Effects of Collaborative Care compared with care as usual on sustainable return to work for sick listed employees with Major Depressive Disorder: Results of a randomized controlled trial

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Abstract

Objectives. The purpose of the present study was to evaluate the effectiveness of the Collaborative Care (CC) model implemented in the Dutch occupational health care setting. CC was compared to Care As Usual (CAU) in terms of the time until sustainable Return To Work (RTW) in sick-listed employees with Major Depressive Disorder (MDD). The CC intervention was expected to promote faster sustainable RTW.

Methods. 126 Employees with a diagnosis of MDD sick listed between 4 and 12 weeks were included and followed up for 12 months. 65 Employees were randomized to the CC condition and 61 to the CAU. Employees in the CC condition received treatment from an Occupational Physician (OP)-care manager, according to a CC model, including a workplace adjustment module. In contrast, employees in the CAU condition only received sickness certification by their regular OP. Usual care was provided according to the OP guidelines of the Dutch Board for Occupational Medicine. Data on RTW was derived from OHS systems. Using Cox regression analyses, outcomes on RTW were compared between groups. A process evaluation was done to determine the degree to which the intervention was implemented.

Results. 64.6% of employees allocated to the CC and 59.0% of employees allocated to CAU sustainably returned to work within the 12 month follow up. However, CC was not superior to CAU, neither in terms of time until sustainable RTW, nor in total number of sick leave days during follow up. A process evaluation showed that just 66.7% (N = 40) of employees in the CC condition actually received treatment according to the CC model. Of these employees only 21.7% (N = 5) received the workplace adjustment intervention.

Conclusions. The non-significant difference between CC and CAU interventions may be explained by the extent to which the intervention has been implemented successfully. It is suggested that this may have been caused by OP/patient distrust but future research should clarify this point.

Samenvatting

Inleiding: Het doel van dit onderzoek was het evalueren van de effectiviteit van het Collaborative Care (CC) model geïmplementeerd in de Nederlandse bedrijfskundige gezondheidszorg. CC werd vergeleken met de gebruikelijke zorg (CAU) in de duur tot volledige duurzame terugkeer naar het werk (RTW) bij ziekte verzuimende werknemers met een depressieve stoornis. De verwachting was dat werknemers in de CC groep sneller terug zouden keren naar het werk dan mensen in de CAU groep.

Methoden: 126 werknemers met een gediagnosticeerde depressieve stoornis werden geïncludeerd en gedurende twaalf maanden gevolgd. 65 werknemers werden gerandomiseerd in de CC groep en 61 in de CAU groep. Werknemers in de CC groep werden behandeld door een bedrijfsarts (OP)-care manager, volgens een CC model,

welke ook een werkaanpassings interventie bevatte. Werknemers in de CAU groep kregen de gebruikelijke zorg. Data met betrekking tot terugkeer naar werk werd verkregen uit bestanden van de arbodienst. Met een Cox regressie analyse werden de uitkomsten tussen de twee groepen met elkaar vergeleken. Met een proces evaluatie werd gekeken naar de mate waarin de behandeling daadwerkelijk was toegepast.

Resultaten: 64.6% van de werknemers in de CC groep en 59.0% van de werknemers in de CAU groep keerden binnen twaalf maanden duurzaam terug naar het werk. Werknemers behandeld volgens CC keerden niet sneller terug naar het werk en hadden ook niet minder verzuim dagen tijdens de twaalf maanden dat ze werden gevolgd dan werknemers uit de CAU groep. Een proces evaluatie liet zien dat maar 66.7% (N = 40) van de werknemers in de CC groep ook daadwerkelijk een behandeling volgens het CC model hebben gehad. Van hen heeft maar 21.7% (N = 5) ook de werkaanpassings-interventie ontvangen.

Conclusie: Het gebrek aan verschil tussen CC en CAU zou kunnen worden verklaard door de mate waarin de CC behandeling daadwerkelijk is toegepast. Deze matige implementatie wordt mogelijk verklaard door een gebrek aan vertrouwen van patiënten in de onafhankelijkheid van bedrijfsartsen, veroorzaakt door de scheiding van behandeling en verzuim begeleiding in Nederland. Toekomstig onderzoek zou dit nader moeten verhelderen.

