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Article

A feasibility study of a telephone-supported self-care intervention for depression among adults with a comorbid chronic physical illness in primary care

Jane McCusker MD DrPH
Department of Epidemiology, Biostatistics and Occupational Health, McGill University; St Mary's Research Centre, Montreal, Canada

Martin Cole MD FRCPC
Department of Psychiatry, McGill University; Psychiatry, St Mary's Hospital Centre, Montreal, Canada

Mark Yaffe MDCM MClSc CCFP FCFP
Department of Family Medicine, McGill University; Family Medicine Centre, St Mary's Hospital Centre, Montreal, Canada

Tamara Sussman PhD
School of Social Work, McGill University, Montreal, Canada

Kim L Lavoie PhD
Montreal Behavioural Medicine Centre; Department of Psychology, University of Quebec at Montreal; Division of Chest Medicine, Research Center, Hôpital du Sacré-Cœur de Montréal; Research Centre, Montreal Heart Institute; Department of Psychology, Université du Québec à Montréal, Canada

Erin Strumpf PhD
Department of Epidemiology, Biostatistics and Occupational Health, McGill University; Department of Economics, McGill University, Montreal, Canada

Maida Sewitch PhD
Department of Medicine, McGill University; Divisions of Gastroenterology and Clinical Epidemiology, McGill University Health Centre; Royal Victoria Hospital, Montreal, Canada

Deniz Sahin MD
Department of Family Medicine, McGill University; St Mary's Research Centre, Montreal, Quebec, Canada

Manon de Raad
St Mary's Research Centre, Montreal, Quebec, Canada

ABSTRACT

Objective We assessed the feasibility and acceptability to patients of a telephone-supported self-care intervention for depression among adults aged 40 years or over with one of six targeted chronic physical illnesses and comorbid depressive symptoms in family practice settings.

Methods An open, uncontrolled trial (feasibility study) was conducted among patients treated in Montreal family practices. Eligible patients were aged 40 years or over, had one or more of the targeted chronic physical illnesses for at least 6 months (arthritis, hypertension, diabetes, heart disease, asthma and chronic obstructive pulmonary disease) and were evaluated as having at least mild depressive symptoms (a score of ≥ 5 on the 9-item Patient Health Questionnaire, PHQ-9). Participants received a package of six self-care tools (information booklet, video, Internet programme, action plan, workbook and mood-monitoring tool) with telephone support by a lay coach for up to 6 months.

Results In total, 63 eligible patients provided written consent and completed the baseline interview; 57 (90%) and 55 (87%) patients completed 2-month and 6-month follow-up interviews, respectively. The mean number of telephone calls made by coaches to participants was 10.5 (SD 4.0), and the average length of these calls was 10.6 minutes. At the 6-month follow-up, 83.6% of the participants reported that one or more of the tools were helpful. Clinically significant improvements were seen in depressive symptoms (as assessed by the PHQ-9) at 6 months, with an effect size of 0.88 (95% CI, 0.55, 1.14).

Conclusion A telephone-supported self-care intervention for depression was feasible, was acceptable to patients, and was associated with a significant 6-month improvement in depressive symptoms. A randomised trial of this intervention is justified.

Keywords: comorbidity, depression, feasibility, primary care, self-management

Introduction

Depression is a frequent and serious problem in primary care settings; its course is often chronic and relapsing.[1] People with chronic physical illnesses are at high risk for depression,[2] and for experiencing poor outcomes (increased morbidity,[3,4] mortality,[5] functional decline,[6–9] and high rates of use and costs of health services[6,10,11]). Depression increases nonadherence to medical treatment[12] and unhealthy behaviours (e.g. physical inactivity).

Treatment guidelines for depression among adults with a chronic physical illness recommend low-intensity psychosocial interventions (including those based on principles of cognitive behaviour therapy, or CBT) rather than antidepressant medications.[13] However, in many locations, publicly funded CBT is scarce.[14] In this context, supported self-care interventions are attractive, because they offer a low-intensity alternative to the psychosocial/psychological/medical treatment and management of depression, and may reduce demands on mental health services.[15,16] Self-care interventions based on CBT principles have shown promise in the management of many chronic illnesses, including depression.[17,18] To date, however, there has been little research on the feasibility, acceptability to patients or effectiveness of self-care interventions for depression among adults with comorbid chronic physical illnesses.[19]

We aimed to assess the feasibility and acceptability of implementing a telephone-supported self-care intervention for depression in primary care patients aged 40 years or over with depressive symptoms and comorbid chronic physical illness. We conducted an open, uncontrolled trial of the intervention with the following objectives: (1) to explore barriers to identifying and recruiting eligible patients from family practices; (2) to describe patient use and perceptions of different types of self-care tools; (3) to describe changes in depressive symptoms and health behaviours in relation to use of tools; and (4) to compare the above as a function of age and baseline depression severity.

Methods

The study design was an open, uncontrolled trial. The study was conducted during 2010–2011.

The intervention

We conducted focus groups and consultations with family physicians (FPs), social workers, psychologists, and nurses with experience in depression management in primary care to develop the intervention and select the self-care tools. A 'toolkit' containing a variety of self-care approaches to manage depression (both informational and behavioural) was assembled, and included audio-visual, Internet and paper-based tools selected for their appeal to individuals with different learning styles. We used both existing materials and those adapted (with permission) for the study. Because of our bilingual population, tools were required in both English and French.

