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The effectiveness of a community-based health promotion program for rural elders: A quasi-experimental design

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ABSTRACT

Objectives: A community-based health promotion program (CBHP) might be beneficial for the elderly, but evidence is limited. We therefore examined the effect of a CBHP on change of lifestyle, physiological indicators and depression score among seniors in 2 rural areas.
Methods: A prospective quasi-experimental design involved a total of 520 senior participants living in 6 rural villages, who were clustered and conveniently assigned to 2 intervention groups. Senior nursing students were the interveners for group 1 and community peer supporters for group 2. The primary outcome measure was the change in health-related behavior measured on the geriatric health promotion scale (GHPS). The secondary outcome comprised changes in the short form of the Chinese geriatric depression scale (CGDS-15), fasting blood sugar, total cholesterol, waist circumference and blood pressure. Paired-t test and analysis of covariance were used for statistical inspection.
Results: Most of the participants were retired farmers or fishermen >75 years of age who had little education. The total scores and all subscales of GHPS, along with some physiological indicators, improved significantly between pretest and post-test in both groups. After adjustment for confounders, intervention in group 1 was more effective than that in group 2 regarding self-protection behaviors. Systolic and diastolic blood pressure was significantly lower in group 2.
Conclusions: CBHP programs are valuable for improving healthy lifestyle, fasting blood sugar, blood pressure and depression score among seniors. The low cost and effectiveness of incorporating multidisciplinary resources to help rural elders to maintain a healthy status and a healthier lifestyle.

1. Introduction and background

Poor mental health is significantly more common in rural populations, perhaps because of a lack of health service access and early detection (Brumby et al., 2011). Among older adults, depression affects the quality of life, social activities, and physical health. Practicing health promotion, such as increasing physical exercise and social participation, is associated with improved mental health, healthy aging and a healthier physical status in the elderly (Blake, Mo, Malik, & Thomas, 2009; Holmes & Joseph, 2011; Infeld & Whitelaw, 2002; Matthews et al., 2011).

According to the World Health Organization (WHO), 2012), health promotion is defined as the process of enabling people to increase control over and improve their health. This goes further than focusing on individual behavior by including a wide range of social and environmental interventions. The concept of prevention in 3 stages and at 5 levels was prominent in public health during the later part of the 20th century. Among them, health promotion was regarded as a high priority strategy focusing on changes in both the environment and the individual to actively promote public health (Bureau of Health Promotion, (BHP), & Department of Health, Taiwan [BHP], 2012). This health paradigm shift helps us to consider what we should do when life expectancy exceeds 80 years. People > 65 years of age accounted for 10.9% of the population of Taiwan (Ministry of the Interior, MOI, & Department of Statistics, Taiwan [MOI], 2012). In addition, 15.6% of the population of Chiayi County comprises people >65 years old, the highest proportion nationwide. Depression projected to become the second leading cause of disability worldwide in 2020. The prevalence of geriatric depression in Taiwan is 21.4–24.2% (BHP, 2012).

Successful or healthy aging is the goal for the community-dwelling elderly, and promoting healthy lifestyle in aging could help to achieve this goal (Montross, Depp, & Baly, 2006; Shih et al., 2005). The

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beneficial effects of lifestyle behavior, including a healthy diet, physical activity and social participation, are key elements in healthy aging and important modifiable risk factors that can influence body fat, mental health and the prevention of chronic diseases (Bulló et al., 2011; Chiu & Spencer, 2010; Sodergren, McNaughton, Salmon, Ball, & Crawford, 2012). In order to improve the health status, the amount of physical activity for elders has recommended at least 150 min of moderate-intensity aerobic physical activity or at least 75 min of vigorous-intensity aerobic physical activity throughout the week. The aerobic activity should be done in bouts of >10 min duration (WHO, 2013). However, few health promotion programs that focus on the elderly population have been initiated from community-based and nurse-led research bases in rural areas. The purpose of this study has been to examine the effectiveness of a CBHP program on health-promoting behavior, physiological indicators and depression among rural seniors.

2. Methods

2.1. Research design, sample and setting

This project of "Health promotion for rural community seniors led by nurses" was supported by the Bureau of Health, Chiayi County. The aging population in this area is 15.6–21%, the highest in the nation (MOI, 2012). A prospective quasi-experimental design was carried out from March 1 to October 31, 2011. All participants were recruited and invited by district public health nurses (PHNs) from 6 rural villages, 4 near the western coastal side and 2 closer inland towards Central Taiwan. The selection criteria were: (1) >65 years, (2) ability to communicate in Taiwanese and Mandarin, and (3) willingness to participate in the study. Exclusion criteria were: (1) serious health status and mental problems, e.g. unstable cardiovascular disease, glycemic control, Parkinson's disease and dementia, (2) inability to express themselves precisely, and (3) inability to walk to the community activity center. Each participant's health status was subjectively screened and assessed by the PHNs.

