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Shared patient information and trust: a qualitative study of a national eHealth system

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Abstract

Background In Norway, as in other countries, national eHealth systems, such as the Summary Care Record (SCR), have been implemented to improve the collaboration around patients by sharing patient information between health professionals across healthcare institutions and administrative levels. Although widely implemented across the health and care services in Norway, evaluations of the SCR indicate less use than expected. There is a need for analysis that lays out the visions and expectations of the SCR and contrasts these with detailed observations of use in everyday health professional work. This study adds to the eHealth research field by exploring this reality.

Method This paper has a qualitative design with an ethnographic approach, including participant observation, qualitative interviews, and a document review. Qualitative individual interviews with 22 health professionals and six weeks of participant observation were conducted, and eight documents were reviewed. The field notes and the interview-transcriptions were analyzed following a stepwise-deductive induction analysis.

Results The document review identified the expectations and visions of the SCR, including an underlying assumption of trust in shared patient information. However, this assumption is implicit and not recognized as a crucial element for success in the documents. In our observation and interview data, we found that health professionals do not necessarily trust information in the SCR. In fact, several procedures and routines to assess the trustworthiness of SCR information were identified that complicate and disturb the expected use. In our analysis, two main themes characterize the health professionals' handling of the SCR: *adapting to workflow* and *dealing with uncertainty*.

Conclusion Our study illustrates that unconditional trust in shared patient information is an implicit assumption in SCR policy documents, but in their everyday work health professionals do not necessarily unconditionally trust shared patient information. Rather, sharing patient information through technology, such as the SCR, requires of health professionals to critically assess the digital information. The information in the SCR, as all sources of information presented to health professionals, becomes an item for their constant trust-work. Our study is of value to policy-makers, health information systems developers, and the field of practice both nationally and internationally.

Keywords National eHealth system, Summary care record, Health professional, Ethnographic approach, Trust-work, Script, Scenario, Norway, eHealth

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Background

In the early years of digital health information systems (HIS), each institution typically had its own system. This solved the problem of communication and information exchange within the institution but not the need to exchange information across institutional borders.

The clinical encounter between a patient and a health professional (HP) is the building block of everyday medicine. During the encounter, HPs must gather information about the patient's problem, assess information that has been made available, make and execute decisions, and finally document the decisions that were made and subsequently set them in motion. An increasing group of patients have needs that require a multidisciplinary approach at different levels and institutions in the health and care service. To make informed decisions, each HP will need information concerning the decisions made by other HPs. Currently, eHealth systems for information exchange and communication between hospitals, general practitioners (GP), and home care services are expanding worldwide [1–3].

Huge investments in eHealth systems suggest that big challenges in health and care services, such as the pressure and problems related to an aging population, long-term and complicated chronic diseases, and fragmented healthcare, can be met with technological improvements [2]. Previous studies have shown that sharing electronic documents is essential in coordinating health and care services across organizational boundaries [4]. A systematic review exploring factors influential to the implementation of eHealth has found that no single factor was identified as a key facilitator or barrier but that issues around implementation are multi-level and complex [4]. Other reviews have concluded that eHealth systems could improve access and exchange of information, improve the quality of care, and support policymaking, but underline that for these "benefits to actualize, it is critical to focus on their implementation, which requires attention to more than just the technology" ([5] p.2046). While trust is a much-researched topic in the health sciences [6], to our knowledge, research into HP trust in national eHealth systems is lacking.

This study was conducted in Norway. Currently, Norway has two national eHealth systems for sharing patient health information between and across the healthcare sector: "e-prescription" and "the summary care record" (SCR). This study focuses on the latter, SCR. The SCR is the first national digital solution for sharing patients' health information between professionals across different levels and institutions in health and care services in Norway. It is used both in the primary care sector and in hospitals. The SCR is integrated with electronic health records (EHR) and is an electronic service that contains essential health information such as critical information, a pharmaceutical summary, appointment history (hospitals), contact information to the next of kin, and the name and contact information of the GP.

White papers in Norway have for many years pointed out the need for better cooperation and information sharing across all levels of the health and care service, and in 2008, it was determined that a National SCR should be considered [7]. During 2013–2017, the SCR was implemented in all hospitals, emergency call centers, out-of-duty medical response offices, and 90% of the GP clinics [8]. The implementation of the SCR in nursing homes and home care services started in 2019, and a full national rollout of the SCR is expected within 2025 [9, 10].

Scotland, England [3], Sweden [11], and Norway [12] are among the countries that have implemented nationwide EHRs. A study conducted in Norway shows that eHealth systems, such as the SCR, have been used considerably less than expected by the health authorities before the implementation [13]. Further, it has been highlighted that the perception of success could differ from those who implemented the technology to those who used it [13]. One of the arguments for establishing the SCR was to reduce medication errors; to obtain this effect, sharing information, such as the pharmaceutical summary in the SCR, is considered crucial [14]. However, the problem is complex since HPs perceive obtaining the medication list as fragmented, complex, risky, time-consuming, and causing uncertainty [15]. This is mainly related to the critical phase of a patient's transition between levels of care [15].

