughly read and independently analysed by each member of the research team. Interesting segments of text were underlined and notes were made in the margins of the transcripts to describe the content of each passage with coding labels as well as with more detailed information supporting the interpretation of the results. The members of the research team later met to share the coding labels, which they had assigned to the two transcripts. Each passage was analysed to discuss why it was interpreted as meaningful and how it could be useful to address the research questions. The coding labels used to describe each passage were compared to find similarities in the interpretations of the content and to resolve

differences. Finally, a working analytical framework was developed around a set of codes explained by a short definition.

The remaining seven transcripts were then assigned to the three members of the research team and analysed using the analytical framework. New codes that were not included in the initial framework were assigned together with the already defined codes as additional impressions emerged. Regular team meetings were conducted during the process of analysing transcripts to discuss new codes, group together codes which were conceptually related and refine the initial analytical framework. The analytical framework was refined until no new codes were generated. The final analytical framework [**Table 1**] consisted of fifteen codes grouped into five categories, each including a brief explanatory description of their meaning.

The final analytical framework was applied to all the transcripts by assigning appropriate codes to each meaningful passage of text. Data were then summarised in a framework matrix using Microsoft Excel. The framework matrix consisted of one column per interviewee, and one row per code. A separate sheet was used for each of the four digital health services explored in this study. Data from transcripts were summarised using verbatim words and inserted into the corresponding cell in the framework matrix. The qualitative data included in the framework matrix were finally reviewed to make connections across interviewees and categories, identify common themes as well as individual differences (15). Results were summarised and presented separately for each of the four digital health services.

Table 1. Framework matrix.

Use	
Extent of use	The extent to which the service is used by the staff
Inappropriate use	When the service is not used correctly
Suitable for	Situations for which the service is most useful
Unsuitable for	Situations for which the service cannot be used
Motivation and incentives	Factors affecting users' motivation to use the service
Routines	
Doctor's office	How the office is organized around the service
General practitioners and staff	How the service is integrated into individual routines
Advantages	
Doctor's office	The main benefits for the staff of the doctor's office
Patients	The main benefits for the patients
Disadvantages	
Criticisms and potential improvements	Organizational problems regarding the service delivery
Technical challenges and limitations	Technical problems regarding the service functionality
Time and efficiency	Impact of the service on the staff's productivity
Economics	Economic impact of the service
Other issues	
Perceptions	Individual thoughts around the service
Written communication	Impact on the communication with patients

Results

Nine GPs from different offices were interviewed in the period from September 2017 to November 2017. Each interview lasted from 30 to 60 minutes.

Electronic booking

The amount of appointments available for electronic booking (e-booking) varied among practices. One GP office started with having all time slots open for e-booking. However, after a testing period, their practice was modified by maintaining some time slots not available for e-booking to have more flexibility for patients booking in person or by phone. Other GP offices decided to restrict specific time slots to meetings or administrative work. One GP office did not yet adopt e-booking due to limitations in managing different lists of patients for GPs of the same practice. The demand for e-booking was especially high among technology-oriented patients.

> «[…] sometimes there are time slots available for regular appointments, but not for e-booking»

The extent to which e-booking was available also varied among GP offices. Some GPs published all time slots six months in advance, while others only one month ahead. Requests for emergency appointments were generally not available through the service.

Despite different routines, GPs agreed that e-booking had obvious benefits and perceived the service as effective and timesaving. Reduced phone load was emphasised as a significant gain. One GP office recorded a 25% drop in incoming calls. Consequently, the staff obtained more time available to other important tasks. Reduced phone load brought also benefits to less technology-oriented patients who prefer regular phone-booking. According to the GPs, patients considered e-booking useful and preferable to regular booking, mainly due to timesavings. Patients were also less dependent on GP offices' opening hours. Patients with a tight schedule experienced increased autonomy as they could easier book online an appointment fitting their schedule. GPs mentioned only a few disadvantages. Experience showed that e-booking was not suitable for everyone. Children, elderly, people not familiar with technology as well as some patients receiving psychiatric care were examples of patients who might require traditional booking alternatives. Moreover, GPs had less information on patient's reasons for requesting an appointment when the booking was made electronically.

GPs were generally satisfied about using e-booking for regular appointments, and were positive about the potential use for emergency appointments.

«Doctors are generally sceptical about making emergency appointments available for e-booking, but we actually have a good experience with this. The service is seldom used improperly».

The users of e-booking pointed out a number of limitations. For instance, when GPs made changes, these were not updated and visible until the next day. Another drawback was the impossibility to filter unnecessary appointments in the same way as by phone, or modify the required time for appointments. One GP highlighted some challenges in using same day appointments, available for booking from 4 PM the day before.

«It takes time for patients to understand this, so when looking for a time slot two days in advance, they do not find it. Then they try to book an appointment at another doctor, despite there will be many time slots available at their doctor. But we have always been concerned with explaining concepts and educating citizens in how to do this».

Improper use rarely occurred. When using e-booking, most patients generally booked single appointments, even if they might need a double appointment. GPs found it easier to clarify such matters by regular phone booking and missed the possibility for e-booking of double appointments. Another challenge mentioned was the inappropriate request for vaccination.