We then pre-tested the revised tools and study questionnaires among patients from family practice and psychiatric settings (n = 12), including older men and women with varying severity of depression. As a result of this preparatory phase, the language used in both the tools and the study questionnaires was simplified. We also adjusted some of the graphics and illustrations in the tools to make them more visually appealing.

The final toolkit consisted of three informational tools, three behavioural tools and two supplementary tools. The informational tools were (1) a video/DVD on depression,[20] (2) an information leaflet that emphasised the link between depression and chronic

disease, and (3) information on how to access two Internet programmes, one in English and the other in French.[21,22] The behavioural tools incorporated principles of CBT, and consisted of (1) the Antidepressant Skills Workbook (paper and audio versions)[23,24] used elsewhere in Canada in depression self-care interventions, (2) an Action Plan, adapted from the Workbook, that targeted five behaviours (taking prescribed medications, eating a healthy diet, being physically active, increasing social activity, and making time for rewarding activities), and (3) a Mood Monitoring Notebook, adapted from a similar tool[25] that allowed individuals to rate their mood up to three times a day. The supplementary tools were an adapted Information Booklet for family members,[26] and a Community Resources Manual that described support and self-help groups available in the community.

Two bilingual (English/French) coaches (non-therapists with some counselling experience) were trained to provide telephone-based support for up to 6 months. A schedule of short, weekly calls for the first 3 months was followed by monthly calls up to 6 months. The coaches were guided by scripts to provide information and encourage and guide the patient in the use of the tools, but not to provide therapy. The study psychiatrist (MC) and psychologist (KL) trained and supervised the coaches; each coach call was logged and audiotaped to aid supervision.

Recruitment of family practices

We sought to determine the feasibility of FP participation in an unselected sample of FPs using a list of FPs obtained from the provincial association of FPs. Thus we sent letters to a random sample of 375 FPs practising within approximately 30 minutes travelling time of the study site in metropolitan Montreal, inviting them to meet a research assistant (RA). Those who agreed to participate signed a consent form, and arranged to distribute (mostly via office staff) study screening forms to their patients during an office visit. A member of the research team met with office staff and helped them to select an appropriate method of distributing and collecting screening forms (e.g. via secretaries, nurses or FPs). This person then visited each practice regularly to troubleshoot the distribution of screening forms. A study newsletter to update FPs on progress with the study and to motivate continued participation was distributed periodically. Irrespective of this study, FPs were expected to continue their normal care for all patient problems as conditions dictated.

Recruitment and follow-up of patient sample

Participants were required to meet all of the following inclusion criteria: age 40 years or over, diagnosed with one or more of the targeted chronic physical illnesses (arthritis, hypertension, diabetes, heart disease, asthma, chronic obstructive pulmonary disease) at least 6 months previously, and evaluated as having at least mild depressive symptoms (a score of $\geq$ 5 on the 9-item Patient Health Questionnaire, PHQ-9).[27,28] Exclusion criteria were residence in a nursing home, suicidal plans, inability to read in either English or French, and a cognitive or physical impairment that would prevent participation in the self-care intervention. Cognitive impairment was measured with the 6-item Blessed Orientation-Memory-Concentration (BOMC) test.[29] Patients with a score of $\geq$ 10 were excluded; a score of 6–9 indicated mild cognitive impairment.[30] Finally, patients who were receiving counselling or help at least once a month for a mental health problem from any health professional other than their family doctor were excluded. However, patients who began such treatment after enrolment were not withdrawn from the study.

Inclusion and exclusion criteria were assessed using a two-step process: (1) screening via self-completed questionnaire at an FP office visit; and (2) a telephone interview with a trained RA. During Step 1, patients completed a form enquiring about age, physician-diagnosed chronic physical illnesses, and a two-question depression screen.[31,32] Patients who fulfilled the study criteria who were interested in participating in the study were asked to indicate this by signing the questionnaire and by providing a contact telephone number.

During Step 2, the RA administered a verbal consent. Among those who consented, the RA then verified the eligibility criteria and invited eligible patients to participate in the study. Those who provided subsequent verbal consent were sent the study consent form with a stamped pre-addressed return envelope. Those who returned the signed consent form were sent a package of self-care tools, and were contacted for a baseline telephone interview. Follow-up telephone interviews were conducted at 2 and 6 months after the baseline interview, to assess use and perceptions of the self-care tools, and outcomes.

Patients with severe depressive symptoms (a PHQ-9 score of $\geq$ 20) at screening were not excluded from the study, but were specifically referred to their FP. Those whose depression worsened during the course of the study were either referred to their FP or were closely observed by their coach and the study psy-

chiatrist. Patients were not withdrawn from the study unless they had suicidal plans.

Outcome measures

The primary outcome measure was the change in the PHQ-9 score from baseline to 6 months. The PHQ-9 has been validated as a responsive outcome measure.[27,28]

The following secondary outcome measures were assessed at the baseline and 6-month follow-up interviews. The Short Form-12 (SF-12) physical and mental component summary scores measured physical and mental health status.[33] The 13-item Patient Activation Measure (PAM)[34,35] was used ; the overall score ranges from 0 to 100, with higher scores indicating greater activation.[34] Measures of daily activities during the previous week, adapted from prior instruments,[36–39] included social activities (visits and telephone conversations with family members, friends and neighbours, attendance at religious services, social or recreational groups, and trips), solitary activities (spending time on hobbies, or on reading, writing, or listening to music, or attending concerts, plays or art exhibitions), and productive or physical activities (volunteer work, light housework and heavy housework). Questions about current smoking and alcohol use were adapted from the Health Practices Index.[40] Adherence to prescribed medications was measured with the 4-item Morisky questionnaire.[41] The Godin Leisure Time Exercise Questionnaire was used to assess physical activity during the previous week.[42] At 6 months, participants were asked whether they had changed any health behaviours (adherence to daily medications, healthy eating, exercise, social activities, and making time for rewarding activities).

