Can Increased Patient Involvement Reduce the Number of Surgery Cancellations?

Lessons learned from a research and development project in Norway

Kari Dyb, Conceição Granja
Norwegian Centre for E-health Research
Tromsø, Norway
e-mail: {kari.dyb, conceicao.granja}@ehealthresearch.no

Abstract—**Increased patient involvement is the new mantra in modern healthcare, indicating that patients can play an important role in improving the quality of their health and care services. In this paper, we study the reality of increased patient involvement within the current organizational structure of hospitals by revisiting the findings from a recent research and development project at a university hospital in Norway. Through the development and implementation of a tool for electronic two-way communication between patients and hospitals, the overarching goal of the eTeam-Surgery project (2013–2019) was to better prepare the hospital and the patient for surgical procedures and thereby reduce the number of surgery cancellations. To approach this goal, researchers from the field of health informatics, medicine and sociology explored a quality improvement initiative at the hospital, made field observations and interviewed patients and health professionals. eTeam-Surgery demonstrated that establishing a tool for active involvement of patients in the pre-operative planning process was not an easy task. The research revealed (1) diverse reasons for surgery cancellations, (2) a lack of uniformity in the pre-operative workflow and (3) a hospital practice of marking a surgery as cancelled when patients tried to rebook for a different date. Focusing on increased patient involvement, this paper demonstrates how the main reasons for cancellation at the hospital and the lack of uniformity of the pre-operative workflow both originate from hospital organizational issues and, consequently, will not be solved with increased patient involvement. On the other hand, increased patient involvement can improve the current hospital practice of marking surgeries as cancellations when patients are actually trying to rebook. It is our conclusion that hospitals have a long way to go before the new mantra of active patient involvement can be a reality. However, we still believe that active patient involvement can positively contribute to the problem of elective surgery cancellation. The first step would be for hospitals to offer patients the option of choosing their own date of surgery, similar to booking an airline ticket online.**

Keywords-elective surgery; e-health; cancellations; planning; increased patient involvement.

I. INTRODUCTION

Increased patient involvement is the new mantra in modern health and care services, indicating that patients can play an important role in improving the quality of care by becoming actively involved in their own health [1]. Empowering patients to take an active role in their own health has been nationally and internationally identified as a key initiative to improve health and care services [2][3]. A number of trends and policy shifts can be identified that are promoting greater patient involvement in health and care delivery through consultations, treatments and continuous care [4].

Health Information Technology (health IT) is frequently used to increase patient involvement. In Norway, the Norwegian Ministry of Health and Care Services and the Directorate of eHealth have defined providing patients' digital access to important health information as one of the three main priorities areas for IT development and implementation [5][6]. Health IT is seen as an important tool to increase patient involvement and improve the quality of health and care services.

In this paper, we will study the reality of increased patient involvement in hospitals by answering the following research question: "Can increased patient involvement and digitalization reduce the number of elective surgery cancellations at the University Hospital in North Norway (UNN, from the Norwegian: Universitetssykehuset Nord-Norge)?" We approach the research question by revisiting the findings from a recent research and development project, the eTeam-Surgery (2013–2019) [7].

A. Elective surgery cancellations

For many patients, undergoing surgery is a major life event involving a high level of anxiety before admission to the hospital [8]-[11]. Surgery cancellations can be troublesome for both patients and their families [12][13]. Patients may also suffer psychological stress and/or financial hardships due to surgery cancellations [14]. Thus, for patients, cancellations are stressful and costly, with a high level of emotional involvement before surgery [15]. However, the research literature illustrates that surgical patients who adopt a more active role have a higher general patient satisfaction compared with patients who did not participate in decision making [16], including being involved in choosing the date of surgery [17].

Furthermore, in most hospitals, surgical departments are both a major area of investment and the greatest source of revenue [15][18]. Nonetheless, hospitals, in particularly public hospitals, regularly cancel elective surgeries, evidencing cancellation rates of 10–40% [10][11][15][19]. However, it has been shown that 50% of elective surgery cancellations might be avoided [14][15][20], and that patients can contribute to the reduction [17]. Avoidable cancellations include, for instance, cancellations due to lacking information; predominantly these were situations in which information

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existed prior to surgery but was not available when required [14][21]-[24].