The determination of sample size was based on the requirements to carry out t-tests, consider effect size = 0.30, $\alpha = 0.05$, and statistical power = 0.8. G-Power 3.0 was used to calculate sample size, showing a minimum of 352 cases would be required in each group. To prevent probable dropout of participants during the study period, Health Bureau staff encouraged recruitment by inviting elders by phone calls. A total of 585 eligible seniors consented to participate. Sixty-five participants discontinued and were excluded (because of moving home, changing health conditions, hospitalization, or becoming uncontactable), reducing the final number to 520 participants.

2.2. Intervention

According to the participants' home locations, the 4 villages on the western-coastal side and close to the nursing school were assigned to group 1, and the 2 villages on the inland side and far from the school were assigned to group 2. The participants in both groups received the senior's health promotion program for 24 weeks, 2 days per week, 2 hours per day. The content of the health promotion program comprised 8 health-related topics, how to: choose a healthy diet, maintain oral hygiene, prevent falls, engage in physical activity, self-protect, be responsible for health, manage stress, and use resources. These topics were rotated 2–3 times during each study period. The program was also conducted between 8:30 and 10:30 am, with 20–30 minutes of mild to moderate exercise being included (WHO, 2013) before and after each topic. Considering the age of the participants, we encouraged them to do aerobic exercise (such as walking) for at least 30 min per day for 5 days a week. Reports in the literature suggest that using the simple written brochure, development of culturally, language and literacy appropriate patient educational materials or a videotape with similar content for the low-literacy or less education participants, was better understood than the usual standard pamphlet (Jones et al., 2011; Pignone, DeWalt, Sheridan, Berkman, & Lohr, 2005). In view of the lower social economic status of the population who had little education, the teaching strategies included role play, media, material, large posters and games.

Before conducting the program, the interveners included 12 senior nursing students working with group 1 (nursing group) and 6 peer supporters working with group 2 (retired community group) who were retired community residents. They received a 4-day (8-h) training program from the investigators and multidisciplinary experts. Four experts from different fields – physical education and nursing faculties, dentist and general physician - were invited to be the trainers. The training program included knowledge and skills in group dynamics, basic health measurements (e.g. blood pressure, waist circumference, body height and weight), familiarity with the instruments, health promotion activities and counseling techniques.

2.3. Ethical considerations and procedure

This study was approved by the institutional review board (No. 9802224-B). Public health nurses explained the study objectives and obtained consent forms from the enrolled participants before baseline data collection. Less than 10% of the pre-post test data were collected using a self-administered questionnaire, and the rest were obtained through interviews by 10 research assistants. The interview consisted of having the research staff read the questions in Taiwanese or Mandarin to poorly educated participants. Considering the measurement error, before the project was conducted, the research assistants were separated into 5 pairs to interview an elder in the community activity center, and a 90% correct response rate of inter-rater reliability among the 5 pairs was confirmed.

2.4. Instruments

1. Demographic and physiological data included gender, age, educational attainment, living arrangement, fasting blood sugar (FBG), total cholesterol (TC), waist circumference (WC), body height and weight, and blood pressure. Physiological biomarkers were taken from the records of the senior's annual physical check up by the Chiayi Bureau of Health within the first 3 months of this study.
2. Geriatric health promotion scale (GHPS): The authors own design of a health promotion scale for seniors was applied. An 18-item version of the GHPS was established, and explained 63.8% of the total variance. A 4-point Likert scale was used to score the frequency of any behavior performed, which covered "never", "sometimes", "usually" and "always". The higher scores indicated more health promoting behavior. The questions concerning elderly health promoting behavior were based on those found in a literature review. A content validity index (CVI) was computed using the proportion of experts agreeing on item relevance. The CVI was 0.89 after evaluation by 5 nursing faculties in the field of elderly care. The internal consistency of reliability was measured by Cronbach's α (= 0.86), and the construct validity was established using factor analysis. The simplified version of the GHPS was made up of 4 dimensions of behavior: Self-protection (7 items, e.g. wearing non-slip shoes, getting enough sleep, taking three meals regularly), community participation (5 items, e.g. participating in township- or village-held activities), health responsibility (3 items, e.g. measuring blood sugar, blood pressure), and healthy diet (3 items, e.g. minimum intake of one and a half bowls of vegetable, 5 groups or balanced diet).
3. Chinese geriatric depression scale (CGDS-15): The Chinese geriatric depression scale-short form (CGDS-SF) included 15