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EVALUATION OF CHRONIC DISEASE SELF-MANAGEMENT PROGRAMME (CDSMP) FOR OLDER ADULTS IN HONG KONG

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Abstract: *Objectives:* To evaluate the locally-adapted CDSMP for older adults with chronic diseases in Hong Kong in the primary care setting. *Design:* A longitudinal, quasi-experimental study. *Setting:* Community-based and primary care setting. *Participants:* Seven hundred and seventy-two participants aged 55 or above with at least one chronic disease and were living in the community. *Intervention:* The 6-weeks programme consisted of 6 group sessions, with each session lasting for 2.5 hours. Trained professional and elder lay leaders facilitated participants to gain essential self-management knowledge and skills for the effective management of chronic diseases. *Measurements:* At baseline and 6 months, four categories of outcome measures were documented, covering self-management behaviours, self-efficacy, health status, and health care utilization. *Results:* 302 and 298 participants in the intervention and control groups completed 6 months follow-up respectively. Participants in the intervention group reported significant improvements in all self-management behaviours and self-efficacy measures, and 5 health status measures (social role limitation, depressive symptoms, health distress, symptoms of pain and discomfort, and self-rated health) when compared with those in the control group. *Conclusions:* The locally-adapted CDSMP may improve self-management behaviours, self-efficacy and health status among older adults with chronic diseases in Hong Kong. CDSMP may be integrated into primary care services for older adults.

Key words: Self-management, chronic disease, primary care, elderly.

Introduction

Chronic diseases have overtaken infectious diseases in becoming the major disease burden in the majority of countries worldwide. Over 35 million people died of chronic diseases in 2005 (1). In Hong Kong, approximately 800,000 older adults in Hong Kong have one or more chronic diseases (2), among which 10% suffer from 4 or more chronic diseases. Management of chronic diseases in elderly populations thus becomes a major focus for health services research, with the aim of contributing towards policy development.

The majority of the Hong Kong older population tend to belong to the lower socioeconomic groups, have poor health literacy, and have multiple morbidity including physical, psychological and cognitive dysfunction. Multi-morbidity and poor health literacy is known to create burden in individuals and health care systems (3-6). However, current knowledge and practice of effective care for older adults with multiple chronic diseases is limited (7). Thus, older patients rely on episodic medical services in public hospitals and clinics, which rarely address the multi-morbidities of older patients.

Recently, the Hong Kong government launched several strategic directions to tackle the challenge of chronic diseases through promoting patient empowerment (8). However, most of the local self-management interventions were carried out in the clinic- or hospital-based setting (9, 10), focusing on single chronic diseases (9-13) and younger age group (9,10,12). While the Chronic Disease Self-Management Programme (CDSMP) has been shown to be effective in providing self management support in the community setting (14), previous studies recruited mainly relatively young, highly educated and middle-class patients (14-21), including a local evaluation (22). In addition, primary medical care in Hong Kong is largely provided by the private sector and many older people cannot afford the long term medications for their chronic conditions. Compliance and control of chronic diseases are therefore sub-optimal. CDSMP in the community setting has the potential to fill a gap in primary care, in improving health literacy, coping skills, providing mutual support among older patients, and providing a programme that could be integrated into regular social activities where both health and social benefits can be attained. Therefore such a programme may have an important role in primary care of chronic diseases among the elderly population in Hong Kong.

The objective of this study was to evaluate the effectiveness of locally-adapted CDSMP for older adults with chronic diseases in Hong Kong. The impact of CDSMP on 1) self-management behaviours; 2) self-efficacy; 3) health status; and 4) health care utilization of the participants was investigated.

Methods

Procedure

The study was divided into two phases. The first phase was led by an academic organization (The Chinese University of Hong Kong) from April 2005 to May 2007. Subjected were recruited from local community social centres for the elderly within one district (Shatin, New Territories). In the second

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phase, the authors collaborated with a non-government, community-based organization (The Salvation Army-Elderly Service) between November 2007 and January 2009. The recruitment, intervention and training for leaders were extended to multiple districts (Shatin, Taipo and North District, New Territories). The method of recruitment, implementation and evaluation remained the same in both phases.

