Author: A'Campo, Laura Eva Ingeborg
Title: A patient and caregiver education program : in Parkinson's disease, Huntington's disease, and other chronic diseases
Issue Date: 2012-06-05

9

A patient education program to diminish depression and anxiety in chronic disease

Authors: L.E.I. A'Campo*, MSc[1]; N.G.A. Spliethoff-Kamminga, PhD[1]; R.A.C. Roos, MD, PhD[1]

Institutional affiliations: from the [1]Department of Neurology, Leiden University Medical Centre, Leiden, The Netherlands.

Submitted

Abstract

Objective: Chronic disease is often accompanied by psychological distress in both patients and caregivers. The Patient Education Program for patients with Chronic Disease and their caregivers (PEP-CD) was derived from an evidence-based program for Parkinson's disease. The aim of this pilot study is to assess if the PEP-CD in chronically ill patients with co-morbid psychiatric problems and their caregivers is feasible to improve coping and thereby diminishing depression and anxiety.

Methods: Twenty-eight patients and 14 caregivers participated in the standardized program of eight two-weekly sessions of 90 minutes. Assessments on anxiety and depression (HADS); psychosocial burden and need for help (BELA-P/A-k); mental and physical quality of life (SF-36,); general quality of life (EQ-5D); and coping (UCL) were performed within two weeks before and two weeks after the program. Participants rated their mood before and after each session (Mood-VAS) and filled in a final evaluation questionnaire.

Results: Depression and anxiety in the patients group significantly improved. Furthermore, they reported less burden by psychosocial problems, less psychosocial need for help, better mental quality of life, better health state and more use of 'Seeking social support' as coping. Caregivers reported less need for psychosocial help and a better general quality of life after participation.

Conclusions: Patients suffering from chronic disease with co-morbid psychiatric disease and their caregivers benefit from participation in the PEP-CD. The program was feasible to reduce depression and anxiety in the patients back to normal. A randomized controlled trail is needed to assess its effectiveness further.

Introduction

The worldwide increase of life-expectancy is accompanied with an increase of chronic disease. In chronic disease, treatment is symptomatic and aimed at improving adaptation and maximizing patients' quality of life (Qol). Patients have to learn to cope with physical problems and disability and to adjust their activities of daily life, work and social participation to their decreased functional abilities.

Living with a chronic disease is accompanied by psychological distress[1] and poses patients at risk for developing depression and anxiety.[2] Wells, Golding and Burnam found that in chronically ill patients, the sex- and age-adjusted prevalence of psychiatric disorders was 24.7% and of lifetime psychiatric disorder even 42.2%, compared to 17.5% and 33.0%, respectively, for persons without chronic disease.[3] In a recent study[4], a prevalence rate of mental disorder was found in 56.8% of patients with chronic disease versus 48.9% in healthy people. Prevalence was highest in neurological (76%) and hepatic diseases (76%), and lowest in cardiovascular disease (56%), and increased in patients with multiple chronic diseases.[4] Affective disorders are a risk factor for non-compliance in medical treatment[5] and long-term psychological stress can have detrimental effects on the physical health[6] and overall Qol.[1] Caregivers of chronically ill patients often experience long term strain including emotional, social and financial burden.[7] They have significantly higher rates of affective (6.3 % vs. 4.2%) and anxiety (17.5% vs. 10.9%) disorders than non-caregivers and use health services for mental health problems at nearly twice a rate.[8]

Emotional problems can be minimized by the use of psychological and social support.[9,10] Self-Management Intervention (SMI) is directed at strengthening these beneficial psychosocial resources in patients, caregivers or both[11] and therefore are important complementary to medical treatment.[12] SMIs are able to improve health status and health behaviour,[10,13] improve feelings of self-efficacy, reduce hospitalization after participation,[13] and limit health care costs.[14] Two applications of SMIs exist: 1) a disease-specific or 2) a generic approach. The latter is based on the premise that a generic set of skills is helpful in coping with all chronic diseases.[10] Lorig[13] proved with the Chronic Disease Self-Management Program (CDSMP) that it is feasible and effective to place patients with different chronic diseases in the same program; however the results could not be replicated in a study in the Netherlands, where the program was applied to older chronically ill patients.[15]