Electronic prescription renewal

GPs adopted different procedures to handle electronic prescription (e-prescription) renewals. Some GP practices made new requests available in a common inbox that was checked daily, thus ensuring that renewals were processed even if the responsible GP was absent. One GP preferred to process all e-prescriptions by himself, while another interviewee delegated them to a medical secretary, except for cases of doubt. GPs processed requests between consultations or at the end of the day, sometimes requiring overtime work.

«In the way the GP scheme has been evolving, we may have ended up with more work in the evening».

GPs mentioned a number of benefits of e-prescription, including fewer incoming calls, increased efficiency in administration and consequent released time for medical assessments, less pressure in the waiting room and in the GP office, improved dispatching priority and more precise communication.

«Fewer phone calls is probably the main advantage in addition to less hassle in notifying that a prescription is ready, for instance».

Obvious advantages for patients were, according to GPs, time and money savings since they did not have to show up at the GP office to renew a prescription. However, one GP thought that it could become too easy to renew a prescription for patients who should have had a control visit. The service could potentially involve additional work for GPs if they need to explain patients why a renewal was refused, access their journal and look up former use of medication, or receive many prescription requests at the same time. Another GP thought that the interface was slow.

«The number of clicks and processes was somewhat easier - a bit easier than (the previously used) SMS-service. However, if you look at the doctor's work with managing the service in relation to attending patients, we use more time.»

The service was best suited to renewals for chronic patients on complex medications schemes.

«E-prescribing […] provides a much more complete overview of when patients took their medicine. This makes it easier for other doctors in the system to follow up».

Some GPs believed the service could be an effective solution for "simple" infections, frequently prescribed medications such as benzodiazepine and sporadic medications such as painkillers and allergy medications. The GPs were somewhat divided regarding the prescription of potentially addictive medication.

«Ideally, addictive medications of benzodiazepine should not be renewed like this, but it depends on each situation».

However, other GPs held a different position regarding medications used for long-term treatment.

«Frequently prescribed medications taken daily for chronic diseases are renewed once every year at a yearly control. There we can see […] if there is anything to change […]. Renewal by electronic prescription removes the possibility for adjustment. […] it is best suited for those medications that are easy for people to keep control of and understand when they should consult their doctor if there is something that does not work well, such as recurrent urinary tract infections».

E-consultation

The service was only used to a limited extent by the patients. GPs reported up to twice e-consultations per day, which occurred in the form of a dialogue between patient and GP. E-consultations were used for remote follow-up of health problems previously discussed during in-visits. Through an e-consultation, a GP could adjust a treatment, prescribe referrals or provide information. GPs could also assess, for example, signs of eczema upon receiving pictures electronically.

«It should be a known problem, of medical nature, and regarding a known patient»

GPs were in general satisfied about how much could be done without an office visit.

«Far better than I thought, depending on how well the patient describes the problem [...] Perhaps 20-30% of the situations require personal attendance»

There were, however, cases in which e-consultations could not be used. These included newly emerged clinical problems, which could not be assessed remotely, as well as requests for sick leaves. Despite the requirements for e-consultations being well described, patients were more likely to use the service if motivated directly from their GP.

A request for e-consultation must be replied within five days. Most GPs reported internal routines according to which, in case of delays, other GPs from the same practice could handle those requests. In case of absence, a substitute was always assigned and information on leaves was updated. Routines varied among individual GPs, even if belonging to the same practice: e-consultations were processed during the time between visits, at lunch, at the end of the day or during the evening.

«It is often required some afternoon and evening work. I try to answer continuously so that all requests are processed before weekend. But if requests accumulate, I can reserve time in my schedule»

Most GPs perceived a positive impact in terms of reduced workload for both receptionists and GPs, less crowded waiting rooms and fewer urgent visits. E-consultation was seen as a simple and secure communication channel with patients, especially those with a chronic condition. This enabled a more efficient exchange of information, which was also documented in the electronic patient journal.

«Through an e-consultation it is much easier to enable a good dialogue around follow-up of health problems»

Another benefit was improved patient follow-up via e-consultations due to the higher availability of the GPs. GPs also agreed that some patients managed to express more openly health issues through e-consultations.

«One patient wrote to me about issues he never told anyone before»

Despite the benefits of e-consultations, GPs mentioned that this service not always could replace regular visits. One limitation, for instance, was unclear communication.

«Sometimes it is not possible to understand the patient»

Use of e-consultations could imply additional work, especially after traditional working hours. Another limitation was that GPs could not initiate an e-consultation.

«E-consultations can only be initiated by the patient»

GPs were satisfied with the functionality of the platform, which made processing of e-consultations effective. A number of technical solutions were suggested to improve the service, such as the ability to process electronic transmission of files and images. GPs also recommended a feature to disable the service in their absence, and the possibility for patients to choose between different GPs. E-consultations via videoconferencing was seen as the next step.

«Perhaps we in the future can offer patients a videoconferencing service»

Electronic contact with the GP office (e-contact)

Use of the service differed among GP offices. Those that had newly started using the service received only a few contacts daily, while others with a longer experience answered up to 20-30 requests. The service was used to reschedule appointments, send answers for blood tests or digital imaging, provide information about vaccines, payments, or simple advices related to treatment. There were, however, situations of inappropriate use, especially when patients used electronic contacts with the GP office to address clinical questions. One reason might be related to unclear information regarding proper use. Another reason might be that, while this service was free of charge for patients, e-consultations had a fee. When such situations occurred, the office redirected the requests.

