

Evaluation of a Telemedical-Based Care Pathway for Patients With COPD

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Abstract

This paper presents results from an evaluation of the care pathway for patients with COPD in the U4H project in Agder, Norway and may serve as a recommendation for future care pathways for COPD patients. Our evaluation was based on qualitative interviews and a review of key documents and research papers.

The care pathway included daily videoconference follow-ups for a period of 14 days, then a reduced follow-up for at least 16 more days. It contributed to increased accessibility, increased safety, and improved clinical insight for patients with COPD. However, we recommend a care pathway with room for more flexibility depending on individual needs, on the severity of COPD, and on what level of the services the patients already have. Patients should be able to be recruited from hospitals, home care services, and GPs. Video communication should be offered. Continuity in the follow-up is important for the sense of safety. The integration between specialist health care, home services, and GPs will become even more important in future telemedicine services as the number of patients increases.

Keywords

Care pathway, Telemedicine, COPD

1 INTRODUCTION

The proportion of elderly people in need of healthcare is increasing, and the prevalence of people suffering from chronic and long-term illnesses in different age-groups has been rising (Freid et al., 2012), and is likely to continue to rise with rising proportion of elderly. These trends will cause significantly increased pressure on society in terms of access to qualified health personnel (The Ministry of Health, 2009) and to financial resources (Nielsen et al., 2011). The planning and organization of health and social services must be rethought due to this challenge (Morris et al., 2006).

In Norway, better collaboration in the healthcare services, changes in the division of responsibilities between primary care and specialist health services, and innovation through utilizing technological solutions, such as ICT, telemedicine, and welfare technology, are suggested as measures for accessible, better, and more rational services (The Ministry of Health, 2011). This was the basis for the implementation of the Collaboration Reform in 2012 (The Ministry of Health, 2009), and based on this reform, major changes in the Norwegian healthcare services have been implemented. Patients are increasingly being followed up at a lower level of care than before and are transferred to the municipal health service more rapidly post treatment in the specialist health service, a change that requires well-functioning collaborative chains (The Ministry of Health, 2009). However, in line with increasing specialization, the healthcare services have become more and more

fragmented, resulting in a lack of continuity in the follow-up of older adults and of patients with chronic disorders (Coleman and Berenson, 2004; Stange, 2009). In addition, introducing clinical guidelines into routine daily practice often implies major difficulties, and as a result, many patients do not receive appropriate care (Paulsen et al., 2013). One potential tool to facilitate the implementation of evidence into practice is by implementing a care pathway. Care pathways are defined as “a complex intervention for the mutual decision making and organization of predictable care for a well-defined group of patients during a well-defined period” [9]. However, one of the major challenges associated with establishing care pathways is to ensure good interaction between the specialist health services and primary healthcare, for example in connection with patient discharge from hospitals (Paulsen et al., 2013). Therefore, in recent years, special attention has been focused on integrated care by developing care pathways involving both specialist healthcare and primary care (Smith et al., 2007; Sunde et al., 2014). Most of these care pathways are made for specific chronic diseases (Smith, 2012; Vanhaecht et al., 2016).

Chronic Obstructive Pulmonary Disease (COPD) is a chronic life-threatening disease, and patients with severe COPD typically need repeated hospital treatment (Vestbo et al. 2013). About 1 in 4 patients who are prone to COPD deterioration will be readmitted within the first 30 days after discharge (The ministry of Health, 2006). Hence, there is a need for further follow-up for many patients

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when they are discharged from the hospital. In this regard, self-management strategies and care pathways have been developed for patients with COPD (Vanhaecht et al., 2016). In addition, to improve the efficiency of healthcare services, attempts have been made to provide follow-up for certain groups of patients with chronic disorders through telemedicine (Henderson et al., 2013), where especially many have focused on care pathways for patients with COPD (Pinnock et al., 2013).

Traditionally, both care pathways and telemedicine services have been offered by the specialist health service, but as municipalities have taken over much of the follow-up of patients with chronic disorders, it has become more relevant for municipalities to take these initiatives (Røsstad et al., 2013).