Even though the Norwegian SCR is intended to be used by nurses, medical doctors (MD), and other HPs, studies have focused on MDs use of the SCR [12]. Limited research has been done on everyday use of the SCR across professions and levels of care. Our ethnographical approach adds to an interdisciplinary research field on eHealth by including multiple professions: nurses, a physiotherapist, and MDs, and from both primary and specialist health care.

Numerous studies have explored patient trust in HPs, doctor-patient relations, or public trust in health information exchange. Studies on measuring trust in the health system are growing but focus mainly on the relationship among MDs, nurses, and patients and not on relations between humans and technology [6]. A previous study on the SCR found that trustworthiness in information being shared is an important aspect of MDs use and experience with the SCR [12]. The study also emphasized that what kind of data sources that is trusted or preferred "is a much-less-explored topic" (12, p. 8) when it comes to shared health information. A recent synthetic review

over the last fifty years of trust research in health care emphasizes that "trust plays a critical role in facilitating health care delivery" (16, p. 126) and found that the literature on trust was mostly on patient trust in clinicians [16]. To our knowledge, there have been few studies on the trust assessment of information in HP workflow and trust assessment of national eHealth systems that share patient information.

Theoretical framework

This article presents an analysis of technology in practice in multidisciplinary and cross-institutional collaborations, anchored in core concepts from Science and Technology Studies (STS) that emphasize the interactions between social and technical elements.

STS is an interdisciplinary field exploring social construction and technology and their interaction. To explore the visions and expectations of a national eHealth system and be able to contrast these with observations of how the system is experienced and used in practice, we lean our analysis on the concepts of "scenario" [17] and "script" [18]. These analytical entrances help us unpack the sociotechnical practices and visions embedded in the SCR and thus pave the way for an in-depth understanding of a practice that otherwise might be fleeting and difficult to grasp.

Scenario and script

New technologies are never produced or introduced in a neutral way. Rather, they come with scenarios for the universe the technology is entering. Callon [17] has illustrated the notion of scenario in his study of the development of an electric car in the early 1970s. In the development of the electric car, the developers and designers have constructed scenarios to shape and imagine the future in which the car would exist. Outlining these scenarios can show how social, economic, and political considerations are built into technology [17]. This is how we used the notion of scenario to analyze the goals, values, interests, and possibilities that were written, implicit or explicit, in documents about the SCR.

Akrich [18] has developed the notion of script as a tool to conceptualize how technology designers can inscribe values into technology. The analogy of a film script makes us aware of how there exist defined expectations towards who the actors should be, these actors' roles and responsibilities, the distribution of tasks between them, and the different actors' needs and interests. The presumptions in a script are not only about the individual character of the various actors, but also about the environment in which the technology will be used and their visions about the world. The analogy to the film metaphor is useful, Akrich [18] argues, because it shows that technological scripts, like film scripts, are not static but leave a margin of freedom to the actor. To use the film metaphor on our study, we interpret the human actors to be the HPs, and the non-human actor is the SCR that comes with a technological script, inscribed by human actors like developers, programmers and vendors, but played out on scenes where these human actors are not present. There are numerous negotiations and renegotiations between the HPs and the SCR. The HPs use the freedom to interpret, negotiate and renegotiate the script and their roles in it, as well as the roles of the SCR itself. Along with the notion of the script, Akrich and Latour [19] have developed an extended vocabulary, which can be useful to describe the negotiation and renegotiation between actors. The script is dynamic and can adjust and change; it rescripts. Technology can have a strong or weak script, which refers to the flexibility in the use of the technology. "A strong script suggests a certain kind of use, while a weaker script suggests a larger degree of flexibility" ([20] p.390). As an analytical tool, script sensitized us to how human actors (HPs) negotiate and adapt the technology (SCR) to their work and how everyday practice adjusts in meeting the technology (SCR).

Hence, this study aims to use a combination of the concepts scenario and script as a lens to review documents on national eHealth systems, and contrast these to our data on how HPs use and experience a national eHealth system in their work. More specifically, we ask the following research questions: What visions and expectations are written into the Norwegian SCR script? How do HPs use and experience the SCR in everyday work?

Methods

This study has a qualitative design with an ethnographic approach, including participant observation, qualitative interviews, and a document review. Drawing on Charmaz [21], the definition of ethnography was "stretched" to involve supplementary data such as documents and interviews and not only participant observations.

Study context and data collection

This study was conducted at a hospital, a home care service, an intermediate unit, and a service allocation unit. They were all located in the same municipality in Norway. The municipality is characterized as a large municipality with more than 20,000 residents [22]. A purposeful sampling approach was used to recruit the hospital, municipality, units, and participants for this study. In this context, purposeful sampling strategically selects information-rich participants and cases relevant to the research questions [23]. The municipality was strategically chosen because it had implemented the SCR.