E-contact with the GP office was used about as much as e-consultations. As the service was new, there were not yet established formal routines. Offices were still struggling in defining

boundaries between e-contacts and e-consultations. With the purpose of making the service more efficient and standardised, patients' requests were categorised by the clinical staff.

The main advantage for the GP office consisted in a reduction of visits and phone contacts, which, in return, resulted in less waiting time for patients calling the office, as well as less workload for the clinical staff.

«I think it`s easier to give an answer [...] It`s quick, and it`s done without mail or phone. Because if you call people then they will talk about more. Now you can send a short answer, so the frequency is actually increasing now. It makes it a little easier to follow up and keep a close dialogue»

Interviewees indicated that the service saved time for patients by avoiding unnecessary waiting time spent on the phone. Moreover, a less busy phone line had a positive impact on patients still in need to call the office. Another benefit was that, conversely to phone contacts, e-contacts were documentable.

GPs were overall satisfied with the service and its functionalities. The only major limitation was related to uncertainties for patients on whether to use e-contact or e-consultation. In this respect, the service should be improved with more clear information.

E-contacts were considered as an alternative to phone contacts. Consequently, this service had a high potential to increase efficiency and reduce workload. Younger patients with higher computer literacy could benefit more from this service.

«Someone will always use the phone instead of electronic contact, for instance older people. The younger population will probably like it, and I hope they will use it more»

Finally, GPs were satisfied with the economic implications. The service did not require any additional cost, but it succeeded in releasing time for the health staff. The only concern was related to situations in which GPs provided answers to clinical requests without charging the fee for an e-consultation.

Discussion

Summary

Use of digital services for citizens in primary care in Norway is overall growing. Use of text-based e-consultations is in the early adoption phase and therefore in limited use.

Most GPs are positive to all services. Advantages for the GP office include reduced phone load, increased efficiency in administration and consequently more time for medical assessments, less crowded waiting rooms and more precise communication. Clear advantages for patients are ease of use, increased flexibility, increased autonomy, time and money savings.

However, children, elderly, people not familiar with technology as well as some patients receiving psychiatric care were examples of patients who required traditional alternatives. There is still some scepticism regarding the effects in terms of efficiency and clinical utility for e-consultations.

Comparison with existing literature

GPs perceptions towards e-booking and e-prescription renewal were almost entirely positive. Suggestions on how to improve the services included, for example, filtering of unnecessary bookings and possibility for e-booking of double appointments. Some GPs noted that the e-contact with the GP office was sometimes confused with e-consultations by the patients. This tendency was, however, not overwhelming. E-consultation was the only service entirely intended for clinical use. While the administrative services were implemented to a larger extent, the use of e-consultations by patients was still limited. Notably, some GPs expressed surprise that the clinical utility of e-consultations was better than expected. While it is demonstrated that written consultations between primary and specialist health have several benefits (7, 16), less is known about how text-based communication between GPs and patients affects clinical practice.

The experiences from early large-scale implementation in Sweden indicated that the use of digital services might increase over time after they are made available (17). In the present study, the initial volume of use for text-based e-consultations appeared to be limited. They also appeared to have little impact on demand for physical consultations, as the available appointments for physical consultations were still fully booked. Another study has pointed out that written communication between GP and patient can both supplement and replace physical consultations (18). In this study, however, an out-of-pocket fee was not charged for using the service, making a direct comparison with the service investigated in the present study questionable. The qualitative scope of the present study is not suited to detect non-obvious changes in demand and, consequently, cannot rule out the possibility that e-consultations affected physical consultations. Because of limited use from the patients, the need to implement new routines in the clinic in order to handle e-consultations were modest, and the requests were often processed between physical visits, at lunch or outside of regular office hours. It is likely

that an increase in use of the service would require the implementation of more rigorous routines in the GPs offices, for example allocating a set portion of the office hours to the handling of electronic consultations.

Strengths and limitations

This study employed a rigorous methodology for classifying and coding responses, reducing the impact of the authors' presumptions on the results. A limitation in this study was that the informants were recruited from a group of voluntary early adapters who may have been more enthusiastic than the general GP population. It is also possible that the informant group had higher technology proficiency or that they were less sensitive to annoyances than GPs at large.

Implications for research and/or practice

There were different routines among GP offices and even among individual GPs from the same practice. Organisational practices have a direct impact on the use of the service by GPs as well as on their perception of the effects. More experience is needed to standardise routines.

More defined and standardised routines, as well as more evidence of the effects, are necessary for large-scale adoption of digital health services for citizens in primary care.

Additional information

Ethical approval: Not relevant.

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2 **health services for citizens in primary care: a qualitative interview**

3 **study**

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6 **Abstract**

7 *Objectives*

8 To explore GPs' perceptions towards use of four digital health services for citizens: an

9 electronic booking service to make reservations with the GP; an electronic prescription

10 service to request renewal of maintenance drugs; a service for text-based non-clinical

11 enquiries to the GP office and a service for text based electronic consultation (e-consultation)

12 with the GP.