Antidepressant medication use at baseline was based on patient self-report. At the 6-month follow-up, patients were asked about any changes in these medications, and about any psychological or counselling therapies they had received since entering the study.

Measures of self-reported health services utilisation at baseline included hospitalisation during the previous 12 months, emergency department visits and doctor visits during the previous 3 months, and formal homecare services during the previous 4 weeks. These questions were repeated at the 6-month follow-up (the reporting period for hospitalisation was the 6 months since entry to the study).

Measures of patient adherence to and perceptions of the intervention

We assessed intervention adherence using measures of the extent to which patients reported that they used each tool at 2 months, and the total number of completed coach telephone calls made by 6 months. We assessed the acceptability of the intervention by asking patients at 6 months about the perceived helpfulness of each tool and the coach calls, and their overall satisfaction with the intervention.

At the 2-month interview, we asked patients which self-care tools they had tried, and how much of each tool they had completed on a 6-point Likert scale from 0 (not at all) to 5 (completed). The measure of use of the Mood Monitoring Notebook was frequency of use during the previous 2 months on a 6-point Likert scale from 0 (not at all) to 5 (every day). Mean tool use scores were computed across the informational and behavioural tools, respectively, and grouped as < 1 (minimal), 1–2 (moderate) and 3–5 (high). We also asked patients to comment on what they liked most and least about the tools that they had selected.

At the 6-month interview, patients were again asked which of the tools they had used (but not about the extent of use). We also asked how helpful each tool was in improving their mood (helpful, neutral or not helpful). Patients were asked to comment on how each tool was helpful, and what would have made each tool more helpful. They were also asked whether the phone calls from the coach were an important part of the intervention (yes, no or not sure), and whether they could have used the tools on their own (yes, no or not sure). General satisfaction with the study intervention was measured with the Client Satisfaction Questionnaire (CSQ-8).[43,44]

Other measures

Sociodemographic variables collected at screening or baseline interviews included age, gender, language of intervention (English or French), living arrangements, marital status, level of education, place of birth and family income.[45,46] Comorbid mental disorders were also assessed at screening.[47,48]

Statistical methods

We compared characteristics of the sample, use and perceptions of the tools by age and depression severity using the chi-square test, Fisher's exact test and *t*-tests. The clinical significance of change in the PHQ-9 outcome at 6 months was assessed

with two measures, namely the percentage of individuals whose symptoms declined by at least 50% from the initial level, and the effect size (the pre–post change divided by the SD of the 6-month score).[49] Changes over time from screening or baseline to 6 months in the outcome variables were analysed using generalised estimating equation (GEE) methodology.[50] Similar approaches were used to compare the change in the outcome variables for the two age groups (< 60 and ≥ 60 years) and baseline PHQ-9 group (< 15 and ≥ 15). The association between intervention adherence (use of tools at 2 months and number of coach contacts over 6 months) and changes in the PHQ-9 at 6 months was analysed using linear regression models.[51] Level of depression (PHQ-9) at baseline was forced in all multivariable models. Additional baseline variables (age, gender, level of cognitive impairment (BOMC score) and SF-12 physical score) and depression treatment variables (antidepressant medication at baseline and/or follow-up and psychosocial treatment at follow-up) were also considered for the full multivariate model. Stepwise selection by the Bayesian information criterion (BIC)[52] was used to assist with model reduction. All calculations were performed using SAS 9.1.

Results

Recruitment of family physicians

Of the 375 FPs who were invited to participate in the study, 119 (31.7%) could not be contacted by the RA. Of the remaining 256 FPs, 146 were ineligible (either because their practice location was outside our 30-minute travelling area, contrary to what was listed, or because the nature of their patients or type of practice did not meet the study objectives). Of the 110 potentially eligible FPs, consent to participate was received from 63 individuals (57.3%). One or more screening forms were returned by 41 out of 63 (65%) of these FPs' practices.

Recruitment of patients

Of 254 patients whose completed screening forms were returned by the 41 practices, 98 (39%) were eligible for and interested in study participation (38 patients (15%) could not later be reached by telephone, 51 patients (20%) were no longer interested and 67 patients (26%) were not eligible) (see Figure 1).