Participants were recruited through promotional announcements and presentations in community elderly centres, referrals from the day rehabilitation units and out-patient clinics located in public hospitals, promotional booths circulated in the community, and programme newsletters and leaflets. Potential participants were invited to visit programme sites for the baseline assessment. They gave written informed consent and were screened for eligibility, and then underwent a questionnaire assessment. The study was approved by the Clinical Research Ethics Committee of the Chinese University of Hong Kong. Research assistants, who were not involved in the programme delivery, provided assistance to the older participants to complete the questionnaire by face-to-face interview.

Participants were then enrolled into either the intervention group or the wait-list control group. Participants in the intervention group entered the programme promptly, while those in the control group received usual care for 6 months. We did not randomise the participants because self-management is shaped by numerous social, environmental and political factors which are difficult to be controlled in a clinical trial (23, 24). These factors would influence how patients respond to chronic diseases, and hence affect their health behaviours and outcomes. The heterogeneous nature of the programme content, complex medical history and low health literacy level of the participants further limited the applicability of randomization. We divided the participants into two groups according to their locality. Participants recruited in the intervention sites entered the programme immediately, whereas those recruited in the control sites received usual care. The programme sites (intervention and control) were specified before recruitment started. Participants were blinded to the programme sites at recruitment i.e., they were not allowed to choose which group they preferred. By allocating the programme sites in advance, we could control the rate of recruitment.

At 6 months, all participants were asked to visit the programme sites again to complete the follow-up questionnaire. After completing the 6-month assessments, participants in the wait-list control group were invited to join the programme.

Participants

All eligible participants had at least one chronic disease, including hypertension, heart disease, chronic lung disease, osteoarthritis, diabetes and stroke; to be aged 55 years or over; and living in the community. Participants were also allowed to join the study if they had other chronic diseases in addition to one of those shown above. In order to maximise the applicability of the programme across medical and non-medical sectors and the generalisability of the findings (25), the programme recruited a sample of participants based on self-report chronic diseases (17). Patients with significant cognitive impairment, advanced communication problem, cancer and received chemotherapy or radiation in the preceding year were excluded.

Intervention

The CDSMP consisted of 6 sessions, one session per week, with each session lasting for 2.5 hours. Each programme was conducted in groups of 10-12 participants in community elderly centres located in several districts by 2-3 trained professional leaders or elder lay leaders. The professional leaders were registered social workers, nurses, or allied health professionals, while the elder lay leaders were retired, older volunteers with chronic diseases. All professional and elder lay leaders had completed the CDSMP and a 4-day lay leader training course before leading any programme. The leaders taught the programmes following a standardised leaders' manual.

Table 1 shows the outline of programme content in each session. The programme content was based on the self-efficacy theory (26). Each session involved educational talk, group discussion, action planning and peer group support. The key feature of the programme was to encourage participants to build realistic goals and action plans to achieve their own goals. They were supported by their peers and leaders throughout the whole process through problem-solving and mutual encouragement.

Table 1
Overview of programme content

Session 1	Identifying common problems among participants
	Programme overview
	Differences between acute and chronic illnesses
	Cognitive symptom management and distraction
	Introduction to action plan, making an action plan
Session 2	Feedback and problem solving
	Dealing with negative emotions
	Introduction to physical activity and exercise
	Making an action plan
Session 3	Feedback and problem solving
	Better breathing
	Muscle relaxation
	Pain and fatigue management
	Endurance exercise
	Making an action plan
Session 4	Feedback and problem solving
	Planning for the future
	Healthy eating
	Communication skills
	Problem solving
	Making an action plan
Session 5	Feedback and problem solving
	Use of medication
	Making informed treatment decisions
	Depression management
	Positive thinking
	Guided imagery
	Making an action plan
Session 6	Feedback and problem solving
	Working with your health care professional
	Review and looking forward

Adaptations of programme delivery for local older participants

The content of CDSMP was translated into Chinese by the Hong Kong Society of Rehabilitation in 2002, and this version was evaluated in a previous study (22). However, it required further adaptations to cater to the special needs and characteristics of older adults in Hong Kong, such as poor literacy and minor cognitive dysfunction. While the authors retained all original topics from the programme developed by Lorig (14), vivid, real-life examples specific to the culture and habits of local older people were used to encourage them to incorporate self-management skills into their daily living. Leaders used simple, colloquial Chinese when they explained the concepts in order to facilitate the participants' understanding.