13

14 *Design*

15 A qualitative study based on semi-structured interviews.

16 *Setting*

17 Primary Care

18 *Participants*

19 Nine GPs from that were early adopters of the four services were interviewed.

20 *Method*

21 One moderator presented topics using open-ended questions, facilitated the discussion and

22 followed up with further questions. Phone interviews were conducted, audio recorded and

23 transcribed verbatim. Qualitative data were analysed using the Framework Method.

24 *Results*

25 The use of digital services in primary care in Norway is growing, although the use of text-

26 based e-consultations is still limited. Most GPs were positive about all four services, but there

27 was still some scepticism regarding their effects. Advantages for GP offices included reduced

28 phone load, increased efficiency, released time for medical assessments, less crowded waiting

29 rooms and more precise communication. Benefits for patients were increased flexibility and

30 autonomy and time and money savings. Children, the elderly and people with low computer

31 literacy might still need traditional alternatives.

1
2
3   1   *Conclusions*
4
5
6   2   More defined and standardised routines, as well as more evidence of the effects, are necessary
7
8   3   for large-scale adoption.
9
10   4   **Strengths and limitations of this study**
11
12   5   Strengths:
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14   6   -   The study investigates technology implementation in general practice.
15
16   7   -   Rigorous application of qualitative framework theory.
17
18   8   -   The results highlight themes that are relevant for clinicians and policy-makers.
19
20   9   Limitations:
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22   10   -   All GPs who participated in the study were voluntary early adopters, and thus
23
24   11   possibly more positive and competent with technology than the average GP
25
26   12   population.
27
28   13
29
30   14   **Introduction**
31
32   15   All GPs participating in this study are private practitioners who have established a contractual
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34   16   agreement with the municipality in which their practice serves the population. They are
35
36   17   financed through a variety of grants and reimbursements from the public sector, as well as
37
38   18   out-of-pocket payments (1). The organisation of GPs in the Norwegian public health care
39
40   19   system is referred to as the "general practitioners scheme". In an effort to provide citizens
41
42   20   with a uniform portal for communicating with their GP, the Norwegian Directorate for e-
43   21   health has developed the «Digital dialogue with the general practitioner», a suite of four
44
45   22   online services. By July 2018, these services were offered by 186 GP offices, which were part
46
47   23   of the public GP scheme (4732 GPs working in 1542 offices), in order to obtain user
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49   24   experiences prior to large-scale deployment. The four digital services are accessible to
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51   25   citizens from the private section of the national portal helsenorge.no. They are available after
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53   26   login and include:
54
55   27   1: an electronic booking service to make reservations with the GP
56
57   28   2: an electronic prescription service to request renewal of maintenance drugs, with direct
58   29   integration with the electronic prescription system of pharmacies
59
60   30   3: a service for text-based, non-clinical enquiries to the GP office (e.g. opening hours, results
       31   from diagnostic tests)

1   4: a service for electronic consultation (e-consultation) with the GP.

2   The first three services are mainly administrative, geared towards introducing less time-
3   consuming routines for both GP offices and patients, and free of charge for patients. E-
4   consultation is a clinical service, which requires patients to pay the same out-of-pocket fee as
5   for office visits. GPs are free to offer patients all four of the services or only some of them.
6   The portion of the population with Internet access in Norway is very high, and almost total in
7   the younger part of the population (2). It is therefore possible to assume that these electronic
8   services have a large potential user base.

9   Being the only clinical service in the suite, the e-consultation service warrants a more detailed
10   description. The service is a text-based service that is available on the same web page as the
11   rest of the services. The patients initiate an e-consultation by logging into a level 4 security
12   portal, where a written message can be sent to the GP. The message arrives in the GP's
13   electronic patient record system, and can then be answered. The service currently offered in
14   the present study conforms to the definition that e-consultation is an asynchronous, non-face-
15   to-face consultation using a secure electronic communication platform (3), where the doctor
16   answers clinical questions in a similar way to a standard consultation and answers are sent
17   electronically (4). The demand for services that enable digitally based communication
18   between the patients and their GPs is not new and has been around since the early days of the
19   Internet (5). While the use of online services in health care is on the rise, it is unclear whether
20   it benefits all socioeconomic segments of the population (6). E-consultations in primary care
21   have been mostly used to increase access to specialist care (7-10). However, the proliferation
22   of e-consultations and other digital health services used by citizens to communicate directly
23   with their GPs is limited, and consequently the body of literature from which to draw direct
24   comparisons is narrow.

25   The presented suite of digital health services for citizens has the potential to improve the
26   accessibility and efficiency of primary health care. However, government and vendors have
27   been criticised for being overly optimistic about the expected favourable outcomes from
28   employing health informatics (11). In order to release some of the potential of health
29   informatics systems, it has been argued that, among others, feature functionality, project
30   management and user-related outcomes affect implementation outcomes (12). The aim of the
31   present study was to explore GPs' perceptions towards use of digital health services for
32   citizens in primary care. Three main research questions were addressed: 1) which routines
33   were implemented by GPs who adopted digital health services for citizens? 2) What were

1   GPs' impressions of benefits and disadvantages of digital health services for citizens? 3) How

2   did GPs use digital health services for citizens?