The Patient Education Program for Parkinson's disease (PEPP) is a disease-specific SMI. It was developed and evaluated on its feasibility in seven European countries[16-18] and on its effectiveness.[19,20] In the Netherlands, the program showed benefits for patients' Qol and caregivers' psychosocial problems and need for help.[19] Characteristics of the PEPP are a parallel program for patient and caregiver and a detailed manual in several languages including Dutch and English.[21-22] Furthermore, the PEPP focuses on general coping skills and might be applicable in other chronic diseases. Therefore the PEPP was transformed to a Patient Education Program for Chronic Disease (PEP-CD). The protocol uses cognitive behavioural techniques which have the potential to reduce psychological problems, like depression and anxiety.[10,23-25] However, a common problem in SMI studies is that psychological problems do not significantly improve because of minimal depressive complaints of participants at baseline.[10,19] Therefore the hypothesis is that the PEP-CD is especially effective in chronically ill patients with co-morbid psychiatric disease, mostly depression and anxiety disorders, because they may need this intervention most. The aim of this study is to assess if the PEP-CD in chronically ill with co-morbid psychiatric disease is feasible to diminish depression and anxiety.

Methods

Participants

Twenty-eight patients with chronic diseases and co-morbid psychiatric disease and 14 caregivers were included (Table 1). Patients were diagnosed with 17 different chronic diseases: Multiple Sclerosis; Becker's Muscular Dystrophy; Complex Regional Pain Syndrome; Parkinson's disease; Myasthenia Gravis; Post-Whiplash Syndrome; Cerebrovascular Accident; Crohn's disease; Scoliosis; Diabetes Mellitus; Neurofibromatosis; Cerebral Ataxia; Fibromyalgia; Chronic Hepatitis C; Pituitary Adenoma; Kidney disease; and Myalgic Encephalomyelitis. Furthermore, patients were diagnosed according to the Diagnostic and Statistical Manual of Mental Disorders (DSM).[26]

The patients in this study were all under treatment at the outpatient Medical Psychiatric Centre (MPC) 'PsyToBe'. The MPC offers psychiatric treatment including the PEP-CD to patients with a chronic disease with co-morbid psychiatric disease. Patients were referred to the program by their psychologist or psychiatrist, in case of acceptance or adaptation problems with regard to their disease and/or inadequate coping strategies and being able to participate in a group. During the program, no individual psychotherapy was provided. Medication was only changed if necessary (Table 1). Partners, if present, were asked to participate in the caregiver group. PEP-CD groups run between August 2007 and December 2009 were included in the study. Participants were included in order of registration. All participants signed informed consent.

Table 1 Demographics and clinical characteristics of the participants

	Patients (n = 28)	Caregivers (n=14)
Women, n	18	7
Age, mean years (SD)	46.1 (13.1)	51.7 (8.4)
Having a relationship, n	19	14
Partner in program,	14	14
Higher education level	10	7
Employed, n	7	10
Duration disease, mean years (SD)	10.6 (7.2)	
Use of psychotropic medication		
- AD	16	
- AP	2	
- AD + Benzo	4	
- AD +Slp	1	
- AD + AP + Slp	1	
- No medication	4	
Psychiatric diagnoses[3]		
Axis I		
- Depressive disorder	17	
- Adjustment disorder	7	
- Anxiety disorder	4	
- Pain disorder	1	
- Cognitive disorder NOS	2	
- Substance abuse	1	
- Substance related disorder NOS	1	
Axis II		
- No personality disorder	20	
- Borderline Personality Disorder	1	
- Delayed diagnosis	7	
Axis IV		
- Primary support group	13	
- Social environment	11	
- Occupational	11	
- Financial/other	1/1	
Axis V		
GAF score 41-50/51-60/61-70[4]	6/18/4	

Abbreviations: AD, antidepressants; AP, antipsychotics; Benzo, benzodiazepines; Slp, sleep medication; NOS, not otherwise specified; GAF, Global Assessment of Functioning. 1 Changes in medication <3 months before study: no changes (n = 22); new AD use (n = 2); AD dose reduced (n = 1); changes in AD use (n = 1); AD was stopped (n =1); start of AP unknown (n = 1). 2 Changes in medication during study: no changes (n = 17): AP/AD/Benzo dose was reduced (n = 4); AD dose was raised (n = 2); new AP use, but stopped again (n = 2); changes in AD use (n = 1); new Benzo use (n = 1); Slp dose reduced and raised again (n = 1). 3 Axis I: clinical disorders; Axis II: underlying personality conditions; Axis III: medical diagnoses, see 'Participants' section; Axis IV: Axis V: Global Assessment of Functioning. 4 A GAF score of 61–70 indicates some mild symptoms or some difficulty in social, occupational, or school functioning, but generally functioning pretty well, has some meaningful interpersonal relationships. 51–60: moderate symptoms or any moderate difficulty in social, occupational, or school functioning. 41–50: Serious symptoms or any serious impairment in social, occupational, or school functioning (26).