Table 1 Overview of the empirical data collection methods

Data collection method	Participant observation	Individual interviews	Document review
Data sources	Intermediate unit (2 weeks)	5 nurses 4 medical doctors	Policy and strategic documents: 2 Whitepapers 1 Consultation paper 3 Strategic documents
	Home care service (1 week)	4 nurses	Practical documents: 1 website 1 Guideline for best practice
	Emergency unit hospital (3 weeks)	5 medical doctors 2 nurses	
		Phone interviews with service allocation unit: 1 nurse 1 physiotherapist	

The field work in the intermediate unit lasted for two weeks, in February–March 2021. During that time, individual interviews with five nurses and four MDs from this unit were conducted, in addition to daily observations. Three-week participant observations were conducted in the emergency unit in August–September 2021. During that time, five individual interviews with MDs and two individual interviews with nurses were conducted. The emergency unit at the hospital was strategically selected since the SCR was described as an important tool in an emergency setting [24]. In the home care service, one-week of participant observation and four individual interviews with nurses were conducted in September 2021. Two individual interviews with HPs in the service allocation unit were conducted over the telephone in December 2021. To summarize, the data collection consists of six weeks of participant observation and 22 individual interviews, as illustrated in Table 1. The duration of the interviews ranged from 17 to 80 min, with most interviews having a duration of 30 min. The reason for this variation in length is related to the workflow of the interviewees, as they were interviewed during workhours it varied how unpredictable and busy their schedule was and how much time they could set aside for an interview.

Content of observational studies and individual interviews

Observation is a method that "focuses on what people do, while interviews focus on what they say (they do)" (25, p.56). Observation studies can be suitable for exploring and getting insights into interaction and different aspects of a workplace by observing the setting, activities, and actors in their practices [25] and can better the understanding of the context of the study [23]. This study used participant observation to gain a deeper understanding of sharing patient information between and across primary and specialist health and care services and how a national eHealth system was used. During the participant observation, the first author followed the HPs around the units. This includes participating in daily and weekly meetings. Most of the participant observation was conducted in the HPs workspaces, which consisted of a desk with a computer, to get an insight into how and when the HPs gathered information about the patients. The first author took field notes during the participant observations to help recall the events in different situations.

Individual interviews were conducted as focused interviews. Focused interviews can be suitable for work-related studies when the interviews occur during work hours, and "the researcher can't expect to have in-depth interviews that last for an hour or longer un-disturbed" (25, p.102). Tjora [25] argues that focused interviews can be useful when the topic is limited; trust can be gained early in the interview and when the topics to be discussed are not very sensitive or difficult. The focused interviews took place during the participant observations in the different units. Therefore, the interview was conducted at the participants' workplace during work hours, and the location was either a meeting room or an office. The interview guide started with warm-up questions, such as "how long have you worked as a HP?", "what is your position here?" Next, questions such as "how familiar are you with the SCR?" were posed, followed by questions concerning HPs' experiences with the SCR. The interview guide was developed for this study, which was part of a PhD project in health sciences. The English version of the interview guide is saved as Supplementary file 1.

Data analysis of individual interviews and participant observation

The field notes and the transcription was analyzed by a stepwise-deductive induction analysis (SDI) [25]. The analysis begins inductively and subsequently draws on existing theory through the analytical phase. The first step of the analysis was inductive empirical close coding,

Table 2 Examples of the analytical work

Empirical close codes	Code Group	Themes
Easy to use as a platform		
Just another place		
All the information we had		Adapting to workflow
Told that they can't trust the mediation list		
What would I have done without it		
Never registered critical information	Health professionals use and non-use of the SCR	
Pinch of salt		
Have information they trust more		
Limited information		
Checks—even if the patient is familiar		Dealing with uncertainty
I don't know if I have access		
Something that the "doctors use"		
Getting the information from other places		
Does not see the purpose		
I don't know what it is		
Have access, but don't use it		

which is inspired by grounded theory [21]. The coding was grounded in the empirical data and corresponded closely to the detailed description of concrete situations (field notes) or close to the participants' statements (individual interviews). This process prevents the codes from being drawn from theories or research questions and ensures that the codes are grounded in empirical data [25]. The first author transcribed all the interviews verbatim and performed the empirical inductive coding in the NVivo software, which resulted in approximately 700 empirical-based codes. Some of the field notes were not coded but provided contextual understanding for the authors. The next step was grouping the codes with internal thematic connections relevant to the research questions into code groups, resulting in nine code groups. Two of the code groups were relevant for this article: seeking and sharing information through the SCR and the non-users of the SCR. These code groups were merged and were labeled HPs use and non-use of the SCR. The code groups were further explored, and theory was applied to support the analysis for understanding the empirical material. This was an ongoing back and forth process between the notion of script and the empirical data. The two themes identified through the analysis are *adapting to workflow* and *dealing with uncertainty*, as illustrated in Table 2. During the analysis, uncertainty emerged as a theme. We then further explored uncertainty and found that HPs dealt with uncertainty by doing trust-work.