In addition, continuous support to the elder lay leaders was provided by a "coaching team", comprising a number of experienced leaders, to maximise their understanding of the programme, leading skills and confidence in giving talks to their peers. Moreover, they were required to lead a "placement group" before they could lead any programmes in the proper study. An elder lay leaders' society was formed, with regular reunions to maintain the leaders' network, enhance mutual cohesion and consolidate leading skills.

Sample size calculation

According to the outcome "self-efficacy in managing disease in general" of the CDSMP study in Shanghai (effect size: 0.24) (15), 274 participants in each group was required to achieve 80% power with two-tailed tests and significance level of 0.05 (27). Assuming that 20% of participants may be lost to follow up, 343 participants were needed in each treatment group.

Outcome measures

The outcome measures were developed by Stanford Patient Education Research Centre for evaluating health education interventions (28). It was translated into Chinese and validated by a previous study (15). Demographic data, including age, gender, years of education, marital status and disease profile of the participants were collected at baseline assessment. Four domains of outcomes were measured at baseline and 6 months, including 1) self-management behaviours; 2) self-efficacy; 3) health status; and 4) health care utilization. Total physician visits include the sum of visits to general practitioners and other health care providers, such as Traditional Chinese Medicine clinicians and physiotherapists.

Statistical analysis

Demographic characteristics and outcome measures at baseline of the participants in the intervention and control groups were compared using chi-square tests, Mann-Whitney U tests or independent t-tests. The dropouts and those who did not complete the 6-months follow-up assessments were compared with those who completed on demographics and outcomes at baseline.

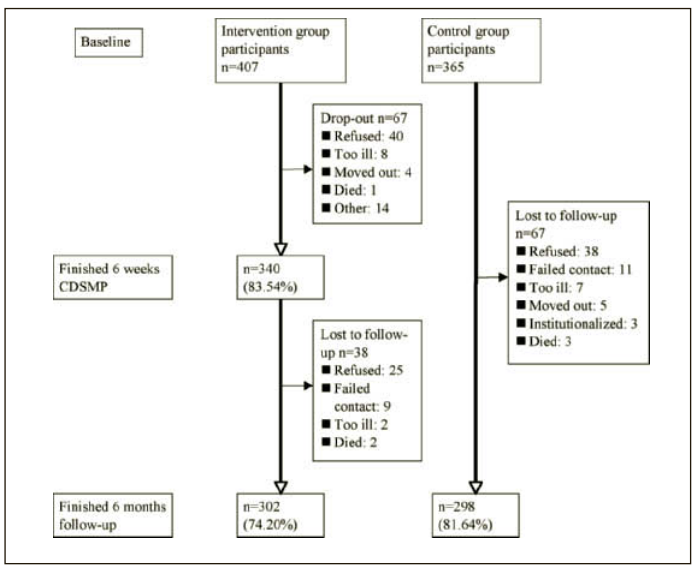
One-way analysis of covariance (ANCOVA) was used to compare the changes of outcomes at 6 months between the intervention and control groups, using demographic characteristics (age, gender, educational level, marital status, and number of chronic diseases), the baseline score of the corresponding outcome measures, and significant differences found between treatment groups at baseline as covariates. All statistical analyses were conducted at two-sided 0.05 significance level, using the SPSS computer software (version 13.0).

Results

Participants

Figure 1 shows the flow of recruitment and follow-up of the participants. Seven hundred and seventy-two participants were recruited and completed the baseline assessment. There were 407 participants in the intervention group who received the CDSMP immediately, and 365 participants in the wait-list control group who received usual care for 6 months. In the intervention group, 340 participants completed the programme (attending 3 or more of 6 sessions). When compared with those who completed the programme, the dropouts from the intervention group (n=67) had significantly more emergency room visits (0.75 vs 0.37; p=0.001) and spent more nights in hospital at baseline (4.31 vs 1.81, p=0.01).