3

4   **Methods**

5   *Patient and Public involvement*

6   The present study did not have patient involvement. All participants were voluntary medical

7   professionals (GPs). The results will be distributed to the study participants via e-mail mailing

8   lists that include both study participants and other GPs that did use the four services.

9   *Ethics*

10   According to the Norwegian Act on Medical and Health Research §2 and §4, the study did not

11   require approval from the regional ethics committee (REK), but the procedure for handling

12   the data was approved by the Data Protection Officer of the University Hospital of North

13   Norway.

14   *Data collection*

15   We conducted semi-structured interviews with GPs who adopted at least one of the four

16   digital services. Some GPs adopted the services since their early introduction in 2015, some

17   started using the services in 2016, while others adopted them only a few months before the

18   present study was conducted. We aimed to include 8-12 GPs, and conducted interviews until

19   we observed that interviewees began to repeat themes. After nine interviews, we decided that

20   the additional insight gained from each additional interview was diminishing, and concluded

21   that data saturation had been reached (13) for the main analytical categories.

22   A semi-structured interview guide was used to illustrate GPs' perceptions towards use of

23   digital health services for citizens. The interview guide was developed with a number of

24   questions for each of the four digital health services, as well as containing a few questions of

25   a more general nature. Some questions were previously tested in a pilot qualitative study on

26   the use of e-consultations. Consequently, the content of the interview guide was modified to

27   include the feedback collected during the pilot study.

28   One moderator (AJF), who did not have any relationship with the interviewees beforehand,

29   conducted the interviews. The moderator presented topics using the open-ended questions in

30   the interview guide, facilitated the discussion and followed up with further questions. The

31   interviewees could discuss their experiences freely. The moderator also sought to summarise

32   discussions around each topic to verify interpretations of the GPs' answers. The interviews

1 were conducted by phone due to long distances to GPs' offices. Interviews were audio
2 recorded and transcribed verbatim in Norwegian. Quotes relevant for this paper were
3 translated into English.

4 *Data analysis*

5 Data were analysed by a multidisciplinary research team consisting of three members (AJF,
6 IMH and PZ) with a background in psychology, social science and health technology.
7 Qualitative data collected from the interviews were analysed using the Framework Method
8 (14). After transcription of the audio recordings, a sample of two interviews was randomly
9 selected to let the research team familiarise itself with the transcripts and develop initial
10 impressions and potential ideas for codes. Transcripts were then thoroughly read and
11 independently analysed by each member of the research team. Interesting segments of text
12 were underlined and notes were made in the margins of the transcripts to describe the content
13 of each passage with coding labels, as well as with more detailed information supporting the
14 interpretation of the results. The members of the research team later met to share the coding
15 labels, which they had assigned to the two transcripts. Each passage was analysed to discuss
16 why it was interpreted as meaningful and how it could be useful to address the research
17 questions. The coding labels used to describe each passage were compared to find similarities
18 in the interpretations of the content and to resolve differences. Finally, a working analytical
19 framework was developed around a set of codes that were explained by a short definition.

20 The remaining seven transcripts were then assigned to the three members of the research team
21 and analysed using the analytical framework. New codes that were not included in the initial
22 framework were assigned together with the already defined codes as additional impressions
23 emerged. Regular team meetings were conducted during the process of analysing transcripts
24 to discuss new codes, group together codes that were conceptually related, and to refine the
25 initial analytical framework. The analytical framework was refined until no new codes were
26 generated. The final analytical framework [**Table 1**] consisted of fifteen codes grouped into
27 five categories, each including a brief explanatory description of their meaning.

28 The final analytical framework was applied to all the transcripts by assigning appropriate
29 codes to each meaningful passage of text. Data were then summarised in a framework matrix
30 using Microsoft Excel. The framework matrix consisted of one column per interviewee and
31 one row per code. A separate sheet was used for each of the four digital health services
32 explored in this study. Data from transcripts were summarised using verbatim words and
33 inserted into the corresponding cell in the framework matrix. The qualitative data included in

1 the framework matrix were finally reviewed to make connections across interviewees and

2 categories and to identify common themes as well as individual differences (15). Results were

3 summarised and presented separately for each of the four digital health services.

4 **Table 1.** Framework matrix.

Use	Description
Extent of use	The extent to which the service is used by the staff
Inappropriate use	When the service is not used correctly
Suitable for	Situations for which the service is most useful
Unsuitable for	Situations for which the service cannot be used
Motivation and incentives	Factors affecting users' motivation to use the service
Routines	
Doctor's office	How the office is organised around the service
General practitioners and staff	How the service is integrated into individual routines
Advantages	
Doctor's office	The main benefits for the staff of the doctor's office
Patients	The main benefits for the patients
Disadvantages	
Criticisms and potential improvements	Organisational problems regarding the service delivery
Technical challenges and limitations	Technical problems regarding the service functionality
Time and efficiency	Impact of the service on the staff's productivity
Economics	Economic impact of the service
Other issues	
Perceptions	Individual thoughts around the service
Written communication	Impact on the communication with patients

5

6 **Results**

7 Nine GPs from different offices [**Table 2**] were interviewed in the period from September

8 2017 to November 2017. Each interview lasted from 30 to 60 minutes.