Document review

The necessity of conducting a document review arose during the analysis of the individual interviews and participant observations. To search for future scenarios and the explicit and implicit visions about the SCR, we conducted a document review. The document review was inspired by a "following the document-issue" approach [26], the "document-issue" in our case being mentioning's of the SCR. Following the document-issue means "analysing where it [SCR] emerges in the first place and how it becomes an issue, including which kind of issue" (26, p. 115). The documents were selected based on this approach, which meant we started with the Norwegian "Coordination reform," a white paper in which the SCR was first mentioned [7]. Then, we "followed the issue" by selecting white papers relevant to the SCR's development (see Table 1) to explore the future scenarios laid out for the SCR. We also included practical documents, such as the website "What is the Summary Care Record?" [8] and "Summary care record. User guide for best practice" [27] to explore how these script the SCR. The document review consisted of six policy and strategic documents and two practical documents (see Table 1). Our theoretical approach, STS, means that we interpret documents as a form of technology that is never completely neutral. "They come from somewhere and they are integral to the very issues and controversies that unfold in society" (26, p.3). Documents were imported into NVivo software, scrutinized, and coded through the theoretical lens of scenarios and script. The coding resulted in 49 codes focusing on the implicit or explicit visions of the SCR, and three themes were identified through the document

review: *solving the problem of coordination and information sharing*, *the red icon: a national alert system*, and *the idea of a seamless information system.*

Results

In this section, we present our main findings. First, we present the visions and expectations of the SCR identified in the document review. Next, we explain how these expectations are experienced and lived out among the HPs per the analysis of participant observations and individual interviews.

Findings from the document review

Three themes were identified through the documents review: *solving the problem of coordination and information sharing*, *the red icon: a national alert system*, and *the idea of a seamless information system*.

Solving the problem of coordination and information sharing

The policy documents describe the healthcare sector as fragmented and consisting of siloed systems with problems related to coordination, information sharing, and access to necessary information, such as medication lists and critical patient information, in emergencies [7, 24, 28]. The patient health information is stored in equally siloed systems, reflecting the healthcare sector institutions (GPs, the municipalities' health and care services, hospitals, and private specialists) who base their choice of EHR systems on their local needs [24]. This inhibits access and information gathering across health institutions in complex patient trajectories [24]. Lack of coordination and information sharing between health and care services is a risk to patient safety [7, 24, 28]. The need for better coordination and information sharing across all levels of the health and care service is presented in numerous white papers in Norway. Published in 2009, the white paper "The coordination reform" recognizes that coordination within the health and care services had been a problem for many years and that the health and care sector needed to develop better coordination; this is where the SCR (then called the national core journal) was mentioned for the first time in a white paper [7]. Published in 2012, the white paper "One citizen-one Journal" [24] emphasizes the need to modernize the ICT platform and work for a standard solution for the entire health and care sector; subsequently, the SCR was established. The first national eHealth strategy in Norway was published in 2017 [29]. The national eHealth strategy was established to create a common direction for digitalization nationally and to contribute to achieving political goals in the health and care sector. The national eHealth strategy builds on the white paper "One citizen-one Journal" [24]. The document review show that the political goal is to establish stronger national coordination of digitalization work in the health and care sector [30, 31]. National eHealth solutions, including the SCR, are described as the "cornerstone of the digital interaction structure" and as essential for coherent health and care services [30]. The SCR is presented as an important part of the solution to fix the coordination problems described in the policy and strategic documents.

The red icon: a national alert system

Expectations of the SCR to function as a national alert system and potentially be lifesaving in emergencies, were described in the documents [8]. Furthermore, the documents indicate that the SCR will be an essential tool for HPs providing quick access to patients' critical health information, regardless of where the patient is receiving treatment. According to the practical user guide [27], HPs are expected to click on a SCR icon in their local EHR system to access the patient's SCR. This is the case in all health and care services that have implemented the SCR, and the SCR icon is identical in all EHR systems. The icon appears in colors blue or red. The SCR icon color is a symbol for alerting HPs if the patient has any critical information stored just by looking at the color of the SCR icon, before opening the SCR. If the icon is red, this signal that MDs have registered critical information about the patient (severe allergies, implants, special disorders), while a blue icon signals that the patient does not have any critical information registered in the SCR. Only MDs are allowed to enter critical information [27]. Citizens can also register certain information themselves, such as primary contact information, information about being an organ donor, disease history, or special needs in connection with diminished sight, hearing, or the need for a translator [8, 27].