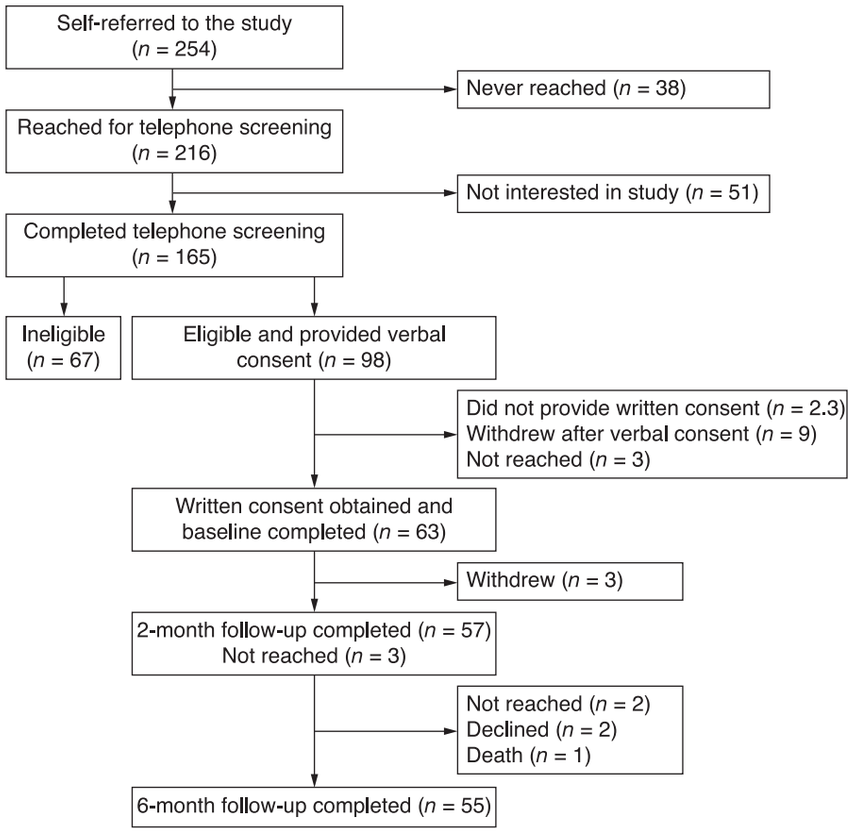

Figure 1 Results of patient screening, recruitment and follow-up

The reasons for ineligibility were no target chronic disease (9 patients), inability to read either English or French (5 patients), visual or physical impairment (3 patients), cognitive impairment (13 patients), a PHQ-9 score of < 5 (23 patients), currently receiving counselling (11 patients), and suicidal plans (3 patients). (The suicidal patients were referred to their FP and community suicide services.)

Of the 98 patients who were interested in and eligible for participation in the study, 63 (64%) returned a signed consent form. The numbers of signed consent forms did not differ significantly by age, gender or PHQ-9 score. Of the 63 participants, 100% completed the baseline interview, 90% (57 patients) completed the 2-month follow-up, and 87% (55 patients) completed the 6-month follow-up interview. Reasons for non-completion were death (1 patient) and withdrawal or refusal (5 patients); the remainder could not be contacted within the time window for the follow-up. No patients became suicidal during the follow-up.

The characteristics of the participants are listed in Table 1. Older participants were more likely to have had a longer relationship with their FP. Although other differences by age were not statistically significant, older patients unexpectedly tended to have lower rates of mild cognitive impairment and lower rates of health services utilisation than middle-aged participants, and a similar level of physical health status (as assessed by the SF-12 PCS).

Patient adherence to and perceptions of the intervention

Table 2 shows the patients' use of the self-care tools and completed coach calls at the 2-month follow-up. Participants' use of the intervention was highest for the video/DVD and lowest for the Internet programmes. These rates did not differ with age group or PHQ-9 score.

At the 6-month follow-up, about half of the participants reported that all of the tools had been helpful except for the Internet programmes, which were used much less (see Table 3). Overall, 84% of the participants reported that at least one tool had been helpful. There were significant differences by age group in both the use and perceptions of the Antidepressant Skills Workbook and the Mood Monitoring Notebook, indicating that whereas fewer of the older participants found the Workbook helpful, more of them found the Mood Monitoring Notebook helpful, compared with younger participants. Participants with a lower PHQ-9 at baseline (< 15) were more satisfied with the intervention, and more of them rated the coach calls as important, compared with the participants with higher scores.

Those who found the behavioural tools helpful indicated that seeing information in a written form provided them with both direction (e.g. 'It gave me procedures to follow', 'It motivated me a lot to plan my day and arrange my life priorities') and insight (e.g. 'It helped me to pinpoint specific times in the day when specific things made me feel the way I was feeling', 'It let me detect when I was going to feel depressed and figure out ways to improve my mood', 'I learnt that things always look bigger than they are in reality'). Participants who did not find these tools helpful identified a conflict between their own preferences and the nature of these tools (e.g. 'I am not good at writing things down', 'I find talking better than reading'). Positive comments on the information leaflet indicated that it clarified patients' understanding of depression, although some individuals commented that they already knew the information. Participants found the video/DVD helpful because the testimonials helped them to see that depression was a 'normal thing in life.' However, others said that they preferred reading. Although few participants found the Internet programmes helpful, one participant reported that this was the main tool that he used. Other participants found that these programmes were too complicated or stressful to use.

Clinical outcomes

There were statistically significant decreases from baseline to 6 months in the PHQ-9 score, the proportion of participants who were using antidepressant medications, and alcohol consumption by the participants (see Table 4). The Mental Component Summary score increased (indicating improvement), as did the frequency of social contacts. Notably, similar changes were seen among younger and older participants, and by initial PHQ-9 group. In response to direct questions about behaviour changes, 58% of the participants reported that they had made changes by eating a healthier diet, taking exercise, and making time for rewarding activities, 33% of the participants reported changes in social activities, and 23% reported making changes to improve their adherence to medication (data not shown).

