



Cost-effectiveness of 'Program We Care' for patients with chronic obstructive pulmonary disease: A case-control study



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ABSTRACT

Objectives: To evaluate the effectiveness of a discharge program for patients with chronic obstructive pulmonary disease (COPD) patients on discharge from an emergency medical ward on discharge home rate, hospital length of stay (LOS), inpatient admission rate and cost.

Background: Frequent visits to the emergency department (ED) and subsequent hospital admission are common among patients with COPD, which adds a burden to ED and hospital care. A discharge program was implemented in an ED emergency medical ward. The program consisted of multidisciplinary care, discharge planning, discharge health education on disease management, and continued support from the community nursing services.

Methods: A retrospective case-control study was used. Data were retrieved and compared between 478 COPD program cases and 478 COPD non-program cases.

Results: No significant difference was found in age, gender, and triage category, LOS in ED, and readmission rate between the program and non-program groups. The program group demonstrated a significantly higher discharge home rate from the ED (33.89% vs. 20.08%) and fewer medical admissions (40.59% vs. 55.02%) compared with the non-program group, resulting in lower total medical costs after the program was implemented.

Conclusion: The program provides insight on the strategic planning for discharge care in a short stay unit of emergency department.

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1. Introduction

Chronic obstructive pulmonary disease (COPD) is a group of lung conditions characterized by progressive limitation of airflow; if wrongly diagnosed or inappropriately treated, it may progressively lead to death (Barnes, 2000; Halbert et al., 2006; World Health Organization 2015). The World Health Organization (WHO) reported that COPD is a common life-threatening lung diseases globally, with more than 3 million dying of COPD in 2012 (World Health

Organization 2015), and also the fifth leading cause of death in Hong Kong (Centre for Health Protection 2015). Of the estimated 7.3 billion people of the world, 10% of the aging population (over 60 years) suffers from COPD, and its prevalence continues to rise as the population of older people grows (World Health Organization 2015). Standard treatment involves the use of a bronchial dilator and prophylactic corticosteroid administered by inhalation; COPD patients are also encouraged to adopt a healthy lifestyle, with self health management and support from healthcare professionals (Barnes, 2000; Chan et al., 2011; Efraimsson et al., 2008; Global Initiative for Chronic Obstructive Lung Disease [GOLD], 2003; Halbert et al., 2006; World Health Organization, 2015).

Two recent systematic reviews of the innovations in clinical services for COPD are driven by two major components of interventions: (1) specialized discharge planning for coping in the community and

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home visits; and (2) delivery by nurses to support chronic care management. These interventions aim to improve the management of COPD as a chronic disease. Such interventions may be multidisciplinary but are commonly coordinated and delivered mostly by nurses (Candy et al., 2004; McMartin, 2013). However, most of the interventions are carried out in medical or geriatric wards on an in-patient basis or in community healthcare centers. None of them were carried out in emergency departments (EDs).

In Hong Kong, COPD patients with exacerbation usually receive initial care in EDs. The patients may be admitted to the medical ward for continued care after their condition has stabilized in EDs. However, the majority of the patients are normally discharged from ED for self-care management and attend their regular follow-up visits to the clinic (Chan et al., 2011). Inadequate self-health management is commonly observed among COPD patients with frequent acute exacerbation, ED visits, and hospital admissions (Chan et al., 2011; Efraimsson et al., 2008; GOLD, 2003; Halbert et al., 2006). One of the reasons may be insufficient patient knowledge of the action and side effects of their medication, leading to non-adherence or poor treatment compliance (Candy et al., 2004; Gallagher et al., 2011; McMartin, 2013). Patients with poor self-health management suffer from the vicious cycle of frequent acute exacerbations, discharges and readmissions to the ED, with or without hospital admission (Candy et al., 2004; Efraimsson et al., 2008; Gallagher et al., 2011; McMartin, 2013; World Health Organization, 2015). Readmission increases patient attendance in the ED and hospital admission rates, adding to the economic burden on the hospital and government (Halbert et al., 2006; World Health Organization, 2015).

