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REPORT OF RESEARCH RESULT

Title:

Effects of a Diabetes Self-efficacy Enhancing Program (DSEEP) on Older Adults with Type 2 Diabetes – A Pilot Study

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Summary

The pilot study started in April 2015 after ethical approval was granted by the National Health Group Domain Specific Review Board. It completed in Nov 2015. A total of 62 participants who met the selection criteria were recruited. Of this, 20 participants withdrew due to work commitment, sickness, overseas travel or did not offer reasons for withdrawal. Of the 42 who completed the study, 21 participants in the experimental group completed the Diabetes Self-efficacy Enhancing Programme while the remaining 21 participants in the control group continued to receive the usual care. Both groups completed the pre-test and post-test outcome measures. Thereafter, the data was analysed and findings were validated by the research team members. Though the statistical results were not significant, it showed that the experimental group as compared to the control group has higher increase in self-efficacy and self-care activities and a higher reduction in blood glucose level.

Aim of Research:

The aims of this study were to develop a self-care management programme named Diabetes Self-efficacy Enhancing Program (DSEEP) and examine the feasibility and possible effectiveness of the programme on the self-efficacy level, level of diabetes self-care activities, health-related quality of life, blood glucose level and health-service use of older adults with type 2 diabetes in Singapore.

It was hypothesized that participants in the experimental group as compared with participants in the control group will have:

1. higher level of self-efficacy;
2. higher increase of diabetes self-care activities;
3. improved blood glucose level;
4. reduced unplanned health service usage;
5. better quality of life.

Methodology

Study Design

A pilot randomised control trial was adopted in this study. After the participants have given their written consent, they were randomly assigned to either the experimental or the control group. Participants in the experimental group underwent DSEEP while those in the control group continued with usual care which include regular medical follow up with the doctor at the clinic, face-to-face counselling with a nurse educator and attendance at monthly diabetes talks at the polyclinics.

Participants

Participants were older adults with type 2 diabetes living permanently in Singapore. A convenience sampling was used in this study to recruit patients with type 2 diabetes who visited the polyclinics for regular follow-up, medical care or consultation. Those who met the selection criteria were approached and invited to participate in the study. Selection criteria include patients who: (1) had confirmed medical diagnosis of type 2 diabetes; (2) were 50 years old and above; (3) had blood test result of HbA1c > 8% in the most recent test; (4) were able to communicate over the telephone; and (5) were able to speak and read English or Chinese.

Study interventions

The Diabetes Self-efficacy Enhancing Programme was an 8-week programme comprising a day workshop, a fortnightly telephone call follow-up for 6 weeks, a newly developed diabetes guide booklet and DVD as self-help resources for home use. The programme integrated strategies such as verbal persuasion, vicarious experience, enactive attainment and physiological feedback to increase participants' self-efficacy,

leading to increase in diabetes self-care activities which, in turn, may improve blood glucose level with quality of life. The design of the diabetes guidebook used a question and answer format to address issues on diabetes self-care activities raised at 4 sessions of focus groups involving the three major ethnic groups. The guide book was then validated by a family physician, a diabetes nurse educator, a dietitian and research team members. The content of the booklet includes: (1) diabetes and complications; (2) medication management; (3) diabetes diet (culturally-tailored); (4) physical exercise; (5) insulin administration; (6) blood glucose monitoring; (7) acute diabetes-related complication management such hypoglycaemia and hyperglycemia; (8) chronic diabetes-related complication preventions such as annual Foot and eye screening and regular medical consultations; (9) sick day and overseas travel management. Approval from the Singapore Health Promotion Board and the Diabetic Society of Singapore were also obtained to use their material for the guide book. The DVD which contained video clips of injection techniques and techniques of blood glucose monitoring from SingHealth was also produced. Both booklet and DVD were translated to Chinese and given to every participant in the experimental group. A day workshop was conducted to teach participants on using the guide book and DVD including mastering their self-care skills. Thereafter, three fortnightly telephone call follow-ups were made to address issues faced by participants after the workshop.