The idea of a seamless information system

The document review revealed that the SCR's vision is that the HIS will compile current, trustworthy, essential information about patients available across institutional levels. The SCR was established to increase patient safety by giving HPs easy access to updated information such as medication lists, allergies, and other critical information [8, 24, 28]. The documents express an expectation that the SCR will increase patient safety, giving HPs updated information about the patient in acute situations. This includes the patient's medication list when the HPs lack up-to-date information about the patient in their local journal EHR systems [24, 27, 31]. The SCR is described as helping HPs gather information about the patient in one place, ensuring the HP does not waste time logging

into different systems. Furthermore, the SCR is expected to prevent the patient from repeating their medical history each time they meet a new HP [24]. According to the documents, most of the information in the SCR will automatically be extracted from national registers. This includes the prescription intermediary; contact information to the patient's next of kin (name, address, telephone numbers); the patient's GP; and admission history to the specialist health service [8].

The documents describe a health and care service that needs a national eHealth system as a solution to problems with coordination and information sharing. There is an expectation that the SCR will function as an alert system in an emergency setting and act as a "seamless system" of information sharing across the health and care services. These expectations and visions constitute the scenario the SCR is entering.

Findings from the analysis of observation and interview data

In this section, we present our analysis of HPs' negotiations and experiences in daily use of the SCR. Two main themes were developed through the analysis: *adapting to workflow* and *dealing with uncertainty* (see Table 2).

Adapting to workflow

In two of the sites where observations and interviews were conducted, the SCR was part of the MDs information-gathering routine when a new patient was admitted. MDs in the emergency unit checked the SCR on every patient and preferably before the medical examination of patients. MDs in the intermediate unit did not have the same routine or the need to check the SCR before examining every patient, as they often knew their patients from previous admissions.

When MDs gathered information about a patient, regardless of context, they often started in their local EHR system and read through the admission report. Then they checked the SCR by clicking on the icon of the SCR that is an integrated part of their local EHR. Typical information MDs gathered from the SCR included: critical information, whether the patient was married, had kids, the next of kin, the GP, age, and the pharmaceutical summary. We observed, and were told, that the MDs checked the SCR regardless of the SCR icon's color. As one MD in the intermediate unit said, "I would never trust that there wasn't any information there." If the MDs in the emergency unit did not have the chance to check the SCR before the patient's medical examination, they checked it as soon as possible. Their first priority was to check if the patient had any critical information, and the pharmaceutical summary was second. They often experienced that critical information was stored in their local EHR system and not in the SCR. Only a few MDs had ever registered critical information themselves in the patient's SCR. "I think doctors should register critical information more often, since I have experienced that the information has been useful," said one MD in the emergency unit. Some of the MDs reflected on the concept of "critical information" and how and by who such information should be registered.

The MDs in the emergency unit experienced that the SCR made a difference in emergencies by providing information about medical allergies and diagnoses of the patients. They also found it helpful when the patient was a tourist, since they had no previous information about the patient in their local EHR system. Through the SCR, the MDs could see where the patient has previously been admitted (hospitals), and they could contact that hospital. As one MD in the emergency unit said, "If a patient is unknown to us or unconscious, the SCR is the go-to."

For the nurses in the emergency unit, the SCR was not part of the information-gathering routine. The nurses occasionally used their local EHR, but they typically used the "folder," which was a physical paper folder containing the patient's ID band and ID tags, a paper manually filled out by nurses during the patient's examination, and a medication sheet manually filled out by MDs. The nurses explained that if they saw that the icon was red, they did not check the SCR themselves, rather they made sure to let the MD know.

The nurses in the intermediate unit had experienced that when patients were admitted from the hospital there was often a note from the hospital saying: "check the SCR." When the nurses checked, the SCR contained critical information about the patient. Hence, nurses at the intermediate unit found the information in the SCR valuable in emergencies. As a nurse expressed in an interview:

> *It was at night, and we received a patient from the emergency room. The patient did not have any papers from the emergency room. We had no information except the patient's name and social security number. We then admitted the patient to our local EHR system and got access to SCR through that. We then saw the necessary medical information until the doctor came the next day. SCR was the only place we could look for information because the patient had nothing with him but himself. –Nurse (intermediate unit)*

The SCR was part of the information-gathering routine for the MDs at the intermediate unit, but it had not become a routine for the nurses. The nurses in the intermediate unit felt that the hospital staff was unsure

whether the intermediate unit had routines for checking the SCR as a part of their information-gathering routines, since the hospital staff often explicitly wrote "check the SCR" in their discharge summaries.

The pharmaceutical summary was the primary use of the SCR for the MDs, and it could be time-consuming to gather information for the medication list to a patient.