A care pathway for patients with COPD, which included telemedicine services and that would work across levels of management, was established in the Agder region in Southern Norway as part of the European project United4Health (U4H). (<http://www.united4health.no/>). The project started in 2012 and ended in 2015. The telemedicine service was established as a municipal service (Gallefoss et al., 2012), whereas in other regions in the project, this was a service organized under the hospitals (Kidholm, 2016). Three telemedicine centrals (TMCs) were established; each intended to cover a group of surrounding municipalities. The purpose with this paper is to present the results from an evaluation of the care pathway for patients with COPD established in Agder for the U4H project, which may serve as a recommendation for future care pathways for patients with COPD.

2 METHODS

2.1 Design

We used a qualitative research approach, which is well suited to study problems that cannot be explored in isolation from their human and social context (Creswell, 2013). Case studies facilitate the investigation of a phenomenon within its social context, in its natural setting (Yin, 2014). Because of the exploratory nature of the research, we used an exploratory approach with qualitative interviews and a review of key documents in our evaluation.

2.2 Setting of the case

The case was carried out as a project in a region in southern Norway and involved two TMCs. The centrals were open Monday to Saturday during the daytime, staffed with one nurse each, all the time. Some of the nurses had additional tasks for other departments, and in short periods some nurses from other departments would step in.

The staff at the two TMCs communicated with the patients, and hence needed to access medical information about them and to communicate with the specialist health service. Patients had at their disposal tablets with

measuring equipment (pulse oximeter) and an online self-reporting tool. The measuring equipment transmitted measurement values wirelessly to the tablet, before being transferred from the tablet to the TMC.

Description of the care pathway

Patients with COPD were included in the project as they were discharged from hospitalization due to exacerbations. With a few exceptions, they received equipment and training at the hospital.

From October 2015 and onwards, patients could also be recruited by the municipalities. Patients recruited and included from the municipalities were given equipment and received training from the staff at the TMC.

The new routines were intended to contribute to a comprehensive care pathway. The GP continued to have the main responsibility for patients while they received telemedicine services. The nurses could obtain advice from the GP and from the municipality's home care services, and they could send information back. The specialist health service could be consulted via a separate electronic health record (EHR) system, developed for this project, where both nurses at the TMC and at the hospital had access.

At the start of the telemedicine follow-up, an intake interview was conducted to establish contact with the patient. An e-message was then sent to the GP with information about the enrolment. From then onwards, daily talks were conducted for 14 days. During these talks, staff from the TMC went through a questionnaire based on a checklist and reviewed the patients' measurements and their self-registration of health status. The checklist contained topics like smoking cessation, nutrition, and physical activity. After 14 days, the nurses would generally suggest reduced monitoring, and a new e-message with information was sent to the GP. Reduced follow-up implied continuing daily measurements and self-registration of health status, which were transferred to the TMC and controlled by a nurse. If necessary, a nurse would call the patient. In addition, the patient could contact the TMC if they felt the need. The patients completed a more comprehensive form (CAT - COPD Assessment Test) twice; this served as a mapping of their quality of life. After 30 days, the nurses reassessed the patients' status after a talk with them. Another e-message was sent to the GPs to allow input from them, before deciding whether to end the already reduced monitoring. In some cases, patients wanted to continue, and some were allowed to continue with daily measurements and self-registration for several more days before handing in the tablets. After submitting the tablets, patients could call the TMC when needed.

In addition to sending e-messages to the GP, the routines indicated that an e-message should be sent to the Health and Care Service Office and to the Home Care Services in the patients' home municipality at start-up, after 14 days, and at the end of TM treatment. The care pathway indicated that a "security card" should be established in

the home municipality's EHR for service recipients who had not previously received municipal healthcare services. This was done to register the patients as a recipient of telemedicine services.

Technology support

The nurses at the TMCs had three computers with monitors: a screen with a web camera and a headset for video conferencing, a screen with access to the municipal EHR (only possible for patients from the host municipality), and a screen with access to the EHR system that was shared with the specialist healthcare service. Thus, the nurses had to log on to two different systems on two different screens for each patient, and they had to communicate with the patient via a third screen.