Outcome Measures

Outcome measures include the following:

- a. 10-item General Self-efficacy Scale which measures one's competence to deal with challenging life events;
- b. 11-item Revised Summary of Diabetes Self-care Activities Scale which measures diabetes self-care activities eg medication, diet control, exercise, foot check;
- c. 19-domain Diabetes-Dependent Quality of Life Questionnaire which measures impact of diabetes on family and social life, work, leisure, travel, living activities;
- d. Unplanned Health Service Usage Questionnaire which measures sudden visit to Accident and Emergency department, hospital admission or unplanned medical consultation at the clinic;
- e. HbA1c (Blood Sugar level) which measures average blood sugar level in the last 2-3 months.

All participants in the experimental group and control group completed the 4 questionnaires before and after the 8-week programme. Blood sugar level results were retrieved from the laboratory.

Results of Research

A total of 62 participants who meet the selection criteria were recruited from Apr 2015 to Jun 2015. Of this, 20 participants withdrew and 42 completed the study from Jun to Sep 2015. Of the 42 participants, 21 participants in the experimental group underwent DSEEP and 21 others in the control group continued with the usual care. All the participants completed the pre-test and post-test outcome measures. Process of sampling and data collection is presented in **Appendix I**.

Data collected were input into IBM SPSS 22.0 for analysis. Descriptive statistics was conducted for sample description and data was summarized from the dependent variables. Homogeneity (socio-demographic & clinical variables) of the 2 groups was determined using Independent T-tests while Chi square tests were used for nominal variables. Independent T-test was also used to analyse the intervention effects and compare change in study outcomes between the 2 groups at the 2 study time-lines. The findings were validated by the research team members. In terms of demographic characteristics, there was no significant difference in terms of age, gender, marital status, employment and education level between the experimental group and the control group. Demographic characteristics of the 2 groups are provided in **Appendix II**. Outcome measures showed that the experimental as compared to the control group has a higher increase in self-efficacy and self-care activities and a higher reduction in blood glucose level. A notable finding is a much higher deduction in blood glucose level for the experimental group with a mean net difference of -1.52 versus -0.44 for the control group. A reduction in blood glucose level is indicative of a reduction in the risk of diabetes-related complication such as stroke, heart attack, renal failure, blindness and leg amputation. Statistical results on intervention effects on the 2 groups are presented in **Appendix III**.

As this is a pilot study, the study limitation lies in the small sample size which influences the significance of statistical results between the 2 groups.

