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A latent profile analysis on patient empowerment programme in a Hong Kong primary care setting

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ABSTRACT

Objective: This study identified the profiles of subgroups of type 2 diabetic (T2DM) patients of the Patient Empowerment Programme (PEP) by different levels of benefits gained in diabetic self-management behaviors, self-efficacy, and health literacy.
Methods: This study adopted a non-experimental repeated-measures design on T2DM patients who joined PEP, using structured questionnaires. Latent profile analysis (LPA) was used to identify patterns of participants' change on the outcome measures.
Results: Findings of LPA revealed that participants who were older, unemployed, weaker in diabetic self-management, and having a higher self-perception in personal disease risk were more likely to join the empowerment sessions and gained more benefits from the program. Participants with lower impairment in energy function and lower autonomy in personal health care showed more improvement in the outcomes.
Conclusion: The study identified significant factors associated with patients' participation on and benefits gained from a service delivery model integrating health education and patient empowerment in a primary care setting.
Practice implication: Findings from this study shed light on strategies to improve the PEP design in order to meet the needs of individuals with different health-related profiles.
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1. Introduction

The prevalence of chronic diseases has increased rapidly in the past 10 years and is projected to increase by approximately 2 billion more people by 2050, according to the United Nations [1]. Chronic disease is the leading cause of death globally. The proportion of deaths due to chronic diseases was 63% in 2008, and the World Health Organization (WHO) [2] estimates that it will increase by another 15% between 2010 and 2020. Type 2 Diabetes mellitus (T2DM) is one of the most commonly chronic diseases. It is estimated that 400 million people worldwide have T2DM and will increase to more than 600 million in 2040 [3]. Evidence has also shown that chronic diseases will result in microeconomic impacts on households and long-term macroeconomic impacts on health systems, labor supply, national incomes, capital accumulation and Gross Domestic Product worldwide [4].

WHO has identified four modifiable risk factors—poor diet, physical inactivity, tobacco use, and harmful alcohol use—for the development of chronic diseases, including T2DM [2]. These factors serve as global strategies for the prevention and control of chronic diseases. The Stanford Chronic Disease Self-management Program (CDSMP) is one of the best-known patient education programs. It has been developed to include both a generic chronic disease module and various disease-specific modules. The program is a group-based (10–15 people) intervention consisting of six weekly 2.5-h sessions. It has been adopted in at least 23 countries worldwide [5] and tested by many different populations [6–8] including China [9] and Hong Kong [10,11]. Meta-analyses have confirmed the small to moderate long-term effectiveness on

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psychological health and health behaviors for this type of intervention [12,13]. A recent meta-analysis study also revealed that the diabetes-specific CDSMP had significant improvements in HbA1c, self-efficacy, and diabetes-related knowledge [14].

The Hong Kong Special Administrative Region of the People's Republic of China (HKSAR), a territory in the Western Pacific with a highly efficient health-care system, is also facing the challenges caused by chronic diseases. The prevalence of chronic diseases increased from 20.2% of the total population in 2005 [15] to 29.8% in 2014 [16]. Over 80% of all-cause mortality in the past 12 years in Hong Kong is due to chronic diseases [17]. The Patient Empowerment Programme (PEP), a population-based shared care program, was initiated by the Hong Kong Hospital Authority in 2010. It aimed to improve the knowledge and skills of patients with chronic diseases, including T2DM, and enhance their self-management behaviors.

Previous studies have confirmed the effectiveness of PEP on clinical outcomes: (1) reducing the general outpatient clinic utilization rate over a 12-month period [18], (2) reducing all-cause mortality and cardiovascular diseases [19], and (3) enhancing the health-related quality of life [20] of participants with T2DM. Previous studies indicated that participants' health-related profiles, such as disease history, condition severity, health-related knowledge, and readiness to adopt healthier habits, may hamper the effectiveness of self-management behavior [21]. Such profiles, which may influence the effects of PEP, have not been fully investigated in the HKSAR health-care context.

The present study addresses this research gap by aiming to investigate the profiles of the group of patients of PEP with T2DM that benefited the most, according to the change in understanding the disease, self-management behavior, and self-efficacy in diabetic self-care. The findings will give more insight into further enhancement of the effectiveness of the self-management programs for patients with chronic diseases, including T2DM, in a primary care setting. It will also benefit triage participants with different health-related profiles in various types of programs to meet their health needs.