At our site of research, UNN, 10% of elective surgeries are cancelled on the day of surgery, adding up to a total of 1847 cancellations per year [25]. In 2008, UNN reported that more than 50% of their elective surgery cancellations were related to inadequate pre-operative planning and that a substantial number of these cancellations could have been avoided [25].

B. The eTeam-Surgery project

The eTeam-Surgery project (2013–2019) was a research and development project at UNN funded by the Northern Norway Regional Health Authorities (Helse Nord). The project departed from the internal report and the dominant narrative among local health professionals at that time, revealing that a considerable number of the elective surgery cancellations at the hospital could relate to lacking information during the pre-operative planning process.

The health professionals described the lacking information as information that could affect the surgery, for example if the patients had a cold or other virus infections, allergies or chronic conditions; if they were taking pharmaceuticals; if they were prone to anaesthetic reactions; if they had surgery-related anxiety or distress and other reasons. The common reasoning at the hospital was that the patient could provide much of this information, and that cancellations could be avoided by simply asking the patient these questions.

By developing and implementing a new tool for electronic two-way communication between patients and hospitals, the overarching goal of the eTeam-Surgery project was to provide the lacking information and thereby better prepare the hospital and the patients for surgical procedures, hence reducing the number of elective surgery cancellations at the hospital.

To support the development of a technical prototype of a tool for two-way communication between surgical patients and health professionals, the project established an interdisciplinary research group. The research group consisted of a professor of medical informatics and three researchers from the field of health informatics, medicine and sociology.

To determine how part of the pre-operative planning could be moved from the hospital to the patient at home, through electronic collaboration prior to hospitalization, they studied the reported reasons for cancellations and the pre-operative planning processes at the hospital from technical, medical and organizational perspectives.

The interdisciplinary research group soon learned that creating tools for active patient involvement within the current hospital organizational structure for pre-operative planning was not an easy task. Therefore, a revisit of the empirical complexity and heterogeneity found in the eTeam project from an increased patient involvement focus is appropriate.

In this paper, two of the involved researchers approach the potential of increased patient involvement within the current organizational structure of hospitals by revisiting the findings from the eTeam-Surgery project.

This paper is divided in four sections. In the first section, we present the objective of the study, a brief review of the state of the art on elective surgery cancellations and the eTeam-Surgery project. Data collection methodologies, with which the results were obtained, are presented and explained in the second section. The results are disclosed and interpreted in section three. In the last section, we discuss the results and conclusions about the results are drawn, some indicators of future work in the area are foreseen.

II. METHODS

In the methods section, both the methods used in the eTeam-Surgery project and the methods used for revisiting these findings are described, focusing on the reality of increased patient involvement within a hospital context.

A. Quality improvement initiative

The management at UNN, our site of research, was determined to reduce the cancellation rate at the hospital. Therefore, in 2012, they allocated resources to a quality improvement initiative—that is, a Lean project for elective surgical patient pathways at the Operation and Intensive Care Clinic. Lean projects are commonly used to implement improvements in patient care in healthcare organizations through the development of a quality driven culture [26]. The aim of the quality improvement initiative at UNN was to determine new and effective surgical pathways by identifying and reducing waste in current practices.

Prior to the start of the eTeam-Surgery project, two members of the eTeam-Surgery research team followed the quality improvement initiative from the initial group meeting in April 2012. One had an active role and contributed as an anaesthesiologist in the quality improvement initiative. The other participated solely as a researcher by conducting observations during project meetings (2014–2015). In total, the two researchers observed and participated in more than 20 meetings.

One task of the quality improvement initiative was to identify the reasons for elective surgery cancellation. From the reasons reported in the Electronic Health Record (EHR), they identified 17 different reasons for elective surgery cancellation at UNN, illustrated in Figure 1 [19].

The data, as presented by the quality improvement initiative, shown in Figure 1, demonstrates 17 different reasons for elective surgery cancellations at UNN, and that insufficient surgery indication was believed to be the main reason for elective surgery cancellation at the hospital.

