

Interaction Between COPD Patients and Healthcare Professionals in a Cross-Sector Tele-Rehabilitation Programme

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Abstract. This paper explores how technology affects the interaction between chronic obstructive pulmonary disease (COPD) patients and healthcare professionals in a cross-sector tele-rehabilitation programme. The qualitative analysis has shown that a community of rehabilitation can be created despite the presence of long-distance technology. In the tele-rehabilitation programme, the interaction between the COPD patients at home and the healthcare professionals at the clinic has evolved with dialogue as the basis for mutual learning processes and new relationships. Managed properly, rehabilitation at a distance can be both effective and satisfying.

Keywords. Tele-rehabilitation, COPD patients, healthcare professionals, wireless technology, preventive integrated care

1. Introduction

In 2005, three million people died of chronic obstructive pulmonary disease (COPD), equivalent to 5% of all deaths globally that year [1]. Patients with severe and very severe COPD have a readmission rate of 63% during a mean follow-up of 1.1 year, with physical inactivity as the most significant predictor for readmission [2]. Those COPD patients with serious symptoms experience significant limitations in their everyday life, and the effect of medical treatment is limited. Many COPD patients must live with a reduced level of function, inactivity, frustration and social isolation. The issue, then, is to develop the most effective means of delivering and coordinating multidisciplinary care for COPD patients [3]. Reviews of non-telecommunications-based disease management programs for patients with COPD show these programs to be heterogeneous in terms of interventions, outcome measures and study design [4,5]. There is a need for more research on disease management programs for COPD patients that cross-cuts both primary and secondary care [6,7,8]. In the research and innovation project, called “Telehomecare, chronic patients and the integrated healthcare system” (the TELEKAT project), we have taken up the challenge of combining rehabilitation activities and use of new technology in order to develop a cross-sector tele-rehabilitation programme for COPD patients. The patients in focus are those with severe or very severe COPD. The aim of this paper is to explore how technology

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affects the interaction between COPD patients and healthcare professionals in a tele-rehabilitation programme.

Through user-driven innovation, the TELEKAT project has focused on developing a programme of tele-rehabilitation that can be carried out in the patient's own home in collaboration with various healthcare professionals. Rehabilitation, instead of being carried out at a clinic, can thus become a part of the patient's everyday life in the home environment. A telehealth monitor box is installed in the patient's home for four months. Based on wireless technology the telehealth monitor can collect and transmit data about the patient's blood pressure, pulse, weight, oxygen level and lung function to a web-based portal or to the patient's electronic health care record. Healthcare professionals, e.g., general practitioners (GP), district nurses, nurses, doctors and physiotherapists at the health care centre or hospital, can assess the patient's data, monitor the patient's disease and training inputs and provide advice to the patient. Patients and relatives can also view the data on the web portal and decide with whom they want to share their data (see figure 1).

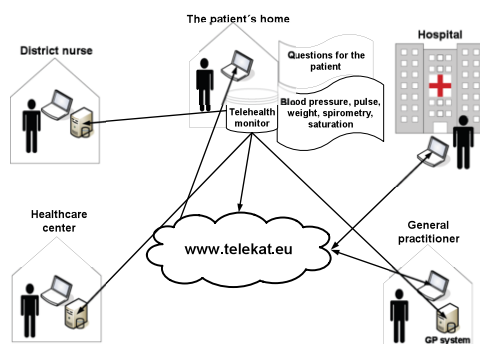


Figure 1. The TELEKAT programme for telerehabilitation

2. Theoretical Framework

This study is based on the notion of “communities of practice”, as inspired by the learning theorist Etienne Wenger [9]. Wenger defines “communities of practice” as groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. Wenger sees learning as a social practice centering around knowledge-sharing. Learning process is thus more than an individual cognitive process. Learning takes place in interaction with others, with whom one has a common interest. Hence, one becomes a part of a social learning process. Through the communities of practice, the participants realize that they gain more knowledge and understanding for the common interest. Over time and in sustained interaction, the participants develop a shared practice and repertoire of resources: they exchange experiences, stories, tools, and ways of addressing recurring problems. Participants will be involved in a set of relationships over time.

3. Methods

The case study method [10] is chosen as the overall research strategy for this study and serves as an explorative and in-depth study. A randomised study (n=111) has also been conducted. One group of COPD patients, called “intervention group” (n=57), received home monitoring using tele-rehabilitation technology. A second, control group (n=48) of patients followed the traditional rehabilitation programme. Clinical and economic data from the randomised study is not reported in this paper. Data collection techniques included: documentary materials, participant-observation inspired by Delamont [11] (total hours: 163 hours), qualitative interviews inspired by Kvale [12] with healthcare professionals, of which there were 6 GPs, 6 nurses and doctors at hospital, 6 nurses at the healthcare centre and 8 district nurses. Of the 57 COPD patients in the intervention group, 22 were interviewed three times while doing home monitoring. All the transcribed interviews were coded with Nvivo 8.0 software and analyzed and identified in steps inspired by Kvale (2009). The research process was carried out in dialogue with research colleagues. In order to optimize generalization of case studies, reference literature [13] recommends analytical generalization. In the TELEKAT project, analytical generalization has been applied by using a theoretical framework and a triangulation of data collection. Ethical approval was obtained from the local Ethics Committees.