2. Methods

2.1. Study design and procedure

This study adopted a non-experimental 2-point repeated-measures design without a control group. The diabetic patients who were referred to PEP and had attended the first seminar were invited to join the study. The trained research assistants (RAs) first explained the objectives and procedures of the study to the patients before the start of the first seminar and obtained their written consent. The RAs, trained students, or volunteers then administered the structured questions to the participants and recorded the answers. The participants were again approached by the RAs three months after the baseline assessment to complete another questionnaire (post assessment). The ethics approval of the study was obtained from the Departmental Research Committee, Department of Rehabilitation Sciences, the Hong Kong Polytechnic University.

2.2. Participant recruitment

All participants were recruited from four service areas of PEP, which were operated by one NGO, and provided two sessions of patient education seminars and five empowerment sessions. The inclusion criteria were: (1) being 18 or above, (2) diagnosed with T2DM by registered by medical doctors, (3) referred by medical doctors of general outpatients clinics to PEP, and (4) volunteering to join the study.

2.3. Patient empowerment programme (PEP) in Hong Kong

PEP is a multidisciplinary private-public partnership service delivery model for patients with chronic diseases. Practitioners in the public sector collaborate with local NGOs to provide community medical service and health education supported by allied health professionals from the Hospital Authority. Patients referred from public primary health-care units by a general practitioner to this program are required to participate in two principal components sequentially: patient education seminar sessions (disease-specific knowledge component) and empowerment sessions (generic self-efficacy enhancement and lifestyle modification component). Patient education seminar sessions are conducted by registered nurses and aim to equip the patients with disease-specific knowledge (nature of the disease, signs & symptoms, complications, medication) and skills (self-monitoring of blood glucose or blood pressure, healthy diet). The empowerment sessions are conducted by social workers and aim to enhance their self-efficacy and self-management behavior by adopting the design of CDSMP.

2.4. Measurements

The questionnaire consisted of three parts. The first part collected participants' demographics covering age, gender, marital status, education attainment, occupation, and disease information. The second part measured the three domains of expected outcomes of the program: diabetic self-management behavior (by Summary of Diabetes Self-Care Activities, SDSCA), self-efficacy in diabetic self-care (Diabetes Self-Efficacy Scale, DSES), and health literacy (by Chinese Health Literacy Scale for Diabetes, CHLSD). The third part measured the potential factors associated with the magnitude of the outcomes, including risk perception in developing diabetic complications (by Risk Perception Survey for Developing Diabetes, RPSDD), readiness to make health-related changes (the Chinese version of the University of Rhode Island Change Assessment, C-URICA), impairment of body functions, and difficulty in activities (by ICF Core Set for Diabetes). In addition, participants' program attendance indicating the extent of group involvement was recorded for subsequent analysis.

SDSCA [22] contains nine items and measures respondents' self-perceived performance on diabetic self-management behaviors including diet control, exercise, blood glucose monitoring, and foot care by reporting the frequency of various activities over the previous seven days. It demonstrated acceptable internal consistency in Chinese patients with T2DM (Cronbach's $\alpha = 0.70–0.80$) and the current study sample (Cronbach's $\alpha = 0.46–0.87$).

DSES [23,24] contains eight items and measures respondents' self-efficacy in performing diabetic self-care activities. The Chinese version of DSES did not exist, so the research team translated the English version into Chinese. An expert panel evaluated the content validity and cultural relevance. The Chinese version of DSES demonstrated good internal consistency in the current study sample (Cronbach's $\alpha = 0.81$).

CHLSD [25] contains 15 multiple-choice questions and measures respondents' capacity to obtain, process, and understand basic health information in Chinese and services needed to make appropriate health decisions. It demonstrated good internal consistency in its validity study (Cronbach's $\alpha = 0.84$) and the current study sample (Cronbach's $\alpha = 0.88$).

RPSDD [26] contains 31 items and measures diabetic patients' perceived risk for developing diabetes in multiple dimensions. The Chinese version of RPSDD did not exist, so the research team translated the English version into Chinese. An expert panel evaluated the content validity and cultural relevance. The panel ascertained that six items from the environment risk of RPSDD did

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