In this paper, we performed a thematic analysis of the data on the reasons for elective surgery cancellations. Focusing on increased patient involvement, we reanalysed, compared and translated the 17 different reasons for elective surgery cancellation, aiming for a new understanding of the reported reasons for surgery cancellations at the hospital.

B. Fieldwork at the hospital

In addition to following the quality improvement initiative, the eTeam-Surgery research group completed three weeks (approximately 100 hours) of fieldwork at UNN, mainly at the Operation and Intensive Care Clinic. During the fieldwork, the researchers conducted observations and unstructured interviews while following an anaesthesiologist and an anaesthetist nurse in their daily work. To complement the observations, the researchers interviewed 13 physicians,

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nurses and administrative personnel from four different surgical departments. They conducted the interviews at the workplace of the informants, and the interviews lasted between 30 and 60 minutes each.

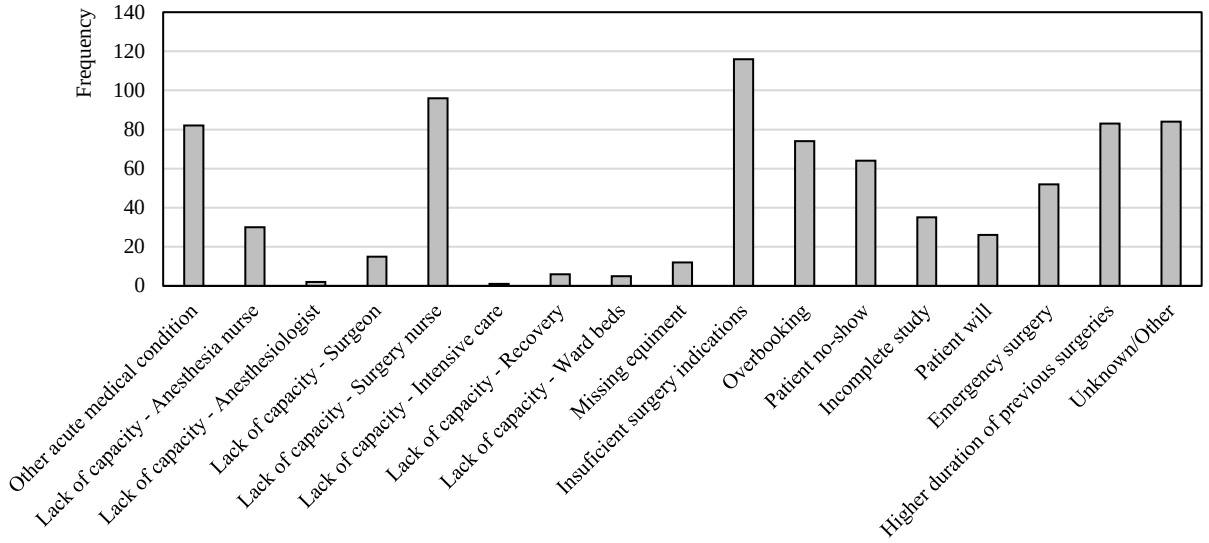

Figure 1. Reasons for day of surgery cancellations distribution at UNN from January to June 2011 [19].

The fieldwork demonstrated internal variation between the different departments in who plans the surgery and how and when the pre-operative planning takes place [27]. Additionally, it revealed how the different departments and, to some extent, even individual physicians, had developed their own local, pre-operative planning practice [28]. In some departments, senior surgeons did the pre-operative planning. In other departments, interdisciplinary teams involving senior and junior physicians, nurses and secretaries did the planning together. The data from the fieldwork demonstrated that in order to complete the daily schedule, health professionals used personal and empirical knowledge. These findings illustrate why the eTeam-Surgery research group could not describe a standard model of the pre-operative planning process needed for establishing two-way electronic communication between the hospital and the patient.

In this paper, we made a qualitative analysis of the challenges of the lack of standard pre-operative work practices, focusing on how increased patient involvement can influence the way that hospitals plan and organize elective surgeries. We reanalysed the heterogeneity of the workflow models, aiming for new knowledge on the patient role in the pre-operative planning process.