> *I mostly use it (SCR) to check medicines. Many of our patients are quite sick and have a lot of medication, and they often don't know what they're taking themselves. If you tell them, some patients know the medicine's name, but if not, it can be quite hopeless. In that way, the SCR is helpful, so I don't know how we would have worked without it. It would have been cumbersome. –MD (emergency unit)*

Though MDs at the units involved in our study had adopted the SCR into their workflow, there were only a few nurses in the intermediate unit that used the SCR. The nurses and the physiotherapist in the service allocative unit, the home care service, and the emergency unit did not use the SCR. The reasons why these HPs did not use the SCR varied. Some did not know what the SCR was, and others did not know if they had access to it. Some had heard about SCR from their colleges. As a nurse in the intermediate unit said, "I have to admit, I don't really know what the SCR is." The HPs reflected on, both during the interviews and observations, the purpose of the SCR since they had already obtained the discharge report and medication list from elsewhere. These HPs had access to the SCR but described the SCR as a tool that the MDs used, and they did not find a reason why they had to use it as well. The HPs emphasized that they get their information elsewhere, like their local EHR system, and did not find the SCR as a useful source of information. "I've only looked at it, but I've had no need for it," said a physiotherapist in the service allocation unit.

During the observation study, a conversation about the SCR emerged, and some nurses started discussing the SCR. Primarily, the discussions centered on whether or not they had access. One of the nurses pointed out they had to have a chip in their id-card to put in the keyboard to access the SCR. During the conversation, several of the nurses expressed that they did not bother to go to the IT service, located in another building in the municipality, to get the chip in their id-card that was required before they could get access to the SCR.

Dealing with uncertainty

The time a HP spends on gathering information varies, and HP have several sources of information. Typical information sources include previously discharged reports, the SCR, their local EHR, the admission report, the patient itself, and next of kin. The high number of sources of information imply uncertainty could play out among HPs in cases where there is discrepancy between different sources.

> *There are so many places to gather information. There is double and triple and quadruple journaling. The medication list is enough to drive you crazy. There is one medication list written on paper in the hospital, one in the SCR, one in the general practitioner system, and one medication list in the system that the homecare nurses use. There can easily be five different places for a completely average old patient. When a patient goes back and forth from the hospital, there are often mistakes in the medication list. –MD (intermediate unit)*

Some HPs felt like the SCR was just another place they had to check when gathering information about a patient. The uncertainty that the HPs experienced was embedded in the complex system of multiple sources of information that they had to navigate through.

The MDs in the emergency and intermediate unit emphasized that the complete medication history in the SCR made a difference in obtaining a comprehensive picture of their patient's medical history. However, the pharmaceutical summary in the SCR also brought up uncertainty. Medication management was a primary concern and there was frustration around the uncertainty in the multiple lists. The MDs were frustrated over how time-consuming it was to ensure the medication list was current and correct. During the observational study, some MDs mentioned that it felt like they were detectives trying to get the right puzzle pieces to solve the "case" of getting the medication list up-to-date. The MDs had to use at least two or three sources in the medication reconciliation. The information sources are the patient, the next of kin, the home care service, the medication list from the hospital, previous discharge reports, information in their local EHR system, and the pharmaceutical summary in the SCR.

The MDs spent a lot of time on medication reconciliation. The uncertainty in the medication list could last for days. One MD in the intermediate unit expressed, "It can take several days to be sure that what is written there is correct." The MDs emphasized that there are too many sources of information in medication reconciliation, and the uncertainty plays out when different sources give different information about the patient's medications. If a patient was admitted from the home care services or nursing home, it was "common knowledge" among the HPs at the hospital that the pharmaceutical summary in the SCR would be incorrect.

What the patient physically consumes of medication is only known by the home care service, or the patient itself, the SCR can come close, and sometimes it is entirely identical. Sometimes there can be a discrepancy there as well. The home care service writes in their local EHR systems and not in SCR. We've only got one more place in a way, but it's a slightly better place than many of the others. –MD (intermediate unit)

According to the MDs, the updated and correct medication list would not be found in the SCR when a patient was admitted from a nursing home or had home care services. In such cases, they depended on receiving the medication list or an admission report from the nursing home or home care service. They expressed that getting an overview of the patient's medication use was complex.

Though the information is automatically extracted from national registers, HPs don't necessarily trust the information relayed through the SCR. When a MD is new in the emergency unit, they offer a training course that includes using the SCR. During this training course, the MDs "were told that they can't trust the medication list in the SCR if the home care service controls the medications to the patients" said one MD at the emergency unit. In these cases, they were encouraged to contact the home care services by telephone.

The idea behind the SCR is that one gathers information from various health organizations and also towards general practitioners, home care services, and nursing homes is very good, but not optimal. There are several pitfalls, meaning you must take it with a pinch of salt. One cannot blindly trust the SCR. –MD (emergency unit)

The MDs had other sources of information they trusted more than the SCR, such as the information in their local EHR system, the admission report, previous discharge reports and spoken information from home care nurses.

Trust-work

To summarize our findings, the HPs experienced uncertainties and altered workflows in the wake of the implementation of the SCR. How HPs dealt with these challenges in their daily work, and these new ways of working have been interpreted as a kind of trust-work. Trust-work can be understood as a way of dealing with uncertainty, in line with other researchers who see trust in relation to uncertainty and risk [32].

