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Nationwide analysis of medical utilization in people with severe mental illness receiving home care case management

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ABSTRACT

Aim: This nationwide study investigated the change in medical utilization of psychiatric home care case management (CM).
Methods: This nationwide study enrolled patients receiving CM (N = 10,274) from January 1, 1999 to December 31, 2010, from Taiwan's National Health Insurance Research Database. Through a 2-year mirror-image comparison weighted by the contributed person-time for each subject, we evaluated changes in medical utilization. Furthermore, a case-crossover analysis was used to verify the independent effect of CM in changing medical utilization by adjusting the time-variant variables between the pre-2-year (within 2 years before receiving CM) and post-2-year (within years after receiving CM) periods. The same methodology was applied for the subsequent 2-year comparison to assess the maintenance effect.
Results: Of the 10,274 patients receiving CM, 69.7% had schizophrenia. The results showed a chronological trend for the intervention of CM. The adjusted mirror-image analysis revealed a significant decrement of psychiatric and involuntary admissions after the intervention, and the utilization shifted toward psychiatric outpatient service. The case-crossover analysis with the adjustment of time-variant covariates confirmed the independent effect of CM on the changes of medical utilization. The comparable effect persisted after the next 2 years of intervention. However, CM showed no impact on lowering the admission rate for comorbid physical illnesses after the intervention.
Conclusions: The CM model can effectively reduce psychiatric hospitalization and involuntary admission frequency but has no effect on comorbid physical illnesses. Care models aimed at ameliorating physical problems in such patients are needed.

1. Introduction

People with severe mental disorders often experience a chronic course that greatly affects their quality of life and require repeated hospitalizations (Patel et al., 2016). Due to the prolonged nature of their condition, long-term treatment is usually appropriate. Even the deinstitutionalization policies of the 1960s decreasing long-term hospitalization and mortality rates in psychiatric patients have not satisfactorily narrowed the gap of mortality between psychiatric patients and the general population (Nordentoft et al., 2013; Wahlbeck et al., 2011). This situation is reflected by the increase in the global disease burden attributable to mental disorders. The quality of services for mental health is often worse than that of services for physical health (Patel et al., 2018). The likelihood of death in people with severe mental disorders can contribute to preventable physical diseases or unnatural causes of death, including suicide, homicide, and accidents (John et al., 2018; Liu et al., 2017; Olfson et al., 2015). In addition, excess mortality in people with severe mental disorders is a public health concern, particularly among those not receiving proper interventions (Patel et al., 2018; Thornicroft et al., 2010). A survey (Bijl et al., 2003) in Canada, Chile,

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Germany, the Netherlands, and the United States showed that annually, one-third to two-thirds of patients with serious mental disorders received no treatment, particularly young and poorly educated men. Therefore, the provision of high-quality mental health care is vital for reducing disease burden attributable to mental disorders. Accordingly, community outreach aims to reduce health care barriers for patients with severe mental disorders and provide them with appropriate mental health services.

Intensive case management (ICM) is a widely accepted community-based care package aiming to provide long-term care for people with severe mental illness. ICM evolved from community models of the Assertive Community Treatment (ACT) and. ICM emphasizes the importance of small caseloads (typically fewer than 20) and high-intensity input. The latest meta-analysis results (Dieterich et al., 2017) indicate that ICM effectively ameliorates many symptoms of severe mental illness, reduces hospitalization, and increases retention of care. However, CM is different from ICM in that it handles caseloads of >20 people. It is likely to be a common practice in places where limited resources have been allocated to community care (Chang et al., 2013). In addition, the UK700 trial (Burns et al., 1999) suggested that caseload is not a major factor associated with improved outcomes for hospitalization of patients with psychosis. The UK700 participants were enrolled from routine clinical settings, and the findings could be not generalized to the patients requiring outreach services. To our knowledge, the effects of CM have rarely been studied and have seldom constituted the main comparator in trials; thus, research provides only limited evidence of its benefits (Dieterich et al., 2017). In Taiwan, Chang et al. (2013) studied patients with schizophrenia who received home care CM and discovered a significant reduction in psychiatric hospital admission frequency and inpatient stay duration, but the study was limited in sample size and used a local sample. Empirical studies are required for obtaining evidence-based information on the effect of home care CM. In addition, severe mental disorders are usually comorbid with physical problems, and this represents a challenge regarding the physical health needs of these patients (Wiley-Exley et al., 2013). The effects of a CM model on physical health utilization warrant further investigation.