Foreword

This thesis was written for my Master's degree in Clinical and Health Psychology. I am grateful for having had the possibility to perform my master's thesis during an internship at the Institute of Mental Health and Addiction (TRIMBOS) in Utrecht. This project perfectly suited my personal interests and motives. From day one it was easy to dedicate my time and devotion to my thesis. I learned a great deal during the 560 hours I spent at the institute. It gave me great insights into the profession of a scientific researcher.

I would like to thank my colleagues at the TRIMBOS department of Diagnosis and Treatment for their kindness, interest and involvement during my internship. A special word of praise goes to my supervisor drs. Moniek Vlasveld from the Institute of Mental Health and Addiction. Her feedback, suggestions and guidance during the process of writing my thesis is greatly appreciated. Finally, I would like to express my appreciation to my supervisor dr. Sibe Doosje from Utrecht University for his input, support, assessment and willingness to visit the institute for meetings, as well as the final presentation of my thesis.

Introduction

Major Depressive Disorder (MDD) is a common mental disorder with a widespread range of individual and societal consequences. In the Netherlands MDD has a lifetime prevalence of 15.4% and a 12-month prevalence of 5.7% (Bijl, Ravelli, & Van Zessen, 1998). MDD often causes long-term absenteeism (Kruijshaar, Hoeymans, Bijl, Spijker, & Essink-Bot, 2003; Plaisier et al., 2010). In addition to financial implications this also has social consequences for the patients themselves. Prolonged absence from work regularly results in a lack of social structure and a lack of meaningful activity, often resulting in a decreased quality of life (Bilsker, Wiseman, & Gilbert, 2006; Bowling, 1995). Moreover, prolonged sick leave is associated with a reduced probability of eventual return to work and subsequent economic and social deprivation (Bilsker et al., 2006; Henderson, Glozier, & Holland, 2005). Besides absenteeism, MDD is often related to presenteeism (attending work while sick) (Plaisier et al., 2010; Koopman et al., 2002). MDD is associated with the highest productivity-loss related costs of all chronic illnesses (Druss, Rosenheck, & Sledge, 2000; Buist-Bouwman, De Graaf, Vollebergh, & Ormel, 2005).

Many interventions for MDD have proven to be effective in reducing symptoms (Ormel, Bartel, & Nolen, 2003). However, a reduction in depressive symptoms does not automatically lead to a recovery of functioning at work (Schene, Koeter, Kikkert, Swinkels, & McCrone, 2007; Van der Klink, Blonk, Schene, & Van Dijk, 2003; Adler et al., 2006). Treatment of patients on sick-leave due to depression should therefore not only be aimed at symptom reduction, but also at a rapid and sustainable return to work (RTW). This focus is lacking in current treatment (Nieuwenhuijsen, Verhoeven, Bültmann, Neumeyer-Gromen, & Van der Feltz-Cornelis, 2007).

A promising model for treatment of MDD is the Collaborative Care (CC) model. CC is characterized by the organization of evidence-based intervention methods in a collaborative framework. Key components of CC are: treatment tailored to one's personal needs through structured and systematic delivery of evidence based treatment, easy communication between different health-care professionals, systematic monitoring of treatment adherence and outcomes, and the introduction of a care manager, the key figure in the systematic coordination of interventions (Bower, Gilbody, Richards, Fletcher, & Sutton, 2006; Katon & Seelig, 2008; Simon, 2009; Richards et al., 2008). This model has proven to be effective in primary care settings in both the US (Katon et al., 1999; Unutzer et al., 2002; Katon et al., 1995; Katon et al., 1996) and UK (Richards et al., 2008; Chew-Graham et al., 2007). Meta analysis shows that, on average, depression outcomes improved as early as 6 months after beginning treatment and evidence of long-term benefit was found for up to 5 years (Gilbody, Bower, Fletcher, Richards, & Sutton, 2006). Since most studies focusing on CC have been conducted in

the US, an important question is whether or not the positive outcomes of CC can be replicated in the Netherlands.