9 **Table 2.** Participants

ID	GENDER	AGE GROUP (YEARS)	HEALTH REGION	DISTANCE TO NEAREST HOSPITAL (KM)	POPULATION OF MUNICIPALITY (2018)
GP1	Male	60-69	South Eastern	34	<50k
GP2	Male	50-59	South Eastern	7	50-100k
GP3	Female	30-39	South Eastern	7	50-100k
GP4	Male	60-69	Western	3	100-200k
GP5	Male	40-49	South Eastern	5	100-200k
GP6	Male	40-49	Western	18	<50k
GP7	Female	60-69	Western	1	200-300k
GP8	Male	50-59	Western	10	200-300k
GP9	Male	40-49	South Eastern	23	100-200k

10 Table shows participant demographics.

11 *Electronic booking*

12 The amount of appointments available for electronic booking (e-booking) varied among

13 practices. One GP office began by having all time slots open for e-bookings. However, the

procedure was modified by keeping some time slots unavailable for e-booking in order to have more flexibility for patients who preferred to book in person or by phone. Other GP offices decided to restrict specific time slots to meetings or administrative work.

«[…] sometimes there are time slots available for regular appointments, but not for e-bookings»

One GP office has not adopted e-booking yet due to limitations in managing different lists of patients for GPs of the same practice. The demand for e-booking was especially high among technology-oriented patients. The extent to which e-booking was available also varied among GP offices. Some GPs published all time slots six months in advance, while others only offered one month ahead. Requests for emergency appointments were generally not available through the service.

Despite different routines, GPs agreed that e-booking had obvious benefits and perceived the service as effective and timesaving. Reduced phone load was emphasised as a significant gain from several GPs. One of the GPs reported that he had performed a measurement that indicated about a quarter reduction in telephone load. Consequently, the staff had more time available for other important tasks. Reduced phone load also brought benefits for less technology-oriented patients, who prefer regular phone-booking. According to the GPs, patients considered e-booking useful and preferable to regular booking, mainly due to time savings. Patients were also less dependent on GP offices' opening hours. Patients with a tight schedule experienced increased autonomy as it was easier for them to book an appointment online that fitted with their schedule. GPs mentioned only a few disadvantages. Experience showed that e-booking was not suitable for everyone. Children, elderly, people not familiar with technology as well as some patients receiving psychiatric care were examples of patients who might require traditional booking alternatives. Moreover, GPs had less information on patients' reasons for requesting an appointment when the booking was made electronically.

GPs were generally satisfied with using e-booking for regular appointments, and were positive about the potential use for emergency appointments.

«Doctors are generally sceptical about making emergency appointments available for e-booking, but we actually have a positive experience of this. The service is seldom used improperly».

The users of e-booking highlighted a number of limitations. For instance, when GPs made changes, these were not updated and visible until the next day. Another drawback was the

impossibility of filtering unnecessary appointments in the same way as by phone, or modifying the required time for appointments. One GP highlighted some challenges in using same-day appointments, available for booking from 4 PM the day before.

«It takes time for patients to understand this, so when looking for a time slot two days in advance, they can't find it. Then they try to book an appointment with another doctor, despite there being many time slots available with their own doctor. But we have always been concerned with explaining concepts and educating citizens on how to do this».

Improper use rarely occurred. When using e-booking, most patients generally booked single appointments, even if they might need a double appointment. GPs found it easier to clarify such matters by regular phone booking and missed the option of e-booking double appointments. Another challenge mentioned was the inappropriate request for vaccination.

Electronic prescription renewal

GPs adopted different procedures for handling electronic prescription (e-prescription) renewals. Some GP practices made new requests available in a common inbox that was checked daily, thus ensuring that renewals were processed even if the responsible GP was absent. One GP preferred to process all e-prescriptions by himself, while another interviewee delegated them to a medical secretary. GPs processed requests between consultations or at the end of the day, sometimes requiring overtime work.

«In the way the GP scheme has been evolving, we may have ended up with more work in the evenings».

GPs mentioned a number of benefits of e-prescription, including fewer incoming calls, increased efficiency in administration resulting in freed up time for medical assessments, less pressure in the waiting room and in the GP office, improved dispatching priority and more precise communication.

«Fewer phone calls is probably the main advantage in addition to less hassle in notifying that a prescription is ready, for instance».

Obvious advantages for patients were, according to GPs, time and money savings because they did not have to show up at the GP office to renew a prescription. However, one GP thought that it could become too easy to renew a prescription for patients who should have had a prescription review. The service could potentially involve additional work for GPs if

they needed to explain patients why a renewal was refused, access their medical records and look up former use of medication, or receive many prescription requests at the same time. Another GP thought that the interface was slow.

«The number of clicks and processes was somewhat easier - a bit easier than (the previously used) SMS-service. However, if you look at the doctor's work involved in managing the service in relation to attending patients, we spend more time.»

The service was perceived by most GPs as best suited to renewals for chronic patients on complex medication schemes.

«E-prescribing [...] provides a much more complete overview of when patients took their medicine. This makes it easier for other doctors in the system to follow up».

Some GPs believed the service could be an effective solution for "simple" infections, frequently prescribed medications such as benzodiazepine and sporadic medications such as painkillers and allergy medications. The GPs were somewhat divided regarding the prescription of potentially addictive medication.