The measures of clinical significance on the PHQ-9 change ($n = 53$) indicated that 57% (95% CI: 43%, 70%) of the participants showed at least a 50% decline in their score; the overall effect size was 0.88 (95% CI: 0.55, 1.14). Of the patients whose initial PHQ-9 score was ≥ 10 ($n = 35$), 54% (95% CI:

Table 1 Characteristics of the study sample at baseline, by age group

Characteristic	Overall ($n = 63$)	Age < 60 years ($n = 30$)	Age ≥ 60 years ($n = 33$)	P-value (χ^2 test)
Sociodemographic				
Median age (range)	61 (42)			
Female (%)	74.6	76.7	72.7	0.720
Lives alone (%)	30.2	20.0	39.4	0.094
Married/common-law (%)	44.4	46.7	42.4	0.735
High-school education or more (%)	82.5	86.7	78.8	0.411
Born in Canada (%)	76.2	76.7	75.8	0.933
French-speaking (%)	52.4	53.3	48.5	0.885
Low income (%)	27.5	30.8	24.0	0.588
Health measures				
Chronic disease diagnoses				
Asthma (%)	33.3	33.3	33.3	1.00
Chronic obstructive lung disease (%)	30.2	23.3	36.4	0.333
Diabetes (%)	30.2	26.7	33.3	0.565
Hypertension (%)	69.8	63.3	75.8	0.283
Heart disease (%)	20.6	10.0	30.3	0.138
Arthritis (%)	36.5	33.3	39.4	0.307
Number of chronic diseases				0.056
2 chronic diseases (%)	33.3	33.3	33.3	
≥ 3 chronic diseases (%)	22.2	10.0	33.3	
Mean PHQ-9 score (SD)	12.4 (5.0)	13.1 (4.9)	11.9 (5.1)	0.350*
Mean SF-12 mental summary (MCS) (SD)	39.4 (10.9)	37.4 (10.7)	41.3 (10.9)	0.162*
Mean SF-12 physical summary (PCS) (SD)	40.3 (11.1)	40.6 (10.6)	40.1 (11.7)	0.877*
Depression diagnosis:				0.780
Major depression (%)	31.8	33.3	30.3	
Other depression (%)	23.8	26.7	21.2	
Panic disorder (%)	20.6	23.3	18.2	0.614
Other anxiety disorder (%)	33.3	40.0	27.3	0.285
Somatoform disorder (%)	47.6	56.7	39.4	0.170
Alcohol abuse (%)	24.2	31.3	17.7	0.362
Mild cognitive impairment (%)	17.5	23.3	12.1	0.242
Mean total number of medications (SD)	5.5 (3.3)	4.8 (3.6)	6.2 (2.9)	0.093*
Antidepressant medications				0.325
Current (%)	33.3	28.6	37.9	
Previous only (%)	33.3	42.9	24.1	
Previous psychological treatment (%)	58.2	64.3	51.9	0.350
Health services utilisation				
Hospitalisation in past 12 months (%)	21.0	30.0	12.5	0.091
Emergency department visits in past 3 months (%)	21.0	26.7	15.6	0.286
Homecare services in past 30 days (%)	15.9	23.3	9.1	0.122
Same family physician for ≥ 10 years (%)	58.1	43.3	71.9	0.035

* *t*-test.

Table 2 Adherence to intervention at 2-month follow-up

Measure	2-month follow-up (n = 57)
Use of informational tools	
Information brochure	
Tried *n* (%)	36 (63.1)
Tried and completed at least half *n* (%)	23 (40.4)
Internet programmes	
Tried *n* (%)	6 (10.6)
Tried and completed at least half *n* (%)	4 (7.0)
Video/DVD	
Tried *n* (%)	37 (64.9)
Tried and completed at least half *n* (%)	35 (61.4)
Mean use of informational tools	
Minimal (< 1)	14 (24.6)
Moderate (1–2)	30 (52.6)
High (3–5)	13 (22.8)
Use of behavioural tools	
Action plan	
Tried *n* (%)	33 (57.9)
Tried and completed at least half *n* (%)	21 (36.8)
Antidepressant Skills Workbook	
Tried *n* (%)	32 (56.1)
Tried and completed at least half *n* (%)	18 (31.6)
Mood Monitoring Notebook	
Tried *n* (%)	37 (64.9)
Tried and completed at least half *n* (%)	15 (26.3)
Mean use of behavioural tools	
Minimal (< 1)	20 (35.1)
Moderate (1–2)	22 (38.6)
High (3–5)	15 (26.3)
Coaching	
Mean completed coach calls (SD)	5.7 (2.4)
Mean duration of coach calls (minutes) (SD)	11.7 (4.4)

38%, 71%) showed at least a 50% decline in their score; the effect size was 1.0 (95% CI: 0.60, 1.60).

Only three participants (5%) were observed either by interviewers or coaches to show a temporary worsening of depression symptoms during follow-up. Two of these individuals were brought to the attention of their FPs after their consent had been obtained; the third participant spoke to the study psychiatrist, who encouraged that patient to speak to their FP. None of the participants developed suicidal plans.

Predictors of clinical outcomes

The regression models found that a higher initial PHQ-9 score predicted a greater 6-month decline in the PHQ-9 score. After adjustment for PHQ-9 score, age, baseline SF-12 physical component summary score and gender were not associated with the change in PHQ-9 score (see Table 5). Cognitive impairment predicted less decline in the PHQ-9 score in the multivariate model.

At least moderate use of the behavioural tools at the 2-month follow-up was associated with a significantly greater decline in depressive symptoms compared with minimal adherence. Use of the informational tools and the number of coach contacts were not associated with decline in PHQ-9 score. Although both continued use of antidepressant medications from baseline to follow-up and initiation of psychological therapy were associated with an increase in the PHQ-9 score, after adjustment for baseline PHQ-9 score, these treatment measures did not contribute to the final model and were excluded (see Table 5).