C. Patient interviews

The "Patient will" and "Patient no-show" categories (Figure 1) indicate that the responsibility for a significant amount of elective surgery cancellations at the hospital resided with the patients. In the Norwegian healthcare system, cancellations have consequences for patient priority in accessing surgery, hence, to cancel or not showing up for a surgery have direct consequences for the patient. Therefore, the research group approached the patients' perspectives on elective surgery cancellations.

To approach patients, a health professional at UNN assisted the researchers by identifying the patients who had cancelled an elective surgery within the last three weeks. To maintain patient anonymity, the health professional mailed letters of invitation to the identified patients, requesting their participation in the eTeam-Surgery project through qualitative telephone interviews.

Of the 48 letters of invitation, 11 patients stated that they were available for an interview. These 11 patients became informants in the eTeam-Surgery project. Prior to being enrolled as informants, they signed and returned the letter of consent and provided a telephone number for the researcher to contact them. One of the researchers called all the informants to make an appointment for the interview. The informants were adults ages 32 to 70 and included six men and five women. The phone interviews were structured and lasted 10 to 60 minutes each. At the beginning of each phone interview, the researcher introduced herself as a researcher in the field of e-health, with an interest in surgery cancellations. She emphasized that all information provided during the interview would be anonymized and that participation in the research project would not interfere, in any way, with current or future treatment at UNN or any other health or care institution.

After the introduction, the researcher communicated the data from UNN stating that the patient had cancelled an elective surgery at the hospital. She asked if this information was correct. If verified, the researcher asked why the patient had cancelled the surgery. If the patient contradicted the information, she asked the patient to tell his/her story about the situation.

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The admittance letter is the first piece of information that patients receive from the hospital regarding their surgery, and it already has a fixed date for surgery. The interviews revealed that these patients had called the hospital to reschedule the date of surgery immediately after receiving the admittance letter. For the informants, the surgery date provided by the hospital was inconvenient and ill-timed for them or their families. The data from the patient interviews illustrates that, contrary to the hospital's assumption, these patients wanted their surgery. The findings demonstrate that surgeries are cancelled when patients try to rebook. This is a situation that the patients described as frustrating, outdated and not appropriate for the digital era. The eTeam-Surgery project revealed that the patient-reported reasons for surgery cancellations did not correspond with the hospital's representation of the same problem [29].

In this paper, we revisit the findings from the patient interviews, by conducting a thematic analysis focusing on the patients' representation of increased patient involvement in pre-operative planning at the hospital. We reanalysed the patients' reports to gather new, in-depth knowledge on the patients' expectations to be involved in the decision of the date of surgery.

III. RESULTS

In this section, we present new knowledge on increased patient involvement and digitalization.

A. Quality improvement initiative

Focusing on the potential of increased patient involvement in the pre-operative planning process at UNN, the 17 different reasons for elective surgery cancellation were reanalysed, compared and translated. This analysis revealed four new general categories for the reasons for elective surgery cancellations:

1) Maladjusted resource planning, 67%
2) Patient will and no-show, 12%
3) Other, 11%
4) Medical, 10%

The first category, "Maladjusted resource planning", comprises 11 of the original categories and refers to cancellations due to a lack of available nurses or doctors, theatres, ward beds or equipment; overbooking; and that the provisos surgery had a higher duration than expected, and that there were not enough time for the next (longer duration of previous surgery). This category presents itself as the main reason for elective surgery cancellation (67%) and relates to maladjusted resources planning within the hospital.

The second category, "Patient will and no-show" (12%), comprises two of the original categories and refers to surgery cancellations due to patient decisions. The category includes, inter alia, the surgeries patients cancel themselves, and when the patient does not show up for an elective surgery at the hospital.

The quality improvement initiative used the category "Unknown/Other" (11%) when the reason for cancellation was not documented in the system or not available for selection in the system. This category was directly transferred into the new categorization.

The fourth category, "Medical", constitutes 10% of all surgery cancellations. It refers to cancellations due to medical issues with the patient such as insufficient surgery indications and other acute medical conditions.

The revisit demonstrates that the main reasons for surgery cancellation at UNN is maladjusted resource planning (67%).