Since the beginning of the 20th century sickness certification and treatment have been separated in The Netherlands. The intended benefits of this separation were the preservation of trust between doctor and patient and the protection of a patient's privacy. However, as a consequence of that separation, and the certifying role of occupational physicians (OPs), treatment has often lacked a focus on the connection between sickness and an individual's functioning at work. The importance of work for the well-being of patients in general was often neglected in the curative sector. Since 2006 only the nature, content and extent of care are embedded in a new law for insurance of healthcare. By whom and where treatment is to be conducted is no longer statutory and is now decided by the patient (Willems & Doppegieter, 2007). As a result, OPs now have the opportunity to implement their specific knowledge in the treatment of work related sicknesses.

In this study, CC was implemented in the occupational health care setting. OPs have specific knowledge about the possible connection between and individual's work environment and related illnesses. As a result they are expected to be beneficial in the promotion of rapid RTW. Therefore, the care manager role in this study was fulfilled by OPs who were specifically trained for this purpose. A workplace adjustment intervention was added to the CC model to promote faster and sustainable RTW. In prior studies similar work adjustment interventions have proven to be effective in reducing the duration of absenteeism (Anema et al., 2007; Oostrom et al., 2007; Oostrom et al., 2010). To our knowledge, this is the first study in which the CC model has been applied in this setting with a focus on promoting RTW.

The purpose of this study was to evaluate the effectiveness of the CC model in the Dutch occupational health care setting. It will be compared to Care As Usual (CAU) in terms of the time until sustainable RTW in sick-listed employees with a diagnosis of MDD. Based on prior results it is expected that employees treated according to the CC model will return to work faster than employees treated according to CAU. Furthermore, the total number of sick leave days during the follow-up is expected to be less for participants in the CC group than for employees in the CAU group. Finally, a process evaluation will be conducted to determine the efficiency of the treatment's implementation.

Methods

Design & Procedure

This study was a randomized controlled trial (RCT) in which a CC intervention for MDD was compared to CAU in the occupational health care setting. Randomization was at participant level. The intervention could not be blinded, as participants were aware of the allocation to either the CC or the CAU group. The data considering the time until sustainable RTW were derived from the occupational health care system (OHS) register in order to remove the possibility of non-response. All other data were obtained from self-report questionnaires, in order to exclude the possibility of interviewer bias. Participants in both groups were allowed to accept any other form of care outside of this study.

Participants

The sample included employees with a diagnosis of MDD who were on sick leave for between four and twelve weeks. Research on low back pain suggests that treatment at a sub-acute phase (4-12 weeks) is more effective in preventing chronic disability than attempts to treat it when it has become chronic (Waddell & Burton, 2001). In the present study a comparable 'window of opportunity' was assumed for MDD and therefore the abovementioned duration of sick leave was chosen as an outcome variable. The restriction to a minimum of four weeks of sick leave was chosen to avoid including too many employees with spontaneous recovery.

Employees that were on sick leave for between four and twelve weeks received written information from the OHS to announce the study. Next, they were sent a description of the study, written by the researchers, along with an informed consent and screening form. The screening form consisted of 9 items from the depression scale of the Patient Health Questionnaire (PHQ-9), a brief and valid instrument that measures each of the DSM-IV criteria for MDD (Lowe, Unutzer, Callahan, Perkins, & Kroenke, 2004; Kroenke, Spitzer, & Williams, 2001). The MINI-International Neuropsychiatric Interview (MINI) was administered by telephone to determine DSM-IV classification. If the MINI confirmed MDD, employees were screened for exclusion criteria. These included suicidality, psychosis, a primary diagnosis of substance abuse or dependence (as assessed by the MINI interview), an insufficient command of the Dutch language to complete the questionnaires, pregnancy and legal involvement in a dispute with the employer (e.g., work conflict). Employees who did not meet any of the exclusion criteria were randomly assigned to either the CAU or to the CC intervention.

Flowchart

Participants were recruited from November 2007 to September 2009. Figure 1 presents the flow of participants. During that period 14595 sick-listed employees were screened for depressive symptoms, of which 368 employees refused to participate. In total, 2955 employees returned the screener, 1551 (52.5%) of which screened positive for MDD. 1425 of these employees were excluded according to the exclusion criteria outlined above. The final sample included 126 employees, 61 of whom were randomly assigned to CAU and 65 to CC. Baseline characteristics of this sample can be found in table 1.