«Ideally, addictive medications of benzodiazepine should not be renewed like this, but it depends on each situation».

However, other GPs held a different position regarding medications used for long-term treatment.

«Frequently prescribed medications taken daily for chronic diseases are renewed once a year at a yearly control. There we can see [...] if there is anything to change [...]. Renewal by electronic prescription removes the possibility for adjustment. [...] it is best suited for those medications that are easy for people to keep control of and understand when they should consult their doctor if there is something that isn't working well, such as recurrent urinary tract infections».

E-consultation

The service was only used to a limited extent by the patients. GPs reported 1-2 e-consultations per day, which occurred in the form of a dialogue between patient and GP. E-consultations were used for remote follow-up of health problems previously discussed during in-visits. Through an e-consultation, a GP could adjust a treatment, prescribe referrals or provide

1 information. GPs could also assess, for example, signs of eczema upon receiving pictures
2 electronically.

3 *«It should be a known problem, of a medical nature and regarding a known patient»*

4 GPs were generally satisfied about how much could be done without an office visit.

5 *«Far better than I thought, depending on how well the patient describes the problem*
6 *[...] Perhaps 20-30% of the situations require personal attendance»*

7 There were, however, cases in which e-consultations could not be used. These included newly
8 emerged clinical problems, which could not be assessed remotely, as well as requests for sick
9 leaves. Despite the requirements for e-consultations being well described, patients were more
10 likely to use the service if motivated directly by their GP.

11 A request for e-consultation in this particular system must be replied to within five days. Most
12 GPs reported internal routines according to which, in case of delays, other GPs from the same
13 practice could handle those requests. In case of absence, a substitute was always assigned and
14 information on leaves was updated. Routines varied among individual GPs, even if belonging
15 to the same practice: e-consultations were processed during the time between visits, at lunch,
16 at the end of the day or during the evening.

17 *«Some afternoon and evening work is often required. I try to answer continuously so*
18 *that all requests are processed by the weekend. But if requests mount up, I can book*
19 *time in my schedule»*

20 Most GPs perceived a positive impact in terms of reduced workload for both receptionists and
21 GPs, less crowded waiting rooms and fewer urgent visits. E-consultation was seen as a simple
22 and secure communication channel with patients, especially with those who have a chronic
23 condition. This enabled a more efficient exchange of information, which was also
24 documented in the electronic patient journal.

25 *«An e-consultation makes it much easier to have a good conversation around the*
26 *follow-up of health problems»*

27 Another benefit that was perceived by many GPs was improved patient follow-up via e-
28 consultations due to the higher availability of the GPs. GPs also agreed that some patients
29 managed to express themselves more openly on health issues through e-consultations.

30 *«One patient wrote to me about issues he had never told anyone about before»*

1 Despite the benefits of e-consultations, GPs mentioned that this service could not always

2 replace regular visits. One limitation, for instance, was unclear communication.

3 *«Sometimes it's not possible to understand the patient»*

4 Use of e-consultations could imply additional work, especially after traditional working hours.

5 Another limitation was that GPs could not initiate an e-consultation. In general, GPs were

6 satisfied with the functionality of the platform, which made processing of e-consultations

7 effective. A number of technical solutions was suggested to improve the service, such as the

8 ability to process the electronic transmission of files and images. GPs also recommended a

9 feature to disable the service in their absence, and the option for patients to choose between

10 different GPs. E-consultations via videoconferencing was seen as the next step.

11 *«Perhaps in the future we could offer patients a videoconferencing service»*

12

13 *Electronic contact with the GP office (e-contact)*

14 Use of the service differed among GP offices. Those that had just started using the service

15 received only a few contacts daily, while others with a longer experience answered up to 20-

16 30 requests. The service was used to reschedule appointments, respond regarding blood tests

17 or digital imaging, provide information about vaccines, payments or to simple treatment-

18 related advice. There were, however, situations of inappropriate use, especially when patients

19 used electronic contact with the GP office to address clinical questions. One reason might be

20 related to unclear information regarding proper use. Another reason might be that, while this

21 service was free of charge for patients, e-consultations had a fee. When such situations

22 occurred, the office redirected the requests.

23 E-contact with the GP office was used about as much as e-consultations. As the service was

24 new, no formal routines had been established yet. Offices were still struggling to define

25 boundaries between e-contacts and e-consultations. With the purpose of making the service

26 more efficient and standardised, patients' requests were categorised by the clinical staff.

27 The main advantage for the GP office consisted of a reduction in the number of visits and

28 phone contacts, which, in return, resulted in less waiting time for patients calling the office, as

29 well as less workload for the clinical staff.

30 *«I think it`s easier to give an answer [...] It`s quick, and it`s done without mail or*

31 *phone. Because if you call people, they will talk about more. Now you can send a short*

1   *reply, so the frequency is actually increasing now. It makes it a little easier to follow up*

2   *and keep a close dialogue»*

3   Interviewees indicated that the service saved time for patients by avoiding unnecessary

4   waiting time spent on the phone. Moreover, a less busy phone line had a positive effect on

5   patients who still needed to call the office. Another benefit was that, unlike phone contacts, e-

6   contacts were documentable.

