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The effect of older-person centered and integrated health management model on multiple lifestyle behaviors: A randomized controlled trial from China

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ABSTRACT

Objective: To investigate the effectiveness of the older-centered Integrated Health Management Model Project (OPCHMP) for multiple lifestyle behaviours in the elderly.
Methods: A 2-arm, parallel, randomized controlled trial was conducted in Nanjing. The elderly were recruited from multiple community health service centres. The intervention group was intervened and received a personalized, 2-year OPCHMP. The control group only received usual care. Adherence to healthy lifestyle behaviours (ATHLBS) is the primary outcome, obtained through a self-reported composite health behaviour score. The secondary outcomes were health indicators. General estimating equation models were performed to analyse longitudinal dichotomous data and continuous data.
Results: 637 (intervention = 323; control = 314) participants were included in the study. The participants mean age was 70.53 ± 6.07 years. Significant ATHLBS correction was achieved after 24-month follow-up in the intervention group, comparing to controls. And the intervention group reported significantly better health indicators.
Conclusion: OPCHMP had positive effect on multiple lifestyle habits in elderly population, which is very encouraging.

1. Introduction

Non-communicable diseases (NCDs) remain a leading cause of disability and death (Allen et al., 2017) and represent an economic burden worldwide (Ding et al., 2016). About 60% of NCDs are caused by modifiable risk factors, including smoking, non-moderate drinking consumption, unhealthy diets and inadequate physical activity (Joseph et al., 2017). This situation is proof that multiple healthy lifestyle factors are strongly associated with NCDs (Bellack, 2017; Ogawa et al., 2017). The elderly have the highest prevalence of chronic diseases (Organization, 2017a,b, 2018; Zhao et al., 2017). As the age of the global population continues to increase, an increasing number of elderly people may adopt multiple unhealthy lifestyle behaviours simultaneously (Organization, 2017a,b, 2018). Previous studies have shown that certain health risk behaviours occur in combination and tend to accumulate in individuals (Orleans, 2004), leading to greater risk of disease and increased health care costs (Joseph et al., 2017; Linardakis et al., 2014). Fortunately, some studies have shown that people who adopt a greater number of healthy lifestyle habits live longer and have a better health-related quality of life (HRQOL) (Ding et al., 2016; Leila et al., 2015). Indeed, even in very advanced years, adopting healthy lifestyle habits can have powerful benefits for health

Abbreviations: OPCHMP, older person-centred and integrated health management model programme; ATHLBS, adherence to healthy lifestyle behaviours

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and wellbeing (Organization, 2017a,b, 2018; Woo et al., 2002). Therefore, there is an urgent need to develop a broad, comprehensive and effective intervention for multiple healthy lifestyle factors (Organization, 2017a,b, 2018).

To date, few studies have investigated effective interventions for multiple healthy lifestyle factors (upstream intervention studies). Moreover, these few studies have been published mainly in the United States, Australia, Europe and other developed countries (Leila et al., 2015). Pronk et al. mainly demonstrated the policy feasibility of multiple health behaviour interventions and called on patients, clinicians, health system leaders and policy makers to work together to develop viable solutions and implement them immediately (Pronk, Peek, & Goldstein, 2004). Vandelanotte reported that computerized tailored interventions and simultaneous intervention models had the same effect in promoting physical activity and reducing the fat intake (FI) for participants aged 20–60 years (Brug, 2008). Sanjoti used a summary of health scores or lifestyle scores as an indicator for adults aged 18–70 years to assess the effect of a computerized, tailor-made, multiple intervention model and found that the model simultaneously improved drinking and healthy diet habits; however, the effect of the intervention on smoking and physical activity was not obvious (Parekh et al., 2012). Leila found that cardiac rehabilitation interventions and usual care in adults with CHD in New Zealand showed a positive effect on compliance with behavioural changes at 3 months compared to usual care alone. Nevertheless, did not extend the intervention to 6 months ended (Leila et al., 2015). Most downstream intervention studies have focused on the distribution of multiple healthy lifestyle behaviours in a population either singly or in combination to identify positive health outcomes that meet the recommended healthy lifestyle guidelines (Larsson et al., 2017; Myint et al., 2011, 2013; Pronk, Anderson et al., 2004; Woo et al., 2002). Today, a limited number of multiple healthy lifestyle factor intervention models have been evaluated and often have shown promising results (Leila et al., 2015; Parekh et al., 2012). However, the long-term paradigm of improving multiple healthy lifestyle factors (smoking, risky drinking, lack of physical activity, and unhealthy diets) has yet to take shape.

