Chapter 65
The Effects of Telehealth on Patients with Long-Term Conditions in Routine Healthcare Use and Lessons from Practical Application

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ABSTRACT

There is increasing uptake of telehealth for long-term conditions (LTCs). However, evidence of their effectiveness remains largely inconclusive. Similarly, success factors for implementation of telehealth into routine healthcare practice are not fully understood. The objectives of this chapter are to determine the effectiveness of telehealth; and to update existing checklist on key success factors for implementation of telehealth. Both randomized controlled trial (RCT) and observational study methods were used as case-studies. Analysis was carried out using logistic regression model and summary statistics. There was a statistically significant reduction in hospital admissions in favour of the intervention groups in the RCT, with an odds ratio (OR) of 0.08 (95% CI: 0.01, 0.81); p-value = 0.03, while in the observational study, the mean hospital admission per person reduced from 2.19 (95% CI: 1.67, 2.69) to 1.20 (95% CI: 0.88, 1.52); p-value 0.0004. Key success factors identified were used to update the second version of telehealth checklist tool. Telehealth was effective in reducing hospital admission in patients with COPD, heart failure, and diabetes. Key success factors were updated to support telehealth practitioners in embedding telehealth in routine practice.

INTRODUCTION

The past decade has seen an increase in telehealth activities, especially in the United Kingdom. Much of these increased activities was driven by the claim that telehealth is effective in reducing hospital activities and thereby reducing associated healthcare costs to health organisations (Audit Commission, 2004). However, it was unknown whether the above claim could translate in local settings in routine

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healthcare practice. In the United Kingdom, the Government supported a programme to promote piloting telehealth (as part of assistive technology) and many local authorities and healthcare organisations in England started to undertake telehealth activities from around 2006 onwards (Department of Health, 2005). Doncaster, one of the English districts, was one of the areas that managed to get initial Government grant to pilot the implementation of telehealth in 2007 and funding was subsequently met from the resource of Doncaster Primary Health Care Trust. The initial pilot was designed as a randomized controlled trial (RCT) to test the effectiveness of telehealth. After one year of the RCT, the telehealth project was transformed into a service development to all patients with long-term conditions (mainly patients with chronic obstructive pulmonary disease (COPD), heart failure and diabetes), with embedded service evaluation. The project was run by community nurses for patients living in their own homes. While this work was based in the community, it raised the need for interface between hospital and community services working together to coordinate and achieve optimum benefit for patients. This chapter reports on the findings of a local delivery of telehealth and the lessons learned in embedding telehealth in routine healthcare use, across community and hospital interface. The objectives were (1) to determine the effectiveness of telehealth; and (2) to report on updated key success factors that enable telehealth to embed in routine healthcare use.

BACKGROUND

Definition of Telehealth

The World Health Organisation (WHO) defined telehealth as:

The delivery of healthcare service, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of healthcare providers, all in the interest of advancing the health of individuals and their communities. (Scalvini, Vitacca, & Paletta, 2004; World Health Organisation, 2003)

While the above definition offers a broad base, and inclusivity, it also poses a problem in translating what is meant for the purpose of international comparison of evidence of effectiveness of telehealth. Telehealth has been used in the published literature to encompass a range of devices including: computer, videophone, still image video phones, mobile phone, fax radio, and the use of internet, among others (Grigsby, Brega, & Devore, 2005; Wootton, Dimmick, & Kvedar, 2006). It has been used for the management of a range of conditions such as mental health, heart failures, diabetes, lung diseases, as well as for public health interventions e.g. smoking cessation, and weight management programmes (Sheikh, McLean, Cresswell, Pagliari, Pappas, Car et al., 2011; Wootton, Craig, & Patterson, 2006).

Another issue that causes confusion among practitioners of telehealth is the lack of consensus on array of terminologies that are in common usage. Experts in the field of telehealth view telehealth as having different subsets, which overlaps with each other, and these include terminologies such as: telemedicine, mobile health (m-health), remote patient monitoring, mobile patient monitoring (Pawar, Jones, Van Beijnum, & Hermaens, 2012). On the other hand, telehealth itself is considered to be a subset of electronic health (e-health) (Pawar et al., 2012).

In view of the uncertainty in definitions in the published literature, it was felt necessary to define telehealth as used in this chapter:

Telehealth is defined as telecommunication device where patients can remotely monitor their vital signs (oxygen saturation level in their blood (SpO2), pulse, breathing, or blood pressure), and