Figure 1
Flow diagram of participants



CDSMP = Chronic Disease Self-Management Programme

302 (74.20%) and 298 (81.64%) participants in the intervention and control groups completed 6 months follow-up respectively. Those who failed to complete the 6 months follow-up (n=105) had spent significantly less time on doing aerobic exercises (144.86 vs 170.53, p=0.023), had lower energy level (2.64 vs 2.91, p=0.017), and poorer psychological

well-being at baseline (3.33 vs 3.60, p=0.049).

There were different follow-up rates between the intervention and control groups at 6 months (74.20% vs 81.64%, p=0.013). Comparison between participants who missed the 6 months follow-up in the intervention and control groups showed that there were significant differences in age (69.50 vs 75.22, p<0.0005), percentage of participants having arthritis (59.05% vs 74.63%, p=0.037), number of other health services visits (5.19 vs 6.21, p=0.049), and nights spent in hospital at baseline (4.09 vs 0.66, p=0.029).

Baseline

Table 2 shows the demographic characteristics of the participants in the intervention and control groups. When compared with the control group, the intervention group was significantly younger (72.57 vs 76.05, p<0.0005), had more married participants (50.66% vs 40.94%, p=0.021), and fewer participants having arthritis (60.26% vs 69.13%, p=0.023). Table 3 shows the mean scores of the intervention and control groups at baseline. Participants in the intervention group spent significantly less time in practicing stretching and strengthening exercise (p<0.0005), and aerobic exercises per week (p=0.016) at baseline. No significant difference was found between the intervention and control groups in other demographics and outcome measures.

Table 2
Participants' characteristics

Characteristics	Intervention (n=302)	Control (n=298)	P-value*
Mean age (SD)	72.57 (8.57)	76.05 (7.94)	<0.0005
Gender: Female (%)	76.82	82.89	0.064
Mean years of education (SD)	4.04 (4.09)	3.68 (4.03)	0.279
Marital status:			0.021
Married (%)	50.66	40.94	
Widowed (%)	40.73	52.01	
Mean number of chronic disease (SD)	2.28 (1.02)	2.39 (1.08)	0.196
Type of chronic disease:			
Arthritis (%)	60.26	69.13	0.023
Hypertension (%)	59.27	64.77	0.166
Diabetes (%)	32.45	28.52	0.296
Heart disease (%)	20.20	24.83	0.174
Stroke (%)	14.57	15.44	0.766
Lung disease (%)	9.27	8.39	0.703
Cancer (%)	5.63	6.38	0.700
Other diseases (%)	26.49	21.81	0.181

* Independent t-test or chi-square test was used to compare characteristics between intervention and control groups

Comparison between the intervention and control groups at 6 months

After controlling for the covariates, participants in the intervention group demonstrated significantly better results in all 4 self-management behaviours when compared with those in the control group (all p<0.05) (Table 4). Both self-efficacy measures were also significantly different, with the intervention group demonstrating improvements while the control group showing deterioration in self-efficacy of managing diseases and symptoms (both p<0.0005). Of the 10 outcome measures in health status, 5 showed more favourable outcomes in the intervention group. Social/role activities limitation (p=0.004), depressive symptoms (p=0.001), health distress (p=0.014), and pain and discomfort (p=0.006) were significantly reduced, while self-rated health (p=0.01) were significantly improved in the intervention group. None of the outcomes in health care utilization were significant.