In 1990, Taiwan enacted the Mental Health Act, which aimed to improve health care for patients with mental disorders by implementing criteria for involuntary hospitalizations and community-based care delivery systems. The home care CM model is part of community outreach-based care programs. In this study, we enrolled a large nationwide cohort of patients who received home care CM. The current study's main objective was to investigate the effectiveness of CM by using mirror-image analysis to compare indicators before and after home care CM. Several indicators, including psychiatric and non-psychiatric admissions, outpatient services, and involuntary admissions, were included in the analysis. Furthermore, we also estimated the maintenance effect of home care CM.

2. Methods

2.1. Data sources

In Taiwan, researchers may apply for access to the National Health Insurance Research Database (NHIRD). The database contains medical claim files for the entire population in Taiwan. The Psychiatric Inpatient Medical Claims Database is a subset of the NHIRD encompassing all patients hospitalized for psychiatric illness between January 1, 1996 and December 31, 2012 (N = 266,283) with one discharge diagnosis of mental illness according to the International Classification of Diseases, Ninth Revision (ICD-9) codes 290–319. The veracity of the database is ensured by the periodic review and recertification of each hospital providing psychiatric hospitalization in Taiwan. The accreditation for qualified psychiatric services requires board-certified psychiatrists to diagnose inpatients. In addition, the database has been used for numerous epidemiological and clinical studies published in peer-reviewed journals (Chen et al., 2017; Kuo et al., 2013). The Institutional Review Board of Taipei City Hospital approved this study. A waiver of informed consent was granted because the patient information in the national claims data from the NHIRD was deidentified before analysis. All researchers signed an agreement guaranteeing patient confidentiality before using the database.

In the service of home care CM in Taiwan, a responsible hospital provided psychiatric treatment and basic medical care. The hospital program comprised a multidisciplinary team including trained psychiatrists, psychiatric nurses, and social workers. Patients received one to four face-to-face sessions per month at home to evaluate their clinical symptoms, possible adverse reactions to drugs, and social functioning status. The program provided direct provision of medications and psychotherapy to enhance medication compliance, engage uncooperative clients, and provide patients and their families with psychoeducation and counseling.

In this study, we enrolled patients who according to the medical claims had received home care CM between January 1, 1999 and December 31, 2010, and had made at least one psychiatric visit during the 2-year period before the intervention (N = 10,274). We defined the first intervention of home care CM as the baseline.

Thus, the 2-year mirror comparison and analysis uses a 2-year observation window before January 1, 1999, and a 2-year observation window after December 31, 2010, for the 2-year mirror comparison and analysis. The study subjects should have at least one psychiatric visit before to the intervention (CM) for confirming their utilization of the health insurance system. Fig. 1 presents the flowchart of subject enrollment (N = 10,274). For further analysis of the 4-year maintenance effect, we restricted analysis to patients who received intervention from January 1, 1999 to December 31, 2008 (N = 7871). Thus, we have a 4-year observation window after December 31, 2008.

2.2. Variables

We conducted a broad search through all claims data; the collected data included demographics, diagnoses, prescriptions, and medical expenditures from between January 1, 1997 and December 31, 2012. Information including age at the time of the first home care CM intervention, number of new incident cases per year, types of hospitals providing home care CM programs, and urbanization of hospital

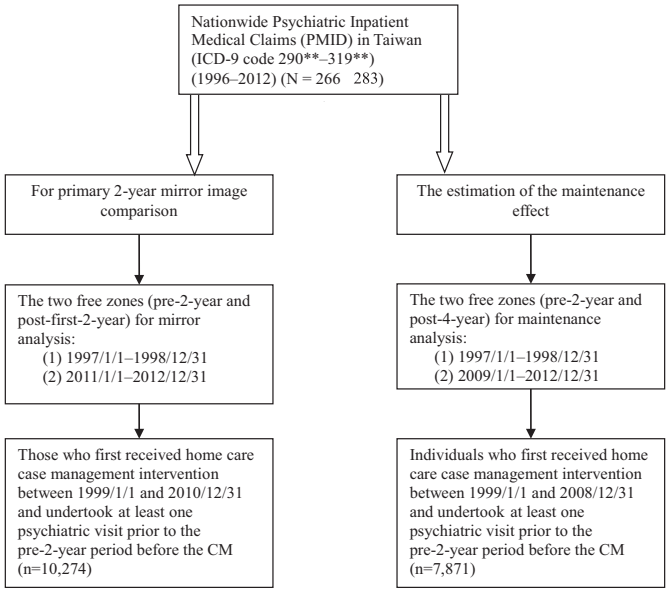

Fig. 1. Study flow diagram.