As with other countries, such as the US, UK, and Australia, public hospital EDs in Hong Kong are under growing pressure because of the increasing demand for healthcare resulting from an aging population and the increasing expectations of patients for high-quality healthcare (Crawford et al., 2014; Forero et al., 2010; Halbert et al., 2006; Hoot and Aronsky, 2008; Somma et al., 2015; World Health Organization, 2015). Reducing the long waiting times and overcrowding in the ED is the main concern in ED management strategies (Crawford et al., 2014; Forero et al., 2010; Hospital Authority, 2008, 2010; Jayaprakash et al., 2009; Lo et al., 2014; Somma et al., 2015). The emergency medical ward (EMW), which is a short-stay unit, was launched in some EDs in Hong Kong in 2009 (Hospital Authority, 2008, 2010; Lo et al., 2014). In the study setting, a "Program We Care" (PWC) was set up in 2010 to provide seamless support for older patients with chronic disease. PWC has been a departmental quality improvement project that has been tailor-made for patients with chronic diseases, such as cardiovascular related disease, COPD and diabetic disease, who are ready for hospital discharge. PWC aims to provide high-quality multidisciplinary treatment and care by using a personalized discharge plan and a structured self-management educational intervention for every eligible patient. The care plan is driven by a departmental protocol, which was derived from international and local guidelines and evidence from literature review to suit the local setting and culture.

1.1. The study setting

The study setting is an EMW of a regional public acute care hospital with 583 beds. The EMW, a 26-bed short-stay unit, commenced full service in 2009. The main purposes of this EMW are to streamline continuing care for patients with sub-acute chronic disease and reduce the number of avoidable acute medical admissions. The regional hospital serves a population of 300,000 in a local district. According to internal ED statistics, an average of 380 patients per day attended the study ED in 2012, and the medical admission rate accounted for 41% of all emergency admissions from the attached ED. The overall inpatient bed occupancy rate reached 98.8% (Hospital Authority, 2010; Lo et al., 2014).

1.2. Intervention – PWC program for COPD patients

With this PWC, all COPD patients are treated in a timely manner in terms of multidisciplinary assessment, stabilization, and discharge within 2 days of admission. Health education on the nature of COPD, its medication regimen, and the importance of medication adherence and correct inhalation technique is provided face to face individually by the case nurse on discharge. Finally, an easy to follow educational leaflet on self-management of COPD is provided to patients. Then continued support such as weekly home visits with a physical assessment and medication monitoring was provided by the community nursing service. If a patient was discharged to a nursing home, then the patient would be cared for by the nursing staff with the support of the community geriatric multidisciplinary team service. This community geriatric multidisciplinary team service also conducts regular visits in nursing home. The continual support and close monitoring by community nursing service or community geriatric multidisciplinary team service have been highlighted (Hospital Authority, 2008, 2010; Lo et al., 2014).

2. Methods

2.1. Study aims and design

This research was designed as a retrospective case-control study. This study aimed to (i) evaluate the effectiveness of the PWC in terms of discharge home rate, inpatient admission rate, length of stay (LOS) in ED and hospitalization, and (ii) assess the overall cost-effectiveness of the program compared with the regimen before PWC came into operation.

2.2. Subject

The subjects in the case group were consecutive patients with COPD as medically diagnosed in ED records, who attended and received care in the ED, and were part of the program in the EMW. The data were retrieved from January to December 2012. The following matching and inclusion criteria were applied for the control group before the implementation of the PWC program: patients with COPD as medically diagnosed in ED records, who attended and received care in the ED, as well as those who matched the age (± 5 years), gender, and similar season (± 1 month) requirements, and did not receive care in the PWC. The exclusion criteria involved patients who had multiple health conditions during admission, such as surgical problems and neurological disorders, which affected their hospitalization period. The staff patient ratio, COPD care protocol and departmental policy were similar in both periods.

2.3. Data collection

Ethical approval had been obtained from the Clinical Research Ethics Committees of the university and the study hospital before the study. The anonymity of participants was maintained by using codes in data recording and reporting, and no individual participant was identifiable. Based on the exclusion and inclusion criteria, the ED records of 478 non-program COPD patients (as control) and 478 COPD on the PWC program in 2012 were retrieved and compared. Data were retrieved retrospectively through the clinical management system of the hospital. The costs of medical equipment, medical and general consumables were obtained from the procurement vouchers in the EMW. The expenditure on drugs was estimated from the hospital pharmacist's price list.

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