Table 3
Baseline mean scores of outcome measures

Outcome measures#	Mean (SD) Intervention (n=302)	Control (n=298)	P-value*
Self management behaviours			
Exercises (minutes per week)			
Stretching and strengthening (0-180) ↑	103.76 (73.77)	125.74 (67.03)	<0.0005
Aerobic (0-900) ↑	160.53 (90.99)	180.65 (94.21)	0.016
Cognitive symptom management (0-5) ↑	0.78 (0.64)	0.75 (0.59)	0.923
Communication with physician (0-5) ↑	1.46 (1.30)	1.36 (1.21)	0.364
Self efficacy			
Self efficacy in managing disease in general (0-10) ↑	6.16 (1.96)	6.14 (2.14)	0.763
Self efficacy in managing symptoms (0-10) ↑	5.66 (2.22)	5.70 (2.41)	0.919
Health status			
Disability (0-3) ↓	0.19 (0.30)	0.21 (0.32)	0.762
Social/role activities limitations (0-4) ↓	0.65 (0.84)	0.66 (0.86)	0.931
Energy (0-5) ↑	2.93 (1.03)	2.89 (1.13)	0.560
Psychological well-being/distress (0-5) ↑	3.58 (1.00)	3.61 (1.01)	0.647
Depressive symptom (0-5) ↓	1.19 (0.95)	1.15 (0.97)	0.499
Health distress (0-5) ↓	1.16 (1.12)	1.21 (1.14)	0.647
Pain and discomfort (0-10) ↓	3.73 (2.60)	3.85 (2.76)	0.431
Fatigue (0-10) ↓	3.59 (2.51)	3.70 (2.56)	0.544
Shortness of breath (0-10) ↓	1.30 (2.27)	1.06 (1.96)	0.210
Self-rated health (1-5) ↓	3.69 (0.84)	3.77 (0.82)	0.272
Health care utilization			
Total physician visits ↓	10.33 (13.86)	9.18 (11.30)	0.609
General practitioner visits ↓	5.43 (8.49)	4.95 (8.61)	0.537
Other health service visits ↓	4.90 (9.43)	4.24 (7.16)	0.353
Emergency room visits ↓	0.38 (1.03)	0.37 (0.77)	0.389
Nights in hospital ↓	1.58 (7.17)	1.34 (5.27)	0.560

* Mann-Whitney U test was used to compare baseline mean scores between intervention and control groups; # The brackets indicate the range of score, and the arrows indicate the direction of favourable outcomes. Upward arrow means higher score indicates better result; downward arrow means lower score indicates better result.

Discussion

Main findings

This study demonstrates that participants in the intervention group had improvements in self-management behaviours, self-efficacy, and physical, psychological and social health outcomes at 6 months. The findings confirm that a culturally-adjusted CDSMP, led by either trained professional or lay leaders, was effective among older Chinese persons with chronic diseases in Hong Kong, and the effect lasted for at least 6 months. The low attrition rate in the intervention group (83.54% intervention group partipants finished the programme) indicates that after following adaptations for the characteristics of local older

population, the programme was well accepted by the participants. Although there was a difference in follow-up rate between the intervention (74.20%) and control groups (81.64%) at 6 months, the comparison of the dropouts shows no significant difference in most of the demographics and baseline measures.

Table 4

Comparison of mean changes of scores between the intervention (n=302) and control groups (n=298) at 6 months

Outcome measures#	Adjusted mean change (SE) Intervention (n=302)	Control (n=298)	P-value*
Self management behaviours			
Exercises (minutes per week)			
Stretch and strengthen (0-180) ↑	+11.59 (3.56)	-3.06 (3.60)	0.005
Aerobic (0-900) ↑	+17.96 (4.99)	-8.62 (5.05)	<0.0005
Cognitive symptom management (0-5) ↑	+0.37 (0.03)	-0.01 (0.03)	<0.0005
Communication with physician (0-5) ↑	+0.44 (0.07)	-0.03 (0.07)	<0.0005
Self efficacy			
Self efficacy in managing disease in general (0-10) ↑	+0.49 (0.11)	-0.33 (0.11)	<0.0005
Self efficacy in managing symptoms (0-10) ↑	+0.50 (0.12)	-0.41 (0.12)	<0.0005
Health status			
Disability (0-3) ↓	-0.02 (0.01)	+0.02 (0.01)	0.058
Social/role activities limitations (0-4) ↓	-0.14 (0.04)	+0.04 (0.04)	0.004
Energy (0-5) ↑	+0.13 (0.05)	-0.01 (0.05)	0.059
Psychological well-being/distress (0-5) ↑	+0.16 (0.04)	+0.04 (0.04)	0.064
Depressive symptom (0-5) ↓	-0.24 (0.05)	-0.02 (0.05)	0.001
Health distress (0-5) ↓	-0.24 (0.05)	-0.05 (0.05)	0.014
Pain and discomfort (0-10) ↓	-0.43 (0.14)	+0.12 (0.14)	0.006
Fatigue (0-10) ↓	-0.06 (0.13)	+0.03 (0.14)	0.654
Shortness of breath (0-10) ↓	+0.14 (0.12)	+0.30 (0.12)	0.336
Self-rated health (1-5) ↓	-0.14 (0.04)	+0.02 (0.04)	0.010
Health care utilization			
Total physician visits ↓	-1.29 (0.54)	-0.02 (0.55)	0.107
General practitioner visits ↓	-0.73 (0.36)	-0.17 (0.36)	0.275
Other health service visits ↓	-0.54 (0.39)	+0.15 (0.39)	0.226
Emergency room visits ↓	+0.04 (0.05)	-0.01 (0.05)	0.534
Nights in hospital ↓	-0.18 (0.33)	-0.04 (0.34)	0.773