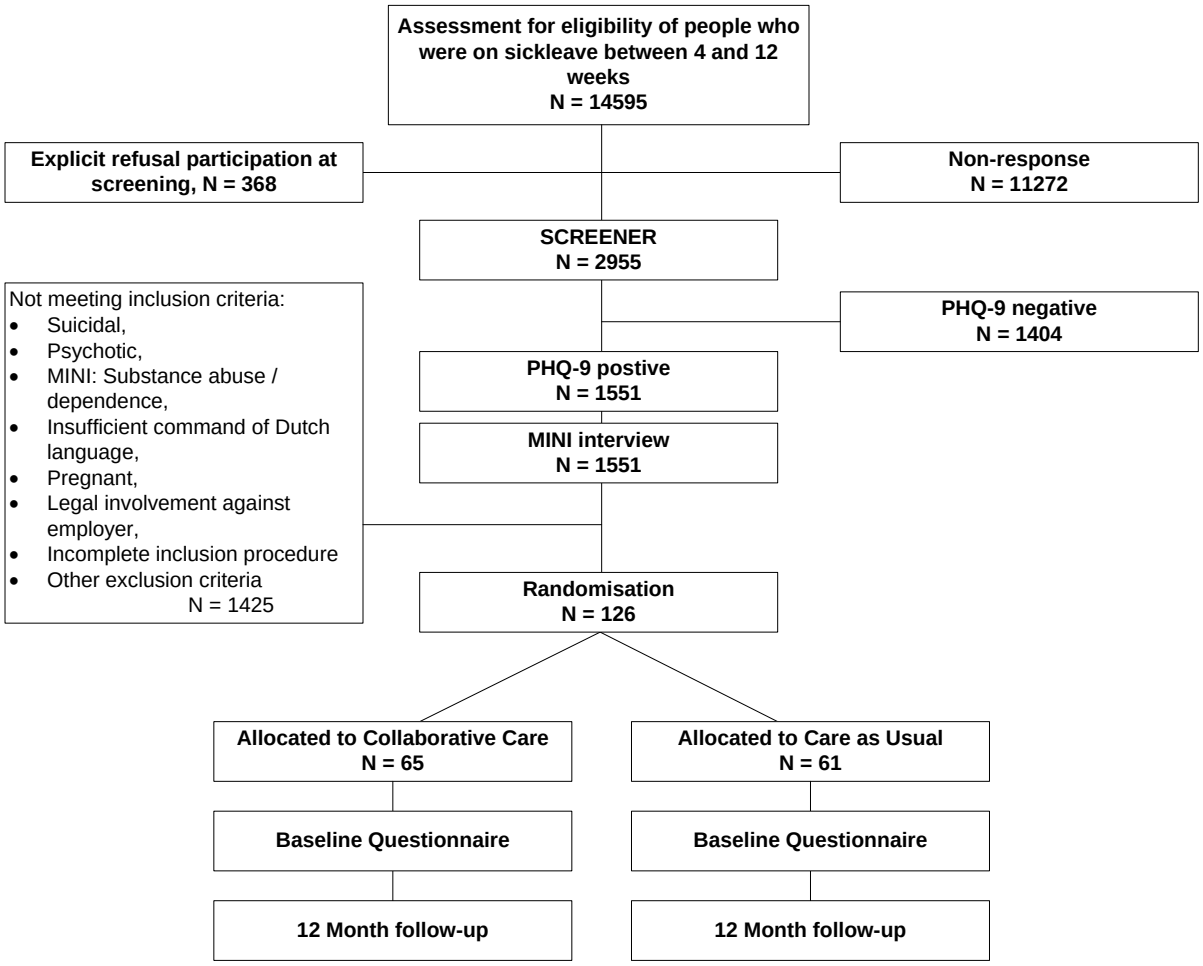

Figure 1. Flowchart of participants, according to CONSORT statement (Schulz, Altman, Moher, & Moher, 2010). PHQ-9: Depression Scale of the Patient Health Questionnaire, MINI: MINI-International Neuropsychiatric Interview.

Interventions

The CC intervention team in the occupational health care setting

In the CC intervention, OPs fulfilled the role of care manager and were trained in advance. The intervention team was formed by the consultant psychiatrist and OP-care manager. Participants allocated to the intervention group were referred to the OP-care manager in order to receive multidisciplinary treatment based on the CC framework.