4. Findings

The findings of how technology influences the interaction between COPD patients and healthcare professionals in a telerehabilitation programme are presented in terms of themes and examples in table 1.

Table 1. Themes of how technology influences the interaction between COPD patients and healthcare professionals

Themes	Examples
Mutual learning process	Healthcare professionals state that they learn more about COPD patients and rehabilitation in their everyday life.COPD patients state that they were able to integrate and maintain changes of lifestyle in their everyday life.
“Community of rehabilitation”	Healthcare professionals and COPD patients have developed a joint commitment and perception of telerehabilitation.
From authority to dialogue	Dialogue between hospital and patient (and family) breaches the healthcare professionals’ knowledge monopoly. Patients express the view that they have developed dialogue with the healthcare professionals on a more equal basis.
Technology as network creator	The design of the web portal makes it possible for the healthcare professionals, e.g., doctor at hospital, patients’ GP and the patients to be able to access the same data.
Technology as a pedagogical tool	Measured values that were accessible and visualised through graphics provide the patients with an overview of the development of their own symptoms.
Cared for and feeling secure	The COPD patients state that they feel cared for and secure in their interaction with the healthcare professionals.

Table 2 presents the baseline characteristics of the participants in the randomized study.

Table 2. Characteristics of interviewed COPD patients at baseline. The values are shown are the mean or median.

Variable	Telerehabilitation Group (n= 57)		Control Group (n= 48)	
	Male	Female	Male	Female
Number	23	34	22	26
Age (years)	69,6	67,2	70,6	59,9
FEV1 (liters)	1,10	0,75	1,16	0,74
Weight (kg)	79,61	67,53	79,56	60,67
BMI (kg/m ²)	25,74	25,31	26,8	22,76
Oxygen saturation (on air)	93,33	93,63	94,11	94,42
Blood pressure	137/79	136/82	136/80	132/77
Pulse	77	85	80	80
MRC dyspnoea score	3,5	3,64	3,6	4,00

5. Discussion

Based on a qualitative analysis, the interaction between COPD patients and healthcare professionals in the tele-rehabilitation programme can be characterized in terms of Wenger’s “community of rehabilitation”, linking COPD patients and healthcare professionals across sectors (see table 1). The characteristics of the interviewed COPD patients in the tele-rehabilitation group are representative compared to the control group (see table 2) in the TELEKAT study. The COPD patients expressed the view that their relationships with the healthcare professionals had developed from one of being subordinated to professional authority to a relationship of dialogue where the focus was on mutual learning. Observations showed that COPD patients tended to become more active as they participated in the programme. The rehabilitation process thus became a learning process. It was more than an individual cognitive process centered on the patient, since the learning was also distributed amongst healthcare professionals, the family and network of the COPD patients. Observations showed that the tele-rehabilitation programme created a bridge between the healthcare professionals’ domain and the patients’ home domain.

Moreover, the programme also challenged the traditional authority relationships and ways of interacting between professional healthcare practitioners and patients. This change in interaction between healthcare professionals and patients from an authoritarian relationship to a more egalitarian relationship based on dialogue between the parties has been seen in another study on home hospitalisation [7]. Equal dialogue not only enhances patients’ personal capacities to handle the consequences of living with the limitations of severe COPD. It also enhances the ability of healthcare professionals to provide treatment and to help patients regain some of their lost potential for staying active and avoiding rehospitalisation. Healthcare professionals and patients expressed the view that the design and function of the web portal promoted networking between the parties. Observations and the qualitative analysis showed that being able to see the measured and visualized values on the screen motivated the patients to involve themselves more deeply in their rehabilitation activities, giving them a better understanding of their own disease. This tendency has been seen in studies of home monitoring of other chronic diseases [14]. In the TELEKAT study, however, the patients articulated the view that they felt well cared for and were secure in the knowledge that the healthcare professionals were there for them “at the end of

the line". This made them feel more secure in carrying out the rehabilitation activities in their homes, despite the fact that no one was there to supervise them on the spot.

6. Conclusion

The qualitative analysis has shown that a community of rehabilitation can be created despite the presence of long-distance technology. In the tele-rehabilitation programme, the interaction between the COPD patients at home and the healthcare professionals at the clinic has evolved with dialogue as the basis for mutual learning processes and new relationships. Managed properly, rehabilitation at a distance can be both effective and satisfying.

Acknowledgements. The TELEKAT project is funded by the Program for User-driven Innovation, the Danish Enterprise and Construction Authority, Center for Healthcare Technology, Aalborg University, and by various clinical and industrial partners in Denmark. For further details, see www.telekat.eu.

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