Intervention

The PEP-CD is a SMI focused on strengthening psychosocial resources of both patients and caregivers. The program uses techniques from the cognitive-behavioral therapy. Participants learn the following coping strategies within eight two-weekly sessions of 90 minutes duration: 1) taking a (pro) active role in treatment, seeking information about the disease; 2) self-monitoring of body, behavior, and mood; 3) performing pleasant activities and relaxation; 4) stress management by replacing unhelpful and unrealistic thoughts into helpful and realistic thoughts; 5) dealing with or preventing depression and anxiety; 6) social competence like communication and standing up for yourself; 7) asking for social support. Session 8 is an overall rehearsal and evaluation session.

The PEP-CD manual was derived from the PEPP manual,[21,22] which was originally developed for Parkinson's disease. Because of the generic approach in the PEPP, no major adaptations were needed: only examples specifically addressing Parkinson's disease were omitted. In this study, the PEP-CD manual was strictly followed, so the content was standardized across groups and the intervention can be easily replicated in follow-up studies. Patients and caregivers participated in separate, but parallel groups of 4-7 members at the MPC. Each group was led by two trainers (psychologists, or a social-psychiatric nurse).

Procedure and outcome measures

Patients and caregivers were asked to fill out validated self-report questionnaires twice at the MPC in the presence of a researcher (not working at the MPC): within two weeks before and within two weeks after the intervention. The Hospital Anxiety and Depression Scale (HADS),[27] provided summary scores for depression and anxiety separately. A score above 8 indicates a depression or anxiety disorder respectively.[28]

The 'Belastungsfragebogen Parkinson-kurzversion (BELA-P-k)'[29] and for the caregivers the 'Belastungsfragebogen Parkinson Angehörigen-kurzversion (BELA-A-k)' [30] measured the degree of being 'Bothered by' psychosocial problems and 'Need for help'. The scales were slightly adjusted by replacing 'Parkinson's disease' by 'chronic disease'.

Qol was measured with the 'Mental' and 'Physical' scale of the Short Form health survey questionnaire (SF-36)[29,30] and by the EuroQol-5D (EQ-5D)[31] utility score. The 100-point Visual Analogue Scale (VAS) of the EQ-5D measured current health state.

Coping behaviour was measured with the Utrecht Coping List (UCL).[34-36] Participants were asked to rate their present mood before and after each session on the 100-point Mood

Visual Analogue Scale (Mood-VAS).[37] After participation, participants filled in an evaluation questionnaire.[16,17]

Statistical analysis

The data were analysed with the Statistical Package for the Social Sciences (SPSS 16.0). The significance level used for all analyses was $p < 0.05$. Participants who attended less than six out of the eight sessions were considered as drop-out. Drop-outs and participants were compared at demographics and baseline scores (Mann-Whitney U Test or Pearson Chi-Square). The effects of the program were measured first by comparing pre- versus post-intervention scores of participants only, using paired-samples t-tests or Wilcoxon Signed Rank Tests. Secondly, analyses were repeated with linear mixed models (with unstructured covariance matrix) to estimate changes in scores with drop-outs included (intention to treat). Correlations were calculated between the difference scores on the HADS with the difference scores of the other outcome measures. To compare pre/post – session mood ratings, a linear mixed model with random participant effect, fixed patient/partner, fixed time and a fixed before-after session effect was performed for patients and caregivers together. The data from the evaluation questionnaire were analysed descriptively.