In accordance with the present separation in the Dutch legislation, the treatment of MDD and the certification of sickness absence were separated in this study. The study was approved by the Institutional Review Board (in Dutch: METC) of the VU University Medical Center Amsterdam. As usual, patients' own OP provided sickness certification and was not involved in the intervention team. Communication between the OP-care manager and the own OP was only permitted after written consent by the participant; the same applied to communication between the OP-care manager and the participants' general practitioners (GPs). Communication within the CC team was allowed without limitations.

CC interventions consisted of the following elements:

- Psycho-education
- Monitoring the treatment progress using the PHQ-9 in a tracking system
- Manual guided self-help aimed at RTW and a healthy lifestyle
- Problem Solving Treatment (PST)
- Workplace intervention
- Relapse prevention
- Psychiatric consultation
- Optional: anti-depressant medication

The first six appointments with the OP-care manager were on a weekly basis; after that the participant and the OP-care manager met every other week. After psycho-education and the drafting of a treatment plan, treatment started with PST and guided self-help. Participants immediately had the option to begin antidepressants as well. Every six weeks the treatment was evaluated using the PHQ-9. Besides the screening of depressive symptoms, the PHQ-9 is a valid instrument for monitoring symptoms (Lowe et al., 2004). The OP-care manager and participant regularly monitored the progress of the treatment to determine whether an adjustment was needed. If needed the treatment could be intensified by either adding an extra 6 sessions of PST, adding antidepressant medication to the treatment plan or by increasing or changing the antidepressant medication. The OP-care manager could consult the consultant psychiatrist in the event of treatment stagnation, increased suicide risk or with other questions. If after six weeks

the PHQ-9 had not dropped by at least 5 points, which is required for a significant treatment response (Lowe et al., 2004; Kroenke et al., 2001), or if after twelve weeks no remission had occurred, treatment was intensified. The consultant-psychiatrist was asked to consider what steps to take next.

The work adjustment intervention

The CC treatment in this study contained a component specially focused on RTW, the work adjustment intervention. To achieve a greater chance of acceptance of the workplace adjustment intervention, participants and employers collaboratively looked for hindering circumstances and generated effective adjustments in work conditions (STECR Platform Reïntegratie, 2006). A work adjustment intervention has shown to be effective among employees with low back pain in reducing the duration of absenteeism. The intervention was adjusted for absent employees with stress-related problems by an Intervention Mapping strategy. This intervention did not have an overall effect on sustainable RTW but it significantly reduced the time until sustainable RTW for employees who at baseline intended to work, despite their symptoms (Anema et al., 2007; Oostrom et al., 2007; van Oostrom et al., 2010).

The content of CC, including the work adjustment intervention, is described more thoroughly elsewhere (Vlasveld et al., 2008).

Care as usual (CAU)

Participants allocated to the usual care group only received sickness certification by their regular OP. Usual care was provided according to the OP guidelines of the Dutch Board for Occupational Medicine (Van der Klink et al., 2007). As considerable variation was expected in usual care that was provided for participants with MDD, actual care that was provided in the CAU group (e.g. medication and number of contacts with physicians) was assessed by questionnaire.

Outcome measures

The primary outcome measure was sustainable RTW, defined as the duration of sick leave due to MDD in calendar days from the day of randomization until full RTW, for at least 4 weeks without recurrence. Recurrences of sick leave within 4 weeks of full RTW are considered as belonging to the initial period of sick leave, in accordance with the requirements of the Dutch Sickness Benefits legislation (Ministerie van justitie, 2001). In addition, the total number of days of sick leave in 12 months was calculated to take into account recurrence of sickness absence (Anema et al., 2007; Oostrom van et al., 2008). Data were derived from OHS databases. Trimbos/iMTA questionnaire for Costs

associated with Psychiatric Illness (TiC-P) were used to check for accuracy of these data (Hakkaart-van Roijen, Van Straten, Al, Rutten, & Donker, 2006).

Data analysis

All analyses were done using SPSS (version 15). The data were analyzed on an intention-to-treat basis (i.e., the patients remained in the group to which they were randomly allocated at baseline).