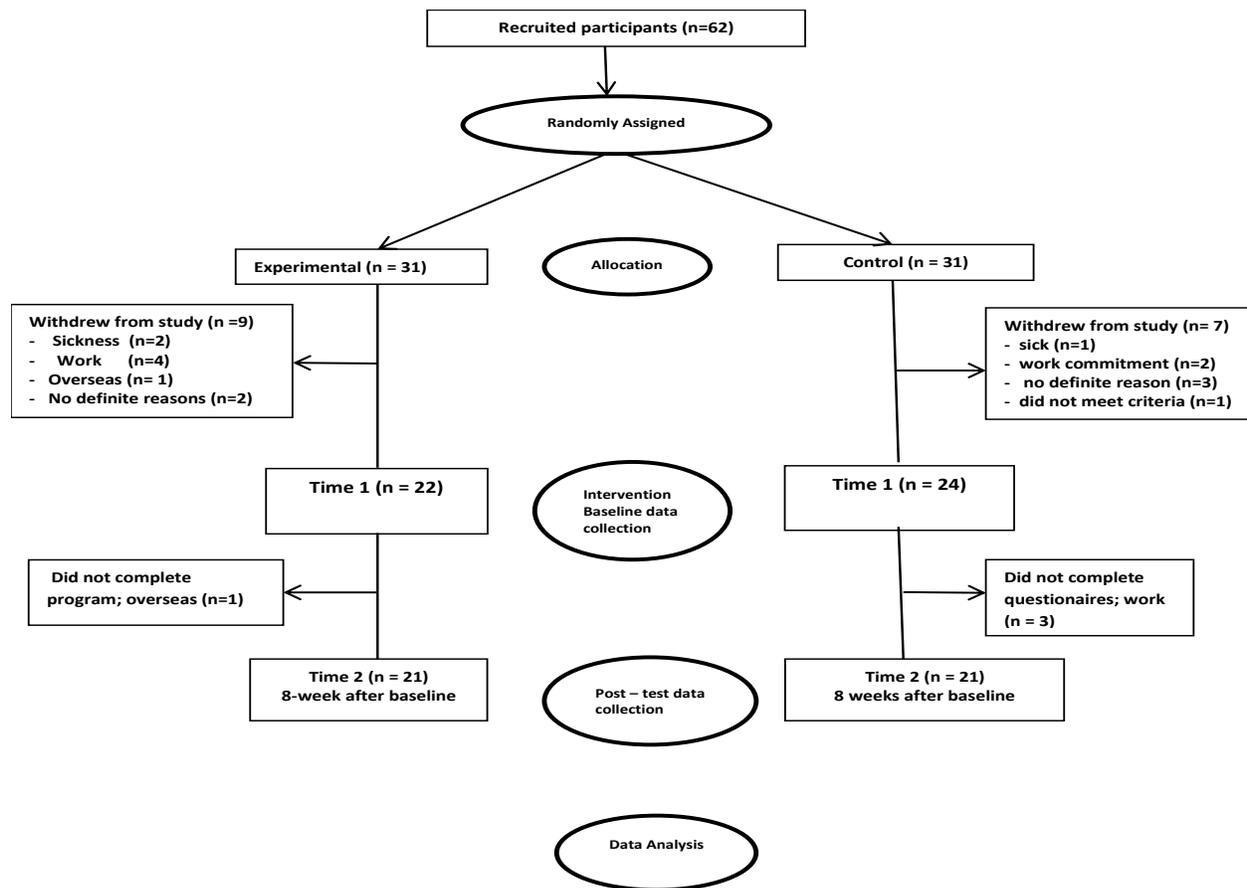
Future Areas and Going Forward

The research team has reviewed the pilot study results and decided to proceed with the main study. A larger group of participants with a sample size of 142 in total has started and we hope to see statistically significant results at the end of the main study.

Means of Official Announcement of Research Results

The team will submit the results for publication at the end of the main study.

Sampling and Data Collection



Research Results - Demographic Characteristics

Characteristics	Experimental Group (n= 21)	Control Group (n=21)	Significance
Age (year) (mean ± SD)	61.0 (SD± 6.741)	62.8 (SD± 6.129)	T = - 0.886 P = 0.381
Duration of disease (mth) (mean ± SD)	145.0 (SD± 94.90)	75.1 (SD±128.42)	T = 0.629 P = 0.533
<u>Gender</u>		14	X ² = 0.889 P = 0.346
Male	11		
Female	10	7	
<u>Marital Status</u>		15	X ² = 3.667 P = 0.453
Married	15		
Single	4	2	
Divorced	1	3	
Widow/widower	0	1	
Others	1	0	
<u>Education level</u>			X ² = 6.648 P = 0.156
No formal education	2	0	
Primary	7	3	
Secondary	10	11	
ITE/Diploma/'A' level	2	6	
Degree	0	1	
<u>Employment status</u>			X ² = 1.211 P = 0.750
Employed (part-time)	6	8	
Employed (full-time)	8	9	
Retired	3	2	
Unemployed	4	2	

Research Results- Intervention Effects

Outcome Variable	Baseline Before Intervention		After intervention		Mean Net change	
	Experiment (n=21)	Control (n=21)	Experiment (n=21)	Control (n=21)	Experiment (n=21)	Control (n=21)
Self-efficacy	3.05 (SD±0.56)	2.78 (SD± 0.72)	3.24 (SD± 0.52)	2.96 (SD± .46)	0.19 (SD± 0.43)	0.18 (SD± 0.58)
Diabetes Self Care	3.37 (SD± 1.39)	3.32 (SD± 1.37)	4.12 (SD±1.25)	3.41 (SD±1.40)	0.75 (SD±1.14)	0.09 (SD±0.65)
Quality of Life	-3.96 (SD±2.89)	-4.08 (SD±2.40)	-4.52 (SD±2.32)	-3.69 (SD±2.92)	- 0.56 (SD±2.22)	0.39 (SD± 2.25)
HbA1c	10.40 (SD± 1.98)	9.27 (SD± 1.03)	8.88 (SD±1.47)	8.83 (SD±1.58)	-1.52 (SD±2.28)	-0.44 (SD±0.98)
Unplanned Health Services	5%	14%	0%	0%	-5%	-14%