Results

Participants compared to drop-outs

During the study, seven patients and three partners dropped out of the program. Patients who dropped-out were diagnosed with their chronic disease a longer period of time ago than participants (Mean rank 21.3 versus 11.9; z = -2.55, p = .011) and significantly reported a better score on the SF-36 ‘Physical’ scale (Mean rank 19.9 versus 12.7; z = -1.99, p = .047) and EQ5D-VAS (Mean rank 20.1 versus 12.6; z = -2.11, p = .035). On the UCL, drop-outs significantly reported a higher score on the ‘Comforting cognitions’ scale (Mean rank 21.1 versus 12.3; z = -2.49, p = .013). In the caregiver group, no significant differences were found on the baseline scores between participants and drop-outs.

Changes in patients’ and caregivers’ scores

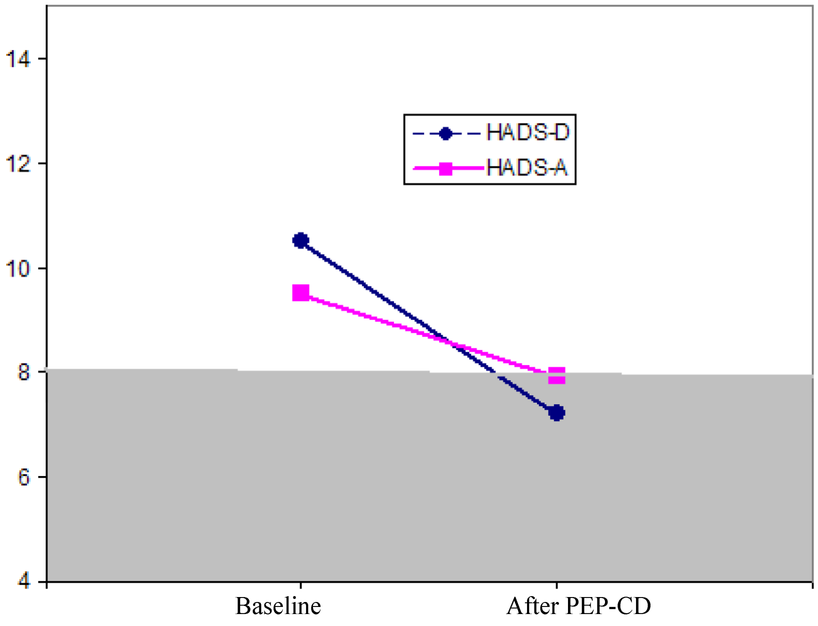
After participation in the program, patients’ scores significantly improved on the HADS-D (-3.2±3.3; t = 4.42, df = 20, p < .001) and HADS-A (-1.7±2.8; t = 2.76, df = 20, p = .012) (Figure 1, Table 2). Individual scores revealed improvement in 20 out of the 21 patients, of which nine improved to normal on HADS-D and one patient improved to normal on both HADS-D and HADS-A. Patients’ scores significantly improved on BELA-P-k ‘Bothered by’ (-7.3±9.0; t = 3.70, df = 20, p = .001) and ‘Need for help’ (-5.6±11.2; t = 2.31, df = 20, p = 0.031), SF-36 ‘Mental’ (5.5±10.6; t = ,-2.33, df =19, p = .031), but not on the SF-36 ‘Physical’ scale. Scores on the EQ-5D VAS improved (6.8±13.1; t =-2.38, df = 20, p = .028), but not on the ‘Utility’ scale. On the UCL, patients significantly reported more use of ‘Seeking social support’ after the program (1.7±1.8; t = -1.10, df = 19, p <.001). The repeated analyses (Table 3) with estimated change for drop-outs included showed the same results (slight differences in *p*-values), except for a non-significant change on the EQ-5D VAS. Caregivers’ scores (Table 3) showed significant improvements on the BELA-A-k ‘Need for help’ scale (-6.0±9.2; z = -2.04, p = .041) and the EQ-5D ‘Utility’ (0.1±0.1; z = -2.21, p =.027).