7   GPs were overall satisfied with the service and its functionalities. The only major limitation

8   was related to uncertainties among patients on whether to use e-contact or e-consultation. In

9   this respect, the service should be improved with more clear information.

10   E-contacts were considered an alternative to phone contacts. Consequently, this service had a

11   high potential of increasing efficiency and reducing workload. Younger patients with higher

12   computer literacy could benefit more from this service.

13   *«Someone will always use the phone instead of electronic contact, such as older people. The*

14   *younger population will probably like it, and I hope they will use it more»*

15   Finally, GPs were satisfied with the economic implications. The service did not require any

16   additional cost, but it succeeded in releasing time for the health staff. The only concern was

17   related to situations in which GPs provided answers to clinical requests without charging the

18   fee for an e-consultation.

19

20   **Discussion**

21   *Summary*

22   Use of digital services for citizens in primary care in Norway is increasing. Use of text-based

23   e-consultations is in the early adoption phase and therefore in limited use.

24   The most commonly reported advantages for the GP office include reduced phone load,

25   increased efficiency in administration and consequently more time for medical assessments,

26   less crowded waiting rooms and more precise communication. Clear advantages for patients

27   are ease of use, increased flexibility, increased autonomy and time and money savings.

28   However, some GPs raised concern that children, the elderly, people unfamiliar with

29   technology and some patients receiving psychiatric care were examples of patients who

required traditional face-to-face alternatives. There is still some scepticism about the effects in terms of efficiency and clinical utility for e-consultations.

Comparison with existing literature

GPs' perceptions towards e-booking and e-prescription renewal were almost entirely positive. Suggestions on how to improve the services included, for example, filtering of unnecessary bookings and the option to e-book double appointments. Some GPs noted that the e-contact with the GP office was sometimes confused with e-consultations by the patients. However, this tendency was not overwhelming. E-consultation was the only service entirely intended for clinical use. While the administrative services were implemented to a larger extent, the use of e-consultations by patients was still limited. Notably, some GPs expressed surprise that the clinical utility of e-consultations was better than expected. While it is demonstrated that written consultations between primary and specialist health have several benefits (7, 16), less is known about how text-based communication between GPs and patients affects clinical practice.

The experiences from early large-scale implementation in Sweden indicated that the use of digital services might increase over time after they are made available (17). In the present study, a common impression among the GPs was that the initial volume of use for text-based e-consultations appeared to be limited. They also appeared to have little impact on demand for physical consultations, as the available appointments for physical consultations were still fully booked. Another study has pointed out that written communication between GP and patient can both supplement and replace physical consultations (18). In this study, however, an out-of-pocket fee was not charged for using the service, making a direct comparison with the service investigated in the present study questionable. The qualitative scope of the present study is not suited to detecting non-obvious changes in demand and, consequently, cannot rule out the possibility that e-consultations affected physical consultations. Because of limited use from the patients, the need to implement new routines in the clinic in order to handle e-consultations were modest, and the requests were often processed between physical visits, at lunch or outside regular office hours. It is likely that an increase in use of the service would require the implementation of more rigorous routines in the GPs' offices, such as by allocating a set portion of the office hours to handling electronic consultations. A recent study highlighted that GPs can be reluctant to implement alternatives to face-to-face consultations, despite policy pressure (19). We did not observe this reluctance in the present study, possibly

1 due to the characteristics of the GPs included in the study, which are pointed out in the
2 strengths and limitations section.

3 *Strengths and limitations*

4 This study employed a rigorous methodology for classifying and coding responses, reducing
5 the impact of the authors' presumptions on the results. A limitation in this study was that the
6 informants were recruited from a group of voluntary early adapters, who may have been more
7 enthusiastic than the general GP population. It is also possible that the informant group had
8 higher technology proficiency or that they were less sensitive to annoyances than GPs in
9 general.

10 *Implications for research and/or practice*

11 There were different routines among GP offices and even among individual GPs from the
12 same practice. Organisational practices have a direct impact on the use of the service by GPs,
13 as well as on their perception of the effects. More experience is needed to standardise
14 routines.

15 More defined and standardised routines, as well as more evidence of the effects, are necessary
16 for large-scale adoption of digital health services for citizens in primary care.

17 **Additional information**

20 Ethical approval: Not relevant.

21 Competing interests: The authors declare no conflict of interests.

24 Data availability: No additional data available.

25 Author statement: Fagerlund conducted the data collection. The authors Fagerlund, Holm and
26 Zanaboni contributed equally in the analysis of the results and the preparation of the
27 manuscript.

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	Page/line no(s).

Title and abstract

Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	1/1
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	2/5

Introduction

Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	4/22
Purpose or research question - Purpose of the study and specific objectives or questions	4/29

Methods

Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	6/3
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	5/24, 6/1
Context - Setting/site and salient contextual factors; rationale**	5/28
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	5/14
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	5/6
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	5/29

1

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	5/25
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	5/11, table2
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	5/30
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	6/3
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	6/11

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	Table1
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	8/1, throughout result section

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	13/18
Limitations - Trustworthiness and limitations of findings	14/30

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	15/11
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	15/8

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

2

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014 DOI: 10.1097/ACM.0000000000000388