Discussion

We have reported on a study of the feasibility and acceptability of implementing a telephone-supported self-care intervention for depression among depressed adults aged 40 years or over with comorbid chronic physical illnesses being treated in primary care. Overall we found that just over one-third of eligible FPs were able to implement the screening process in their practices. Among the participating patients, the intervention was feasible, acceptable, safe, and accompanied by a significant improvement in depressive symptoms across the different age groups and levels of depressive symptoms.

Feasibility

Physicians

The greatest barriers to feasibility of the intervention were identifying interested FPs and implementing the office-based screening procedures. Although the initial participation rate among eligible FPs was 57.3%, similar to that reported in other primary care studies,[53] only two-thirds of the participating practices returned screening forms. The reasons for the low participation rate may include lack of interest in mental health or self-care, lack of interest in research, or lack of infrastructure to implement the screening.[54] In future research on self-care, different strat-

Table 3 Adherence to and acceptability of intervention at 6-month follow-up by age and initial PHQ-9 score

Measure	Overall ($n = 55$)	Age < 60 years ($n = 24$)	Age ≥ 60 years ($n = 31$)	χ^2 *P*-value	PHQ9 < 15 ($n = 38$)	PHQ9 ≥ 15 ($n = 17$)	χ^2 *P*-value
Informational tools							
Information brochure[a]				0.397*			0.259*
Did not try *n* (%)	2 (3.7)	0 (0.0)	2 (6.5)		1 (2.7)	1 (5.9)	
Tried, did not find helpful *n* (%)	22 (40.7)	12 (50.0)	11 (35.5)		13 (35.1)	9 (52.9)	
Tried, found helpful *n* (%)	30 (55.6)	12 (50.0)	18 (58.0)		23 (62.2)	7 (41.2)	
Internet programmes				1.000*			0.304*
Did not try *n* (%)	41 (74.6)	18 (75)	23 (74.2)		30 (79)	11 (64.7)	
Tried, did not find helpful *n* (%)	5 (9.1)	2 (8.3)	3 (9.7)		2 (5.3)	3 (17.7)	
Tried, found helpful *n* (%)	9 (16.4)	4 (16.7)	5 (16.1)		6 (15.8)	3 (17.7)	
Video/DVD[a]				0.380			0.074*
Did not try *n* (%)	13 (24.1)	7 (30.4)	6 (19.4)		10 (27.0)	3 (17.7)	
Tried, did not find helpful *n* (%)	14 (25.9)	7 (30.4)	7 (22.6)		6 (16.2)	8 (47.1)	
Tried, found helpful *n* (%)	27 (50.0)	9 (39.1)	18 (58.1)		21 (56.8)	6 (35.3)	
Any informational tool found helpful *n* (%)	39 (70.9)	15 (62.5)	24 (77.4)	0.227	30 (79)	9 (52.9)	0.062*
Behavioural tools							
Action plan[a]				1.000*			0.098*
Did not try *n* (%)	17 (31.5)	8 (33.3)	9 (30.0)		10 (27.0)	7 (41.2)	
Tried, did not find helpful *n* (%)	7 (13.0)	3 (12.5)	4 (13.3)		3 (8.1)	4 (23.5)	
Tried, found helpful *n* (%)	30 (55.5)	13 (54.2)	17 (56.7)		24 (64.5)	6 (35.3)	
Antidepressant Skills Workbook[b]				**0.015***			0.224*
Did not try *n* (%)	17 (32.1)	3 (13.0)	14 (46.7)		11 (29.7)	6 (37.5)	
Tried, did not find helpful *n* (%)	8 (15.1)	6 (26.1)	2 (6.6)		4 (10.8)	4(25.0)	
Tried, found helpful *n* (%)	28 (52.8)	14 (60.9)	14 (46.7)		22 (59.5)	6 (37.5)	

Table 3 Continued

Mood Monitoring Notebook				**0.025***			0.615
Did not try *n* (%)	18 (32.7)	7 (29.2)	11 (35.5)		14 (36.8)	4 (23.5)	
Tried, did not find helpful *n* (%)	8 (14.6)	7 (29.2)	1 (3.2)		5 (13.2)	3 (17.7)	
Tried, found helpful *n* (%)	29 (52.7)	10 (41.7)	19 (61.3)		19 (50)	10 (58.8)	
Any behavioural tool found helpful *n* (%)	42 (76.4)	18 (75)	24 (77.4)	0.834	31 (81.6)	11 (64.7)	0.190*
Any tool found helpful *n* (%)	46 (83.6)	19 (79.2)	27 (87.1)	0.482*	34 (89.5)	12 (70.6)	0.116*
Coaching							
Mean number of completed coach calls (SD)	10.5 (4.0)	9.9 (3.9)	11.1 (4)	0.272**	10.9 (3.6)	9.8 (4.6)	0.332**
Mean duration of coach calls (minutes) (SD)	10.6 (3.7)	11.0 (4.2)	10.4 (3.3)	0.580	10.4 (4.1)	11.2 (2.4)	0.401
Coach calls were important *n* (%)	48 (90.6)	21 (91.3)	27 (90)	0.358*	35 (97.2)	13 (76.5)	**0.032***
Could have used tools without coach *n* (%)	24 (47.1)	13 (56.5)	11 (39.3)	0.220	16 (44.4)	8 (53.3)	0.562
Satisfaction (CSQ-8) mean (SD)	25.1 (5.5)	25.2 (4.5)	25.1 (6.3)	0.983**	26.2 (4.9)	22.8 (6.1)	**0.034****

* Fisher's exact test.
** *t*-test.
[a] 1 missing.
[b] 2 missing.