Discussion

The purpose of this study was to gain better understanding of the visions and expectations of the SCR and of how HPs descript and rescript the SCR in their daily professional life.

The policy and strategic documents show the visions and expectations of the scenario for the SCR, and the practical user guides gives us information on the designer's user manual: the script of the SCR. The political goal of the SCR is a solution to solve the problems of information sharing faced by the health and care service. In the daily workflows of Norwegian health care institutions, the SCR is considered just another tool for information gathering; however, it needs to be checked and validated by human actors, hence creating more work.

Considering our findings from the empirical study, we have observed an assumption that is only slightly mentioned: information sharing requires that HPs who use the information have a high degree of trust in the information being shared. In the consultation note establishing the national SCR [28], the focus is on the MDs lack of trust in the pharmaceutical summary [28]. The document Roadmap for development and implementation of national eHealth solutions [30] mentions that shared information must be up-to-date and complete as well as the possibilities for establishing a trust model for data and document sharing regarding access control to which HPs gets access to patient health information across different levels in the health and care service [30].

HPs are critically evaluating information and it is a core aspect of HPs practice. This aspect is not problematized through the documents, but we argue it is an underlying assumption. Trust in others to interpret the information gathered from technology is essential for high-quality care [33]. The vision of the SCRs script can only work if all users trust all the actors involved, both people and the technology. For the SCR to function as planned, HPs who enter information in the SCR must trust that those who retrieve the information understand and interpret the information correctly. In addition, HPs must also have confidence in the system that makes the information available to those who need it. The HPs who retrieve information must, in turn, have confidence that those who entered the information are competent and that the system can be trusted, continuously updated, and the information always available. This assumption of complete trust in other actors is not explicitly described in the SCR vision but lies as an unspoken premise. Our analysis shows that this becomes problematic when HPs rescript the SCR. HPs do not entirely trust shared information. On the contrary, HPs include critical assessment of information in all stages of their work. Previous studies on using eHealth system found that HPs have more

trust in shared information if they receive information from colleagues they already know [34]. The information being shared in the SCR is not necessarily entered by colleagues that the HPs know.

Our findings showed that the SCR was scripted as an alert system for HPs by the SCR having a symbolic color system. However, the alert system had little to no function for the HPs. We found that HPs checked the SCR regardless of the symbolic color because they did not trust it. Our findings are consistent with other Norwegian studies, that MDs do not trust the coloring system of the SCR and that "a blue icon did not equal a lack of critical information" (12, p.8). Our findings indicate that MDs, in spite of frequent use, did not trust the pharmaceutical summary entirely. Rather, they experienced it could raise more questions than answers when the MDs were trying to update the medication list, and it led to additional work.

Though the SCR's vision and scripting express expectations that it should provide easy access to updated information gathered in one place, the HPs experiences were ambivalent. The SCR held a dual role for MDs, as it could ease the information gathering, but also complicate and introduce more uncertainties. This does not mean that the national eHealth system SCR does not have a function or is considered useless. The SCR contributes to getting patient information out of the siloed system, as intended. HPs find that the information in the SCR has made a difference.

The SCR has a strong script: the information is mainly automatically updated, and there is little room for free text. This gives HPs little room for flexibility in using the SCR. Our findings reveal challenging aspects of the vision of seamless shared information within the SCR. Based in our findings, we claim that a seamless information system [35] may be impossible to achieve due to HPs constant and ongoing trust-work in their everyday practice. In an already complex system of information, the SCR holds a dual role; it is a valuable source of information gathering but simultaneously an add-on; a new source of uncertainty. HPs must always filter and distil as much information as they can for every patient they meet. The ongoing trust-work includes constant critical assessment of any information they gather about a patient. This is a core aspect of a HPs work. In our study, the HPs were constantly checking the SCR, regardless of the symbolic color system, and integrating this checking in the totality of the information trust-work that they do every day. In their ongoing trust-work, HPs will relate to multiple other HPs and other sources of information. They will ask for confirmation and assess information all the time. Vos et al. [36] suggest that HPs must develop multifaceted trust for a more coordinated and collaborative use of the EHR system. To achieve multifaced trust, "health professionals need to be able to retrieve, understand and trust each other's information" (36, p.10). Trust involves assessing not only patient information but also the sender of the information and the SCR as a HIS. Trust in HISs, like trust in other humans and other written sources, will, and should, never be unconditional.