The aim of this study was to investigate the effectiveness of an older person-centred and integrated health management model programme (OPCHMP) to improve adherence to recommended lifestyle behaviours (ATHLBS), in addition to usual care, in the elderly of China. We hypothesized that participants receiving OPCHMP would have greater ATHLBS after the intervention than those who received usual care alone. The secondary objectives included exploring the effects of the intervention on blood pressure, fasting plasma glucose, waist circumference and total cholesterol.

2. Methods

2.1. Subjects and methods

This research is a 24-month, 2-arm; parallel randomized controlled trial (RCT) design. It was being implemented in some community health service centres in Nanjing. We recruited participants should be aged 60 years and older and have lived for a long time (2 years) in the community. Those with cognitive deficits, severe chronic illnesses, multiple life-threatening comorbidities, and life expectancy less than one year, current or previous participation in another trial within the past 30 days were excluded (Nakanishi et al., 1995).

671 older adults met these criteria and completed a baseline survey. Subsequently, these individuals were randomly assigned to the intervention or control group, using a random number table followed up at a 1: 1 ratio for 24 months. To avoid contamination effects of the intervention, we will live together in the same family of people divide into different groups. Flow diagram of the progress in randomized trial is shown in Fig. 1.

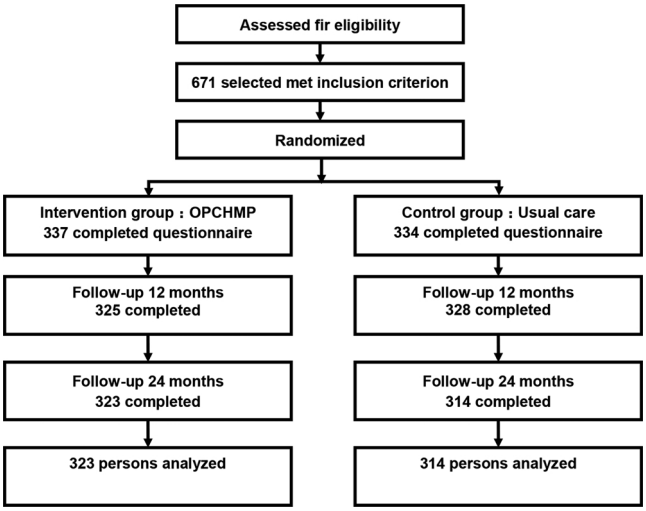

Fig. 1. Flow diagram of the progress in the randomized trial.

2.2. Intervention

All participants received a two-year routine care (CHM), which included a one-hour health education program every two months at a hospital or community center covering a range of topics including chronic disease risk factors, psychosocial support and lifestyle changes. In addition, the intervention participants also received a 2-year OPCHMP. That integrated self-management, individual health management, community health management and family health management. Self-management consisted of providing the participants with the information, skills and tools needed to manage their health conditions, prevent complications, maximize their intrinsic capabilities and maintain their quality of life. Individual health management included establishing a health record, performing a health evaluation, providing individualized instructions, and conducting telephone consultations and follow-up (Chao et al., 2015). Community health service center staff according to the elderly physical examination and disease information to establish health records. Health assessments are based on the medical conditions of the physical examination and the baseline survey. Individual health interventions are based on an individual's early health assessment, including tailor-made physical activity plans, diet and alcohol recommendations, and positive and optimistic counseling. We provided the participants with related knowledge and some skills that could enhance their health self-management ability. Community health management was provided through self-help groups, classes to encourage healthy behaviours, and physical exercise and dance classes. Family management included professional guidance regarding diagnoses, encouraging active participation of family members, and supervision and maintenance of tailor-made health behaviour programmes for the elderly. Once every two months, we completed the aforementioned task led by the multi-disciplinary team by phone / face-to-face within 24 months. All participants were visited at 12 and 24 months (December 2014 and December 2015). The aim of the visits was to gather outcomes of the project's ongoing intervention. Fig. 2 shows the older person-centred and integrated health management model.

2.3. Outcome measures

The primary outcome was the elderly ATHLBS. The participants received a score ranging from 0 to 4 based on the number of health guidelines they met. The participants were defined as adherent if they scored 2 or less and non-adherent if they scored 3 or more out of 4. The health behaviours, scores, and outcome measures were the smoking habit (0 = not currently smoking; 1 = had ≥1 cigarettes in the past 7 days) as measured by a smoking history questionnaire (Maddison et al.,