Table 2 Changes in patients' scores on the outcome measures

	Baseline Mean (SD) (n = 28)	Mean change (SD) (n =21)	p-value	Adjusted mean change (n = 28)	Adjusted p-value
HADS					
Depression	10.2 (3.9)	-3.2 (3.3)	<.001**	-3.1	<.001**
Anxiety	9.9 (3.9)	-1.7 (2.8)	.012*	-1.9	.003**
BELA-P-k					
Bothered by	36.0 (16.6)[1]	-7.3 (9.0)	.001**	-8.1[1]	<.001**
Need for help	40.1 (17.3)[1]	-5.6 (11.2)	.031*	-6.6[1]	.008**
SF-36					
Mental	38.3 (10.6)	5.5 (10.6)[2]	.031*	6.1	.011*
Physical	33.6 (10.6)	1.4 (7.5)[2]	.405	-1.5	.365
EQ-5D					
Utility	0.4 (0.3)	0.1 (0.3)	.053[2]	-	-
Visual Analogue Scale	48.9 (19.5)	6.8 (13.1)	.028*	5.2	.065
UCL					
Active coping	15.7 (4.0)	0.4 (2.9)[2]	.515	0.6	.369
Palliative reaction	18.2 (2.8)	-0.6 (2.0)[2]	.175	-0.4	.385
Avoidance	17.8 (4.7)	-1.4 (3.7)[2]	.110	-1.5	.059
Seeking social support	12.2 (3.1)	1.7 (1.8)[2]	<.001**	1.5	.003**
Passive reaction	15.1 (3.7)	-1.1 (2.9)[2]	.113	-1.0	.114
Negative emotion expression	6.2 (2.1)[1]	0.4 (1.6)[2]	.413[3]	-	-
Comforting cognitions	11.0 (2.8)	0.7(1.8)[2]	.117	0.4	.294

On the HADS and BELA-P-k, lower scores reflect less anxiety, depression, psychosocial problems or psychosocial need for help. On the SF-36 and EQ-D, a higher score reflects a better mental, physical, or general quality of life or health state. On the UCL, a higher score reflects more use of the particular coping strategy. Abbreviations: HADS, Hospital Anxiety and Depression Scale; BELA-P-k, Belastungsfragebogen Parkinson kurzversion; SF-36, 36-item Short Form health survey questionnaire; EQ-5D, EuroQol-5D; UCL, Utrecht Coping List. 1 n = 27, one patient was excluded because of too many missing values. 2 n = 20, one patient was excluded because of too many missing values. 3 Variable was not normally distributed. A Wilcoxon Signed Rank Test was used and no adjusted mean could be calculated.

Figure 1 HADS-Depression (HADS-D) and HADS-Anxiety (HADS-A) mean scores of patients (n = 21) at baseline and after PEP-CD



A score >8 indicates a depressive disorder or anxiety disorder. The grey area represents scores considered as normal.

Table 3 Changes in caregivers' scores on outcome measures

	Baseline mean (SD) (n = 14)	Mean change (SD) (n = 11)	p-value[1]
HADS			
Depression	3.9 (3.6)	-0.3 (2.9)	.796
Anxiety	6.4 (4.1)	-0.7 (2.1)	.230
BELA-A-k			
Bothered by	16.9 (9.6)	-3.8 (7.9)	.138
Need for help	21.8 (11.3)	-6.0 (9.2)	.041*
SF-36			
Mental	50.3 (12.9)	0.6 (15.0)	.248
Physical	48.9 (10.6)	0.5 (6.6)	.790
EQ-5D			
Utility	0.8 (0.2)	0.1 (0.1)	.027*
VAS	76.2 (17.5)	2.9 (15.5)	.888
UCL			
Active coping	20.4 (3.1)	0.8 (2.0)	.230
Palliative reaction	17.7 (3.3)	1.1 (2.8)	.277
Avoidance	14.4 (2.4)	1.3(3.4)	.253
Seeking social support	12.4 (3.1)	0.7 (2.2)	.257
Passive reaction	10.9 (2.7)	-0.4 (2.2)	.546
Negative emotion expression	6.2 (1.4)[2]	0.2 (2.4)	.570
Comforting cognitions	12.6 (2.7)	-0.4 (2.1)	.602

On the HADS and BELA-A-k, lower scores reflect less anxiety, depression, psychosocial problems or psychosocial need for help. On the SF-36 and EQ-D, a higher score reflects a better mental, physical, or general quality of life or health state. On the UCL, a higher score reflects more use of the particular coping strategy. Abbreviations: HADS, Hospital Anxiety and Depression Scale; BELA-A-k, Belastungsfragebogen Parkinson Angehörigen kurzversion; SF-36, 36-item Short Form health survey questionnaire; EQ-5D, EuroQol-5D; UCL, Utrecht Coping List. 1 Wilcoxon Rank tests were performed for all variables as non-parametric paired-samples tests because of non-normally distributed scores. 2 n = 13, one caregiver was excluded because of too many missing values.