The nurses had a decision support tool in the form of a "triage system," which was based on patients' measurements and self-registration of their health status. The results of pulse and oxygen saturation and the self-assessment formed the basis for a color-coded score. A green score indicated no need for action, a yellow score indicated a need for follow-up of a nurse within one hour, and a red score implied immediate follow-up / ingestion, and possible contact with a physician. If a patient had a yellow score for two consecutive days, a red score was shown.

2.3 Data collection

Five interviews of stakeholders involved in the establishment and implementation of the new service were carried out. We interviewed a counselor responsible for communication with GPs in the municipality concerning the role of the GPs in U4H, a project manager/employee in one of the municipalities concerning the start of the project, a home nurse with special responsibility for following up with patients with COPD concerning the involvement of home nursing services, and two nurses about their work in the TMC. The interviews were all semi-structured, and the questions were tailored to the interviewees (e.g., asking about their experiences carrying out their specific tasks). We taped three of the interviews, and notes were taken for all. The interviews lasted from 30–40 minutes each.

In addition, we carried out a review of notes and reports describing the care pathway (Gallefoss et al, 2012; Dagsvik and Ås, 2016; Kidholm, 2016; Vassbø, 2016). The results from several master's theses (Gundersen et al., 2016; Bårdsen, 2015; Moløkken, 2015; Urving, 2015) and from two research papers were also included in the evaluation (Barken et al., 2017; Vatnøy et al., 2017).

The project was approved by the Regional Committee for Medical Research Ethics ref. 2013/2115, but was considered outside of REK's mandate according to the Health Research Act. It was approved by the Norwegian Social Science Data Services, ref. 41549.

3 RESULTS

Our assessment shows that the service and the telemedicine treatment process in the United4Health (U4H) project have had several positive effects.

Most patients were pleased with the follow-up and believed that it contributed to increased accessibility, increased safety, and improved clinical insight. Good accessibility to healthcare professionals was important in the periods when patients experienced deterioration, especially patients with anxiety.

At the start of this project, only the hospital recruited patients. However, both the municipalities and the doctors wanted to recruit patients. When recruiting, it was important to ensure that patients knew what they possibly said no to. The training had to be good, so the patients understood why and how they should participate. Many of the COPD patients were so fatigued that it required a great deal of energy to master modern technology.

Several of the informants noted in their interviews that the care pathway in our case study was not flexible enough. Not all patients needed follow-up every day and with the same intensity. Some only needed follow-up during periods when they were ill. By being followed-up every day, some experienced feeling pathologized through having too much focus on their health status. Too much of an emphasis on disease can reduce motivation and hope for recovery. Some patients expressed getting "too much" follow-up and having too many people to deal with. Flexibility in terms of the time of day was also important. Many patients with COPD have sleeping disturbance, and it may be difficult to have a daily video conference meeting early in the morning. This was, for some, a reason for refraining from participating in the project.

It was important for the staff at the TMC to help patients see and interpret their symptoms and to do what they could do to prevent deterioration. Our findings indicate that the checklists were a good starting point for the daily conversations. In addition, the triage system was useful to support their decisions, but not sufficient. The nurses had to search several sources to gain a more comprehensive picture of the patients' medical history and to make a final assessment of the situation in collaboration with the patients. However, a lack of integration between different IT systems was a key barrier for working effectively. The fact that some information was fragmented reinforced this.

Initially, good practices were established for information exchange between TMS, doctors, and service offices and the home care services; however, data from interviews indicate that routines were not followed in periods when temporary staff took over for permanent employees.

We found that information about telemedical monitoring should be repeated regularly to relevant partners as GPs, hospitals, and decision makers of healthcare services in municipalities. In addition, employees in the home care services that may be called to move out to patients who have an exacerbation must receive regular information

about when and how they can access the required patient information.

There are several conditions that should be present for the GPs to become engaged. There must be a large patient base, which makes it worthwhile to invest time and resources to establish new routines for follow-up. A combination of e-messages and video consultation will be a good basis for interactions between TMCs and general practitioners. Co-operation meetings between TMCs and general practitioners should also be possible through video conferencing.

Technical problems were a significant challenge in the project. Good support was perceived as critical, as one-stop support, without too many healthcare professionals involved and having too many phones, as this tired the patient. Using video provided greater opportunities for assessing the patient's condition, while some patients were satisfied with only telephone contact.