Table 4 Changes in clinical outcomes from baseline to 6-month follow-up ($n = 55$)

Outcome variables	(Missing)	Baseline	Six-month follow-up	*P*-value*
Depression diagnosis	(2)			0.001
None (%)		47.2	71.7	
Minor depression (%)		18.9	7.6	
Major depression (%)		34.0	20.8	
Mean depression severity (PHQ-9) (SD)	(2)	12.4 (5.3)	6.8 (6.3)	< 0.0001
SF-12				
Mean mental summary (MCS) (SD)	(3)	39.0 (11.2)	45.2 (12.9)	< 0.0001
Mean physical summary (PCS) (SD)	(3)	41.4 (11.0)	41.9 (11.0)	0.710
Mean activation (SD)	(15)	60.4 (13.6)	62.2 (14.4)	0.468
Daily activities				
Mean social activities (SD)	(3)	11.0 (7.0)	13.3 (7.4)	0.042
Mean solitary activities (SD)	(3)	6.1 (3.7)	6.6 (3.9)	0.487
Mean productive activities (SD)	(3)	4.6 (3.6)	4.9 (3.6)	0.563
Mean exercise (SD)	(4)	5.0 (4.7)	4.4 (3.4)	0.338
Cigarette smoking	(1)			0.320
Does not smoke		79.6	83.3	
Smokes < 10 cigarettes per week		3.7	1.8	
Smokes ≥ 10 cigarettes per week		16.7	14.8	
Alcohol consumption	(17)			0.007
Does not drink		34.2	47.4	
1–6 drinks per week		44.7	39.5	
≥ 7 drinks per week		21.1	13.2	
Medication adherence	(3)			0.075
0 (adherent)		57.7	76.9	
1		25.0	5.8	
≥ 2 (non-adherent)		17.3	17.3	
Antidepressant medication use	(2)	32.1	20.8	0.006
Emergency department visits in past 3 months		17.7	19.6	0.739
Counselling or therapy	(2)		20.7	

*Generalised estimating equations (GEE) methodology was used to study the relationship of the change in time for each variable.

egies may be needed to recruit patients, such as better preparation of FPs before the study (e.g. by providing educational materials, and lectures on self-care as part of rounds), allowing FPs to refer patients directly to the study, direct mailing of self-screening forms to patients with chronic diseases, or placing research staff in FP offices to screen patients.

Patients

Recruitment of patients was generally feasible. The main barrier that we encountered in our telephone-based recruitment process was in obtaining written informed consent. In future, we recommend an initial face-to-face meeting with the patient to explain the study, request their informed consent and deliver the self-care tools. It was also feasible to complete most of the planned coaching telephone

Table 5 Linear regression models of associations between baseline measures, adherence to interventions, depression treatment and change in PHQ-9 score at 6-month follow-up ($n = 51$)

		Univariate models			Multivariate models*			Multivariate model		
	n	Beta	95% CI	*P*-value	Beta	95% CI	*P*-value	Beta	95% CI	*P*-value
*Baseline measures******										
PHQ-9 (5-point increase)	51	–3.0	–4.7, –1.4	**< 0.001**	–3.0	–4.7, –1.4	**<0.001**	–3.6	–5.1, –2.0	**< 0.001**
Cognitive impairment (1-point increase)	51	0.5	–0.2 , 1.3	0.162	0.7	0.1, 1.4	**0.031**	0.7	0.1, 1.3	**0.030**
SF-12 physical (1-point increase)	51	0.0	–0.2, 0.2	0.885	–0.1	–0.2, 0.1	0.351			
Age (years)										
< 60	23	0.0			0.0					
≥ 60	28	–1.0	–4.8, 2.9	0.620	–1.6	–5.1, 1.8	0.346			
Gender										
Female	36	3.2	–0.9, 7.3	0.128	3.4	–0.2, 7.1	0.064			
Male	15	0.0			0.0					
Intervention adherence										
Informational tool use (mean)										
Minimal (< 1)	11	0.0			0.0					
Moderate (1–2)	28	–1.2	–6.1 , 3.8	0.639	–0.9	–5.2, 3.4	0.671			
High (3–5)	12	–2.8	–8.6 , 3.0	0.335	–3.5	–8.5, 1.6	0.179			
Behavioural tool use (mean)										
Minimal (< 1)	15	0.0			0.0			0.0		
Moderate (1–2)	21	–5.5	–9.9 , –1.0	**0.017**	–5.4	–9.2, –1.6	**0.006**	–5.4	–9.0, –1.7	**0.005**
High (3–5)	15	–3.5	–8.3 , 1.3	0.153	–5.8	–10.1, –1.6	**0.008**	–5.4	–9.5, –1.3	**0.012**
Number of completed coach contacts	51	0.0	–0.5, 0.4	0.869	–0.1	–0.5, 0.3	0.608			

Table 5 Continued

Depression treatment							
Antidepressant medication							
At both baseline and 6 months	10	4.4	–0.5, 9.2	0.075	4.0	–0.2, 8.3	0.064
Only at baseline	6	–0.3	–6.2, 5.7	0.930	–1.6	–6.8, 3.7	0.556
Neither	35	0.0			0.0		
Psychosocial at 6 months							
No	40	0.0			0.0		
Yes	11	3.5	–1.1, 8.1	0.132	4.1	0.1, 8.1	**0.045**

95% CI, 95% confidence interval.
* Each model is adjusted for baseline PHQ-9 score.

calls; an average of 10.5 calls per patient (out of a possible maximum of 15) were completed.