Changes in mood before and after each session and program evaluation

Patients' and caregivers' mood significantly improved from pre- to post-sessions on the 100-point VAS (4.4±0.97; F = 20.44, df =37, p < .001). Mood also improved from session 1 to session 8 (8.3±1.80; t = 4.63, df = 445.3, p < .001). There was a significant effect for patient/caregiver: caregivers' mood was significantly higher during the program (13.8±5.9; t = -2.32, df = 34.01, p = .026).

Results from the evaluation questionnaire indicated positive evaluation of participation. The program increased understanding of psychological effects according to the patients as well as the caregivers (n = 29 out of 32), and helped most patients (n = 16 out of 21) to accept their chronic disease more.

Discussion

This pilot study showed significant and clinically relevant improvements of patients' depression and anxiety from a psychiatric level at baseline to a normal level after participation in the Patient Education Program for Chronic Disease (PEP-CD). Patients also experienced less burden by psychosocial problems and need for help; better mental quality of life (Qol); and more use of ‘seeking social support’ as a coping strategy. Caregivers were less in need for psychosocial help and reported a better general Qol afterwards.

The results confirm that the cognitive-behavioral techniques within PEP-CD have the potential to improve depression and anxiety. Also, the more frequent use of seeking social support in patients as a coping strategy may have contributed to the improvements because of its favorable direct and mediating effect on depression.[9]

Compared to the previous PEP-Parkinson’s disease studies,[16,17,19] patients in the present study did experience evident depression and anxiety at baseline, making more improvement possible. Also, in a recent meta-analysis on psychosocial interventions in cancer patients, it was concluded that effectiveness of interventions increase when patients with more psychological problems are included.[38]

Because of the baseline differences between present study and previous studies in PD, no conclusion can be drawn about difference in effectiveness between a disease-specific and generic approach of the program. As in the study of Lorig,[13] it was feasible and effective to apply SMI to heterogeneous groups of chronic diseases. The generic approach may have practical advantages, for example when many different patients are in treatment, especially in case of rare diseases. However, Lorig found benefits for a disease specific program for arthritis above the generic program.[39] Furthermore it is interesting if effectiveness and its endurance differ for type of chronic disease, regarding difference in disease course (i.e. progressive versus stable) and influence on central nervous system (CNS). Psychosocial consequences[10] and psychiatric prevalence differ per disease.[2,4] Also, CNS involvement in diseases like Parkinson’s disease, may influence development of psychiatric symptoms and may also cause cognitive deterioration, which may influence (endurance of) effectiveness of the program.

The difference in baseline scores between PEP-CD and PEPP[19] and many other SMI studies[10] is likely due to selection bias. Patients in this study were in psychiatric treatment because of psychological need for help. While in many SMI studies patients are recruited and may apply because of motivation to contribute to research in stead of really needing treatment.

In further comparison with previous PEPP studies, the caregivers improved again on psychosocial need for help after the program.[16,19] In the present study, the general quality of life (Qol) improved additionally, which is important because of the detrimental effects of caregiving on their wellbeing.[8] Overall, the caregivers' data were less consistent than the data of the patients, likely due to the small sample and relatively good baseline scores. Applying the program to caregivers with severe caregiver burden or psychiatric problems is of interest for future research. Also, the mutual influence between patient and caregiver is unknown; the caregivers may have contributed to the patients' improvements and these in turn may have lessened psychosocial need for help in the caregivers.

Practice implications

Based on our results, it is recommended to apply the program to chronically ill patients with evident depression or anxiety (HADS –A/D > 8) and caregivers with psychosocial need for help. Screening should proceed referring a patient or caregiver to the program. The program with group format may have advantages above individual psychotherapy or pharmacotherapy only, because it does not cause drug-drug interactions or drug side effects, it is less time and money consuming than individual psychotherapy and it can be provided by other health care professionals than psychotherapists, like trained social workers or social psychiatric nurses.