On the contrary, our health care system relies on HPs continuous critical assessment of information, the sources of information, and the systems containing the information. This trust-work will always be an integral part of any HPs workflow. Expectations of shared information systems to reduce the uncertainty HPs face when in front of a new patient must take this into consideration. Information trust-work is, and must be, at the core of HP performance. HIS can facilitate but never replace the critical assessment of information that all HPs need to perform when treating a patient. We argue that critical trust-work is an essential and integral part of all HP practice. Regardless of the quality, size, and design of HISs that share patient information, there might always be issues related to HPs ability to trust the information in the systems. Indeed, assessing and double-checking information is part of health professionalism. Hence, the expectations of the system to solve the problem of coordination and information sharing, to function as a perfect alarm system, and to work seamlessly might never be met. However, this does not mean that national eHealth systems cannot improve healthcare quality. They will, or are, to some extent, already good enough to be a viable part of the provision of healthcare service communication. Still, as our study highlights, future scenarios should include expectations of trust-work related to national HIS and not overlook this core aspect of high-quality professional healthcare.

Limitation

Some limitations should be acknowledged in this study that could have affected the interpretation of the results. One researcher conducted all the individual interviews, participant observation, and the empirical inductive coding alone. A methodological strength could have been if a second researcher had done some of the data collection or coded the empirical data. However, the research team had regular meetings where the grouping of codes and the analysis were thoroughly discussed between the authors. The researcher producing the data was new to health care settings when entering the field, and this qualitative fieldwork can thus be described as a study in an unfamiliar culture; the internal terminology was hard to understand since the HPs used internal jargon and foreign words [25]. This can be seen as a limitation but

also a strength since it allowed the researcher to ask open questions and maybe see situations differently than the HPs, as in our analysis where the HPs trust-work became important.

The data collection was conducted during COVID-19, which affected the participant observation since the researcher had to keep a two-meter distance from HPs. This affected where and how the participant observation could be carried out in the home care service, the intermediate unit, and the emergency unit. There was not always enough room for the researcher to observe; therefore, the researcher had to adjust where the observation could happen in the different units. Due the COVID-19, two individual interviews had to be conducted over the phone. Phone interviews have limitations since we could not see each other's facial expressions and body language.

The document review was a small part of the data collection compared to the participant observation and individual interviews. Other policy documents, Official Norwegian Reports, or other practical documents could have been included in the document review. Still, the selection of which documents were included was narrowed down due to limitations in the scope of the research project. A limitation of the document review was that it was carried out with the lens of searching for future scenarios and explicit and implicit visions about the SCR; this can be a limitation since the researchers searched explicitly through the lens and, therefore, lacked the overall nuanced perspective.

Conclusion

This study has explored the visions and expectations that constitute the scenario for the national eHealth system SCR through a document review and studied how HPs descript and rescript the SCR in their everyday work. While the visions and expectations of the national eHealth system SCR assume that HPs will unconditionally trust the system and the information shared, we found that this is not the case. Our study illuminate how the SCR script is de-scripted and re-scripted in ways that demand of human actors, HPs, to double check the trustworthiness of SCR information in various ways. Through the de-scripting and re-scripting of the SCR, HPs include new tasks of critical assessment of information from the SCR in all stages of their work. Sharing patient information through technology requires trust-work by the HPs, especially when the information is being shared with HPs outside the institutions from which the patient information originates. Our study thus implies that trust-work deserves more attention in the interdisciplinary field of eHealth, especially regarding technology that enables shared patient information.

Abbreviations

HIS	Health information system
HP	Health professional
SCR	Summary Care Record
EHR	Electronic health record
MD	Medical doctor
STS	Science and technology studies
SDI	Stepwisedeductive induction analysis
GP	General practitioner

Supplementary Information

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Supplementary Material 1.

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Authors' contributions

KL: conceptualization, methodology, formal analysis, investigation, writing original draft preparations. AF: conceptualization, methodology, analysis, review, editing and supervision. RS: conceptualization, methodology, analysis, review, editing and supervision. HKA: conceptualization, methodology, analysis, review, editing and supervision. All authors have read and agreed to the published version of the manuscript.

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Availability of data and materials

The datasets generated during and/or analysed during the current study are not publicly available due to ethical restrictions regarding data protection issues and the study-specific consent text and procedure, but anonymized data are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The Regional Committee for Medical and Health Research Ethics approved the exemption from the duty of confidentiality (Ref: 141144), and the Norwegian Center for Research Data (Ref: 919576) approved the study before the beginning of the data collection process. The health and welfare director in the municipality approved that the municipality could participate in the research project. After approval, they facilitated contact between the researcher and the different units. The units were contacted, informed about the study, and decided whether to participate. The hospital's head of emergency medical care was contacted and informed about the study and approved participation. The study is registered at the data protection supervisor at the hospital. All methods were carried out in accordance with relevant guidelines and the declaration of Helsinki. Written informed consent was obtained from all the participants. The participants were informed of their right to withdraw from the study without stating a reason. They were assured that confidentiality would be maintained concerning the transcribed data (anonymized systematically) and in any publications resulting from the study. All the participants were asked to participate and informed about the research project by the first author, and they all agreed to audio-record the individual interviews.

Consent for publication

Not applicable.

Competing interests
The authors declare no competing interests.

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