Acceptability of the intervention

Our findings on the use and perception of depression self-care tools are particularly rich, as patients were provided with a range of depression self-care tools, including those with informational and behavioural content, delivered using a range of educational technologies (paper-based, Internet and audio-visual). Overall, we found that all of the tools except the Internet programmes were perceived to be helpful by around 50% of the study participants; only 7% found the Internet tools to be acceptable. Almost all of the participants reported that the coaching was helpful.

Older participants were less likely to report that the Antidepressant Skills Workbook was helpful, but more likely to find the Mood Monitoring Notebook helpful. The Antidepressant Skills Workbook was the longest of the behavioural tools, requiring the most reading. The Mood Monitoring Notebook, in contrast, was relatively simple to complete. These findings should be interpreted cautiously because of the small sample size and the unexpected finding that older patients were no more ill and used (non-significantly) fewer health services than middle-aged patients. This suggests that older patients who were more ill and using more health services may have been less likely to participate in the study. Nevertheless, further research is needed on the differences between older and middle-aged patients in their self-care needs and preferences, and on how to engage more ill older adults in depression self-care interventions.[55]

Despite some concerns raised by health professional focus group members early in the study,[56] our results also suggest that older adults and more severely depressed patients (including those with major depression and/or currently receiving antidepressant medication) can also benefit from this approach. The intervention did not appear to have any negative effects; the small number of cases of worsening depression improved quickly. Therefore we conclude that the intervention is safe as an adjunct to usual care, even among older or more severely depressed patients, if it is accompanied by frequent monitoring of patients as in our study.

Further development of depression self-care interventions will require the adaptation of tools and approaches to meet the needs of different populations. From patients' comments it appeared that individuals who did not use the behavioural tools preferred other means of receiving help. For example, some suggested that they were 'not the writing type.' Adding other tools (e.g. relaxation video, audio recordings) may provide these individuals with alternative means of participating in self-care.

Among the intervention components that we examined, only use of the behavioural tools was associated with a decline in depressive symptoms; neither use of informational tools nor number of coach contacts were associated with the depression outcome. In future, the number of coach calls might be tailored to individuals' preferences. These results suggest that efforts should be made to increase adherence to the behavioural tools.

Clinical outcomes

Although the primary focus of this study was on the feasibility and acceptability of the intervention, we found promising results in terms of the clinical outcomes. Among those with clinically significant symptoms, the overall effect size (regardless of adherence) is similar to those reported for other low-intensity psychological interventions,[57–59] and for another telephone-supported self-care intervention for depression.[60] Stronger effects might be expected from an intervention that encourages use of the behavioural tools.

Patients with higher initial PHQ-9 scores improved more than those with lower initial scores. Importantly, the improvement in PHQ-9 score was not affected by age, gender or physical health status. However, an increased level of cognitive impairment predicted a small increase in severity of depression over time. Self-care interventions may need to be adapted to the needs of patients with mild cognitive impairment.

Other depression-related measures were also found to have changed significantly at the 6-month follow-up (the SF-12 mental component summary score and use of antidepressant medications). Our findings with regard to the relationship between treatment for depression and change in PHQ-9 score (see Table 5) suggest that both continued antidepressant medication use and initiation of psychological/counselling therapy during the study were associated with worsening of depressive symptoms.

Although the majority of the participants reported that they had made changes in health behaviours (particularly eating a healthier diet, taking exercise and making time for rewarding activities) at the 6-month follow-up, these changes were not reflected in the pre–post behaviour change measures, perhaps due to lack of responsiveness of the behaviour measures, issues of social desirability, or a response shift bias.[61] The level of patient activation also did not change over time, which is similar to previous research findings.[62]

Limitations of the study

Limitations of this study include potential selection bias in FP and patient participation, the use of self-reported outcomes that are subject to recall and social desirability biases, a possible non-specific 'attention' effect of the coach,[63] and failure to use a period of 'watchful waiting', which may explain in part the improvement in depression outcomes.[13,64] The better clinical outcomes found among patients who selected and adhered to the behavioural tools may be confounded by greater motivation or other unmeasured characteristics. The differences by age and depression severity should be interpreted with caution, as the sample was small and underpowered to detect clinically significant differences. Finally, because this study did not randomise the participants, and staff were not blinded to treatment allocation or to the use of specific self-care tools, the results should not be interpreted as evidence of effectiveness.

Conclusions

In an open uncontrolled trial, we found that a telephone-supported self-care intervention for depression was feasible and acceptable to patients with chronic physical illnesses, and possibly associated with improvements in clinical outcomes. Importantly, these findings were generally similar across age groups and among those with more severe depressive symptoms. A randomised trial to determine the effectiveness of the intervention is warranted.

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ETHICAL APPROVAL

The study protocol and consent procedures were approved by the St Mary's Hospital Research Ethics Committee.

CONFLICTS OF INTEREST

None.

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ADDRESS FOR CORRESPONDENCE

Jane McCusker MD DrPH, Department of Epidemiology, Biostatistics and Occupational Health, McGill University; St Mary's Research Centre, Hayes Pavilion, Suite 3734, 3830 Avenue Lacombe, Montreal, PQ H3T 1M5, Canada. Tel: 514 345 3511 x5062; fax: 514 734 2652; email: jane.mccusker@mcgill.ca

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