4 DISCUSSION

In this case study, we have evaluated the care pathway for patients with COPD.

Our findings imply need for flexibility both in terms of frequency and form, including the time of day, and are in line with findings from previous studies (Hendy et al., 2012; Sunde et al., 2014; May et al., 2011). According to Hendy et al. (2012), the development of a remote care service cannot occur in a contextual vacuum treated as a prewrapped generic implementation package to be adapted later. Locally sensitive levers and incentives must be factored in and co-designed, both from inception and along the way. Interventions are needed that ensure user-centered rather than biomedical/service-centered models of care (Sunde et al., 2014). Hendy et al. concluded that the implementation of a complex innovation such as telemedicine requires it to organically evolve, be responsive and adaptable to the local healthcare system, and driven by front-line staff and management (Hendy et al., 2012). Flexibility in care pathways must be prioritized; Røsstad et al. (2013) found that disease-based care pathways for older patients are neither feasible nor sustainable in primary care and recommended a patient-centered care pathway.

Our findings imply that it is important to adjust the follow-up to individual needs. Follow-up should be organized so that one can easily regulate the frequency and the approach to following-up. This confirms May et al.'s previous findings, concluding that understanding the fit between everyday routines of the users and technologies in the home is essential for the uptake and use of technology (May et al., 2011). A more personalized and individual supervision, possibly with individualized content, can help the service to fit more patients. In addition, one should consider developing more checklists, both to be able to serve more diverse patient groups and as a quality assurance by having a documentation of the dialogue with the patients. With an understanding of the

content of the conversations and of the service, it is easier to fully know what works. Further, our findings clearly indicate that video communication should be offered. Pols (Pols, 2016) found that telemedicine technology did not put care at a distance, but rather in close proximity.

Our results imply that the hospital should continue to recruit patients as they discharge them. We find that, in addition, it is important that patient recruitment is available from home care services, which may potentially free up resources for these services. GPs can also identify and recruit patients who would otherwise have no healthcare. Seemungal and Wedzicha (2006) referred to a number of different studies, some of which have applied different forms of recruitment, but they did not find any correlation between recruitment and readmission rates.

We further found that continuity in the follow-up, when the patients met with the same nurse regularly, was important for their sense of safety. Oudshoorn pointed out that to know the patient as a person, including having knowledge about the disease, can provide valuable information about the patient's health status (2016). The nurses in our study had all undergone specific training and had several supporting technologies (checklist, triage system, and self-reporting from the patients). Horton underlined that nursing management in a telemedicine context requires new and advanced knowledge (Horton, 2008). We will argue that the competence at the TMC must be maintained when new employees start. If the target audience for telemedicine is expanded, employees must have a good insight into all relevant diseases, and there must be nurses with special expertise.

Integration between host communities, home services, and GPs will become even more important in future telemedicine services as the number of patients increases. It is especially important to ensure useful information exchange from the host municipalities to other municipalities they are covering.

There is also a need to be careful in the level of the service offering. According to May et al. (2011), telecare services may offer a cost-effective and safe form of care for some people living with chronic illness, but not for all. Hence; there is a need to assess cost-effectiveness before deciding on what level of service to offer to a patient.

5 IMPLICATIONS AND CONCLUSION

The care pathway applied in the U4H project contributed to increased accessibility, increased safety, and improved clinical insight for most of the patients. These were patients who had just been discharged from the hospital after a severe exacerbation. They were all followed up and could talk to a nurse daily, most over videoconference, for a limited period. In addition, they registered measurements daily, and hence could be contacted by the nurse after the initial period with daily talks. This implies that there is a need for a care pathway for this group with daily follow up and with daily talks with a nurse for a limited period, and the possibility of getting in touch with

the nurse beyond this initial period. However, the needs of the patients differ, and there is a definite need for flexibility in the care pathways. Based on our findings, we will propose a somewhat adjusted care pathway than the one applied, with room for more flexibility for individual needs. We will also propose that recruitment can be done by both specialist healthcare and primary care, including both GPs and home care services. However, it is still necessary to have a comprehensive recruitment and training process, especially for patients whose health condition is poor and with low technology experience.

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