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Original Article

Economic outcomes of pharmacist-physician medication therapy management for polypharmacy elderly: A prospective, randomized, controlled trial

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Background/purpose: With an increasing geriatric population, the need for effective management of chronic conditions and medication use in the elderly is growing. Medication use in the elderly presents significant challenges due to changes in pharmacodynamic and pharmacokinetic profiles. We aimed to examine the impact of a collaborative physician-pharmacist medication therapy management (MTM) program for polypharmacy elderly patients.

Methods: Elderly patients with multiple chronic conditions on polypharmacy were enrolled in this prospective, randomized, and controlled study over 16 months of implementation. The intervention group consisted of patients randomized to a collaborative pharmacist-physician MTM program. They were monitored continuously by a clinical pharmacist, while patients in the control group received only usual care with follow-up assessment. Primary outcome was

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economic differences, measured in total medical expenditure. Secondary outcomes of clinical and humanistic effects were compared between the two groups.

Results: The total number of enrolled patients was 87 and 91 in the MTM and usual groups, respectively. The difference-in-difference estimate on medical expenditure during the 16-month implementation period was \$3,758,373 New Taiwan Dollars (\$127,015 US Dollars) less than the usually care group. Impact was also seen in humanistic outcomes while lipid profiles and mortality trended toward improvement.

Conclusion: The pharmacist-physician collaborative MTM program for polypharmacy elderly had significant cost savings and improvement in humanistic measures, demonstrating the importance of clinical pharmacists and MTM programs for elderly patients in Taiwan. The results suggest the possibility of clinical benefits, but the study was not substantially powered to find a statistical difference.

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Introduction

With a globally increasing geriatric population and rising costs of medication, the need for effective management of chronic conditions and appropriate medication use in the elderly is growing.^{1–3} The benefits of providing comprehensive patient care in the elderly *via* different approaches, especially through the coordinated efforts of an interdisciplinary team, have been demonstrated.⁴

“Polypharmacy” refers to the use of multiple medications by a patient, and has been defined in several ways.⁵ Some definitions use a numerical value and others use a consideration of quality.⁶ Examination of polypharmacy should assess the effectiveness of medication use and appropriateness of the prescription.⁷ Polypharmacy in the elderly is associated with multiple chronic diseases, more frequent contact with their prescribers, and increased risks of mortality.^{8–10} Health care providers must attentively survey medication use for the likelihood of medication-related problems (MRPs) and try to resolve these MRPs, especially in the elderly.^{11,12} It is helpful to engage pharmacists in comprehensive medication reviews to identify and craft appropriate solutions for MRPs, due to the limited time available to physicians in the outpatient settings.¹³ Physicians in Taiwan may see hundreds of patients in a single day of clinic and are less likely to spend time with their patients as physicians in the United States.¹⁴

There remain many challenges to implementing pharmacist cognitive services, including a lack of pharmacists’ time and a lack of recognition of ability by either the patients or the prescribing physicians.¹⁴ Appropriate interventions by pharmacists can reduce the complexity of a given medication regimen, improve patient compliance and quality of life, as well as provide a further reduction in morbidity, mortality, and/or health care costs for the elderly.^{4,15–17} Therefore, developing and establishing physician-pharmacist collaboration models to solve elderly patient’s MRPs in clinical practice settings is highly valuable.¹¹

Elderly patients have benefited from medication therapy management (MTM) services in the United States.^{14,18,19} The core elements of MTM service include “conducting

medication therapy reviews,” “establishing personal medication records,” “planning medication-related actions,” and “providing intervention, referral, documentation and/or follow-up”.²⁰ Little is known about the impact of MTM services on elderly outpatient populations outside of the United States due to variances in pharmacy practice environments, health care systems, and reimbursements from country to country.²¹ Although more than 92% of all health care facilities in Taiwan have been contracted with the National Health Insurance Administration (NHIA) since 2008, there is currently no official MTM program implemented in health care settings in Taiwan.²²

Aim of the study

A collaborative physician-pharmacist MTM service was established in an academic medical center in Taiwan with the goal of improving the quality of care for geriatric polypharmacy patients. This study aims to examine the economic and other outcomes of this collaborative MTM service.

Methods

Setting

This study was conducted at the outpatient clinics of China Medical University Hospital (CMUH), a university teaching hospital in Taichung, Taiwan. CMUH has more than 2000 beds and approximately 5000 outpatient visits per day. The average number of prescription items per outpatient at CMUH was 7.39 in 2011 compared to an average 5.05 throughout Taiwan.²² Most pharmacists in the outpatient pharmacy at CMUH perform the tasks of medication preparation, dispensing, and distribution. One full-time clinical pharmacist was trained to provide direct patient care services. The pharmacist implemented this collaborative physician-pharmacist MTM program in a stand-alone “Pharmaceutical Care Clinic”, which was located close to the other physician clinics in the outpatient units.

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