* Analysis of covariance on the mean changes of scores at 6 months, controlling for age, gender, education, marital status, percentage of participants having arthritis, total number of chronic diseases, minutes per week of stretching and strengthening exercise at baseline, minutes per week of aerobic exercise at baseline, and baseline score of the corresponding outcome measure; # The brackets indicate the range of score, and the arrows indicate the direction of favourable outcome. Upward arrow means higher score indicates better result; downward arrow means lower score indicates better result

Comparison with existing literature

The findings from the study were compared with studies carried out in United States (14) and China (15). While the participants in this study were older and had lower education level, positive outcomes were observed as in earlier studies. Previous self-management studies have been criticised in that they often failed to recruit socioeconomically deprived patients with low health literacy, which may further reinforce social inequalities (29). The authors confirm that underprivileged, older patients who tend to have multiple morbidities could equally benefit from CDSMP.

No significant reduction in health care utilization was found in this study. Likewise, other CDSMP trials have shown modest or no improvements in this outcome (16, 17, 19). Older patients in Hong Kong tend to rely on the heavily subsidised public health care system, and they may be deterred from using private general practitioners. Rather, they may turn to the emergency room in public hospitals for ad hoc medical problems. Studying more frail and disabled patients who are heavy users of health care services may be useful to determine whether CDSMP can reduce health care utilization.

Implications for service provision

Taking an overview of the health care system in Hong Kong, services focused on chronic disease management are underdeveloped. While the public medical sector has set service priorities for enhancing primary care and optimizing chronic disease management (30), most of the services are still confined within hospital and clinic settings. Community-based non-government social organizations often face barriers and set a low priority in implementing health-related services. Lack of coordination between hospitals and community organizations often results in poor long-term support for patients. Group-based self-management programmes, such as CDSMP, could serve the majority of patients with chronic diseases at low-risk (31, 32). The delivery model adopted in this study showed that a partnership between medical and social sectors in coordinating care is feasible. In future, the programme may be integrated into the fabric of routine services in various social organizations, and lay leaders may be supported for health promotion purposes in the community setting. A referral system from hospital and clinics to non-government organizations could be developed to guide patients to participate in self-management programmes as a part of primary care services which complement episodic hospital encounters (31). This may improve the continuity of services. At the policy level, stakeholders of health care organizations and the government should prioritise services toward chronic disease self management, by providing leadership, consistent funding and resources, and integrating services across settings and levels of care (33).

Limitations

The participants in this study were not randomly allocated to either intervention or control groups. The participants were volunteers, therefore the results may only be applicable to those who were perhaps more motivated and willing to take part in the programme. The subjects had heterogeneous profiles of chronic diseases and conditions. Large variations in demographics and outcomes at baseline may contribute to the failure to detect significant differences in certain outcome measures. The duration of chronic diseases in the participants needed to be addressed as it may affect their response to the programme. However, it may be too difficult as the disease duration, being self-reported, may not be accurate and multi-morbidity is common in the older participants. Furthermore, the follow-up period was only six months. Extended follow-up would be useful to confirm that the skills acquired are incorporated into the participants' daily lives.

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