It could also be argued that providing the PEP-CD in an earlier stage of their chronic disease and before the onset of (severe) psychological problems could prevent severe psychological problems[38] by learning more helpful coping skills. In oncology patients, no preventive effects on anxiety and depression were found in baseline well-adjusted patients, but measurements did not include follow-up after more than seven months.[38] It may be necessary to assess participants several years later. Another argument to offer the program earlier on in the course of chronic disease is that patients who dropped out were diagnosed longer ago with the chronic disease (18 years versus 8.5 years in participants). It may be that the program was too much a burden for these patients as was reported for drop-out reason. However, these patients had better scores on health state, did not differ in psychological wellbeing, and used more comforting cognitions as a coping strategy. Education level was not lower in drop-outs in the present study contrary to findings of other psychological intervention studies.[41] In general, high drop-out is a problem in psychological treatment[42] and strategies are needed to retain participants in the program.

Limitations and recommendations for future research

This first evaluation study did include a small sample, which caused a lack of power. However, still many effects were found, especially in the patient group. Another limitation is the uncontrolled design of this study. No corrections for multiple testing were applied which caused an increase of chance of type I errors.

Conclusion

In conclusion, this pilot study indicated that patients suffering from chronic disease with co-morbid psychiatric disease and their caregivers benefit from participation in the PEP-CD. The program was feasible to reduce depression and anxiety in the patients back to normal. A randomized controlled trial is needed to assess its effectiveness further.

References

1. Shih M, Simon PA. Health-related quality of life among adults with serious psychological distress and chronic medical conditions. Quality of Life Research. 2008; 17:521-528
2. Polsky D, Doshi JA, Marcus S et al. Long-term risk for depressive symptoms after a medical diagnosis. Archives of Internal Medicine. 2005; 165:1260-1266
3. Wells KB, Golding JM, Burnam MA. Psychiatric disorder in a sample of the general population with and without chronic medical conditions. American Journal of Psychiatry. 1988; 145:976-981
4. Gili M, Comas A, Garcia-Garcia M et al. Comorbidity between common mental disorders and chronic somatic diseases in primary care patients. General Hospital Psychiatry. 2010; 32:240-245
5. DiMatteo MR, Lepper HS, Croghan TW. Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. Archives of Internal Medicine. 2000; 160:2101-2107
6. Katon W, Ciechanowski P. Impact of major depression on chronic medical illness. Journal of Psychosomatic Research. 2002; 53:859-863
7. Baanders AN, Heijmans MJ. The impact of chronic diseases: the partner's perspective. Family and Community Health. 2007; 30:305-317
8. Cochrane JJ, Goering PN, Rogers JM. The mental health of informal caregivers in Ontario: an epidemiological survey. American Journal of Public Health. 1997; 87:2002-2007
9. Bisschop MI, Kriegsman DM, Beekman AT et al. Chronic diseases and depression: the modifying role of psychosocial resources. Social Science and Medicine. 2004; 59:721-733
10. Newman S, Steed L, Mulligan K: Self-management interventions for chronic illness. Lancet. 2004; 364:1523-1537
11. Martire LM, Lustig AP, Schulz R et al. Is it beneficial to involve a family member? A meta-analysis of psychosocial interventions for chronic illness. Health Psychology. 2004; 23:599-611
12. Lorig K. Self-management education: more than a nice extra. Medical Care. 2003; 41:699-701