B. Fieldwork at the hospital

The re-analysis of the workflow models at the hospital explored the potential of increased patient involvement in the existing pre-operative workflows at the hospital. It exposed a very low level of formal structure of the pre-operative planning process at UNN, hindering any attempts of re-engineering the workflow models to include a patient focus. Even when attempting to build a workflow model that only included activities involving the patient, we still found variation and heterogeneity, both at the department and individual level. The reality of the situation was illustrated in the observations and interviews completed during the fieldwork:

1) the patient data requested by the hospital, prior to surgery, differed between departments;
2) if data were returned by the patients (by the postal system) to the hospital, it had different meanings for different departments and individuals; and
3) different individuals within the same department interacted with the patient in different moments of the pre-operative planning process.

The revisit revealed that increased patient involvement is severally limited by the lack of uniformity of the pre-operative planning process at UNN.

C. Patients interviews

Revisiting the patient interviews demonstrated that patients wanted to be involved in choosing the date of their own surgery. The patient reports mentioned that

1) they were assigned a date of surgery without being involved or asked their availability;
2) the surgery was cancelled when they tried to reschedule it to another day (in the Norwegian healthcare system, cancellations have consequences for patient priority in accessing surgery); and
3) some patients expressed their wish to be digitally involved in deciding the date of surgery.

The revisit illustrates that an improved scheduling system and increased patient involvement might contribute to the surgery cancellation problem at the hospital.

IV. DISCUSSION AND CONCLUSIONS

In this section, we will consider the reality of increased patient involvement in the current hospital practice of pre-operative planning at a university hospital in Norway. We will do so by answering the following research question:

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"Can increased patient involvement and digitalization reduce the number of elective surgery cancellations at the University Hospital in North Norway (UNN)?"

We have addressed the research question by revisiting the findings from a research and innovation project, particularly suitable for embracing the complexity of increased patient involvement in a hospital context, the eTeam-Surgery project (2013–2019). The lesson learned from this project was that creating digital tools for two-way electronic communication between the hospital and the patient within the current hospital organizational structure for pre-operative planning is not an easy task. For example, the quality improvement initiative at the hospital identified 17 different reasons for elective surgery cancellation, the fieldwork at the hospital exposed the heterogeneity of the pre-operative planning process and the findings from patient interviews demonstrated that surgeries were cancelled when the patient was actually trying to rebook to a different date.

By revisiting these findings focusing on the potential of increased patient involvement, we demonstrate how 67% of elective surgery cancellations at UNN relate to maladjusted resource planning. Maladjusted resource planning is a reflection of internal hospital organizational issues and is not solvable with increased patient involvement.

The revisit also shows that, in 2016, the hospital had not adopted a formal pathway to support the pre-operative workflow. To the best of our knowledge, this is still the situation in 2019. Lack of a formal pathway of the pre-operative planning process means that in order to complete the daily schedule, health care workers rely on personal and empirical knowledge. Lack of structures in everyday planning practices relate to internal organizational issues and is not an ideal starting point for developing e-health interventions for increased patient involvement.

The patient interviews demonstrated that at UNN, elective surgeries were cancelled when patients were trying to rebook the date of their surgery. Despite growing recognition internationally that patients can help promote their own wellbeing, little evidence exists on how willing patients are to take on an active role. It is the authors' understanding that these surgical patients wanted increased involvement and that the cancellations were due to the hospital's poorly functioning scheduling system or lack of knowledge on how to operate the system, not because the patient did not want the surgery. The revisit illustrates that an improved scheduling system and increased patient involvement might reduce the surgery cancellation problem at the hospital.

Can increased patient involvement contribute to the reduction of surgery cancellations? Five years later, after revisiting the eTeam-Surgery project, we still believe that active patient involvement can help solve the elective surgery cancellation problem. However, as this paper demonstrates, in 2013-2019, the eTeam-Surgery project was ahead of its time. We are concerned that similar e-health interventions today might suffer from similar prematurity. To achieve patient involvement, the first step for hospitals might be to allow patients to schedule their own surgery date, in a similar way to how they book an airline ticket online.

It is our conclusion that increased patient involvement is wanted and needed, but hospitals, as organizations, are not ready for it yet. Hospitals have a long way to go before the new mantra of increased patient involvement is a useful asset in improving health and care services.

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