13. Lorig KR, Sobel DS, Stewart AL et al. Evidence suggesting that a chronic disease self-management program can improve health status while reducing hospitalization: a randomized trial. Medical Care. 1999; 37:5-14
14. Groessl EJ, Cronan TA. A cost analysis of self-management programs for people with chronic illness. American Journal of Community Psychology. 2000; 28:455-480
15. Elzen H, Slaets JP, Snijders TA et al. Evaluation of the chronic disease self-management program (CDSMP) among chronically ill older people in the Netherlands. Social Science and Medicine. 2007; 64:1832-1841
16. A'Campo LE, Spliethoff-Kamminga NG, Macht M, et al. Caregiver education in Parkinson's disease: formative evaluation of a standardized program in seven European countries. Quality of Life Research. 2010; 19:55-64
17. Macht M, Gerlich C, Ellgring H, et al. Patient Education in Parkinson's Disease: Formative evaluation of a standardized programme in seven European countries. Patient Education and Counseling. 2007; 65:245-252
18. Simons G, Thompson SB, Smith Pasqualini MC et al. An innovative education programme for people with Parkinson's disease and their carers. Parkinsonism and Related Disorders. 2006; 12:478-85
19. A'Campo LE, Wekking EM, Spliethoff-Kamminga NG et al. The benefits of a standardized patient education program for patients with Parkinson's disease and their caregivers. Parkinsonism and Related Disorders. 2010; 16:89-95
20. Tihonen S, Lankinen A, Viemero V. An evaluation of a Cognitive-Behavioral Patient Education Program for persons with Parkinson's Disease in Finland. Nordic Psychology. 2008; 60:316-331
21. Spliethoff-Kamminga NGA. Patiënt Educatie Programma Parkinson. Harcourt Publishers, Amsterdam, 2006
22. Smith Pasqualini MC, Simons G. Patient education for people with Parkinson's disease and their carers: a manual. John Wiley & Sons, Chichester, 2006
23. Secker DL, Brown RG. Cognitive behavioural therapy (CBT) for carers of patients with Parkinson's disease: a preliminary randomised controlled trial. Journal of Neurology, Neurosurgery and Psychiatry. 2005; 76:491-497
24. Farabaugh A, Locascio JJ, Yap L et al. Cognitive-behavioral therapy for patients with Parkinson's disease and comorbid major depressive disorder. Psychosomatics. 2010; 51:124-9

25. Butler AC, Chapman JE, Forman EM et al. The empirical status of cognitive-behavioral therapy: a review of meta-analyses. Clinical Psychological Review. 2006; 26:17-31
26. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text-revision (DSM-IV-TR). American Psychiatric Association, Washington DC, 2000.
27. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatrica Scandinavica. 1983; 67:361-70
28. Bjelland I, Dahl AA, Haug TT et al. The validity of the Hospital Anxiety and Depression Scale. An updated literature review. Journal of Psychosomatic Research. 2002; 52:69-77
29. Spliethoff-Kamminga NG, Zwinderman AH, Springer MP et al. Psychosocial problems in Parkinson's disease: evaluation of a disease-specific questionnaire. Movement Disorders. 2003; 18:503-509
30. Spliethoff-Kamminga NG, Zwinderman AH, Springer MP et al. A disease-specific psychosocial questionnaire for Parkinson's disease caregivers. Journal of Neurol. 2003; 250:1162-1168
31. Aaronson NK, Muller M, Cohen PD et al. Translation, validation, and norming of the Dutch language version of the SF-36 Health Survey in community and chronic disease populations. Journal of Clinical Epidemiology. 1998; 51:1055-1068
32. Ware JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Medical Care. 1992; 30:473-483
33. The EuroQol Group. EuroQol-a new facility for the measurement of health-related quality of life. Health Policy. 1990; 16:199-208
34. Schreurs PJG, Teilegen B, Van de Willige G. Health, stress and coping: the development of the Utrecht Coping List. Tijdschrift voor Psychologie. 1984; 12:101-117
35. Schaufeli W, Dierendock D. The reliability and validity of the Utrecht Coping List: A longitudinal study among school-leavers. Gedrag en Gezondheid. 1992; 20:38-45
36. Sanderman R, Ormel J. The Utrecht coping list: validity and reliability. Gedrag en Gezondheid. 1992; 20:32-37
37. Luria RE. The validity and reliability of the visual analogue mood scale. Journal of Psychiatric Research. 1975; 12:51-57

38. Schneider S, Moyer A, Knapp-Oliver S et al. Pre-intervention distress moderates the efficacy of psychosocial treatment for cancer patients: a meta-analysis. Journal of Behavioral Medicine. 2010; 33:1-14
39. Lorig K, Ritter PL, Plant K. A disease-specific self-help program compared with a generalized chronic disease self-help program for arthritis patients. Arthritis and Rheumatism. 2005; 53:950-957
40. Feingold A. Gender differences in personality: a meta-analysis. Psychological Bulletin. 1994; 116:429-456
41. Thoolen B, De Ridder D, Bensing J, Gorter K, Rutten G. Who participates in diabetes self-management interventions?. Issues of recruitment and retainment. Diabetes Education. 2007; 33:465-474
42. Wierzbicki M, Pekarik G. A Meta-Analysis of Psychotherapy Dropout. Professional Psychology Research and Practice. 2010; 24:190-195