A Kaplan Meier analysis was used to describe the association between the sick leave time until full RTW and the group allocation, status was censored for when participants did not return to work within the follow-up year and for participants who left their current jobs. An unadjusted Cox regression analysis was performed to assess, confounding and effect modification. The potential confounders or effect modifiers were predefined and measured at baseline. These included: personal characteristics (gender and age); job characteristics (decision latitude and physical job demands); and symptoms and conditions (duration of sick leave before baseline, severity of physical symptoms, chronic diseases and severity of depressive symptoms). First, univariate tests for confounding and effect modification were performed. Covariates were considered as confounders if the ß of the intervention changed more than 10% by adding the covariate to the Cox regression model. Effect modification was considered to be present when the ß coefficient of the interaction term had a $p<.05$. A test of the proportional hazard assumption was conducted. A Mann-Whitney U test was used to determine differences in total number of sick leave days during the 12-month follow-up.

A process evaluation was conducted to determine if participants received the CC treatment according to the guidelines. Information was collected from the tracking system, from questionnaires filled out by participants and the OP-care managers. Another Cox regression analysis was performed to determine the effect of the CC treatment compared to CAU for employees that did truly receive the CC treatment.

Results

Sample characteristics

Table 1 shows the baseline characteristics of the participants in the CC and CAU groups. Only for physical job demands there was a significant between group difference.

Table 1. Baseline characteristics of the participants

	CC N = 65	**CAU N = 61**	**Total N = 126**	*P*
Demographics				
Gender (% male)	43.1	49.2	46.0	.996
Age in years	41.8 (11.4)	43.3 (11.5)	42.6 (11.4)	.452
Dutch nationality (%)	95.4	91.8	93.7	.418
Born in the Netherlands (%)	95.4	85.2	90.5	.058
Married / cohabiting (%)	60.0	73.3	66.4	.117
Educational level (low)	27.8	35.0	31.4	.317
Educational level (med)	36.1	30.0	33.1	.604
Educational level (high)	36.1	35.0	35.5	.946
Symptoms and conditions				
Depressive Symptoms (PHQ9) (range 0 - 27)	15.9 (4.8)	16.0 (5.4)	16.0 (5.1)	.888
Duration of sick leave at baseline	70.7 (20.6)	69.9 (20.2)	70.3 (20.3)	.825
Somatic symptoms (range 0 - 27)	13.6 (5.1)	12.3 (5.1)	13.0 (5.13)	.139
Chronic diseases	1.2 (1.1)	1.2 (1.3)	1.2 (1.2)	.942
Generalized Anxiety (%)	51.6	50.8	51.2	.934
Panic Disorder (%)	15.9	16.9	16.4	.874
Psychological/Psychiatric co-intervention (%)	86.0	93.9	89.9	.196
Job characteristics				
Decision lattitude (range 26 - 92)	67.6 (12.6)	64.2 (12.4)	66.0 (12.5)	.136
Physical job demands (range 5 - 20)	9.4 (3.5)	11.3 (3.8)	10.3 (3.7)	.006*

*Note: Numbers are means and standard deviations, unless otherwise specified; CC = Collaborative care; CAU = Care As Usual. ; *p <.05*

Time until sustainable return to work

Nine employees in the CC group and eight employees in the CAU group left their current job during the follow-up. After the 12-month follow-up, 42 employees (64.6%) that were allocated to the CC group sustainably returned to work with a median time until sustainable RTW of 146 days. In the CAU group, 36 employees (59.0%) returned to work, with a median time until sustainable RTW in this group being 175 days. A Cox regression analysis showed no significant difference between the CC group and the CAU group on time until sustainable RTW. The unadjusted Hazard Ratio (HR) was 1.176 (95% CI 0.753 to 1.837).

In the univariate analyses, no variables appeared to be significant effect modifiers. In the final multivariate model, physical symptoms, age, depressive symptoms, gender and chronic diseases remained as confounders (Table 2).

The median total number of sick-leave days during the 12-month follow-up was 185 for the CC group. For the CAU group the median total number of sick-leave days was 176. The median total number of sick-leave days did not differ significantly between the CC (mean rank score 65) and the CAU (mean rank score 62) groups (U = 1883; p = .625).

Table 2. Cox proportional hazard model

					95% CI	
	B	SE	*p*	HR	Lower	Upper
Crude model	0.162	0.227	0.475	1.176	0.753	1.837
Adjusted model*	0.116	0.236	0.625	1.122	0.707	1.783

* Adjusted for physical symptoms, age, depressive symptoms, gender and chronic diseases

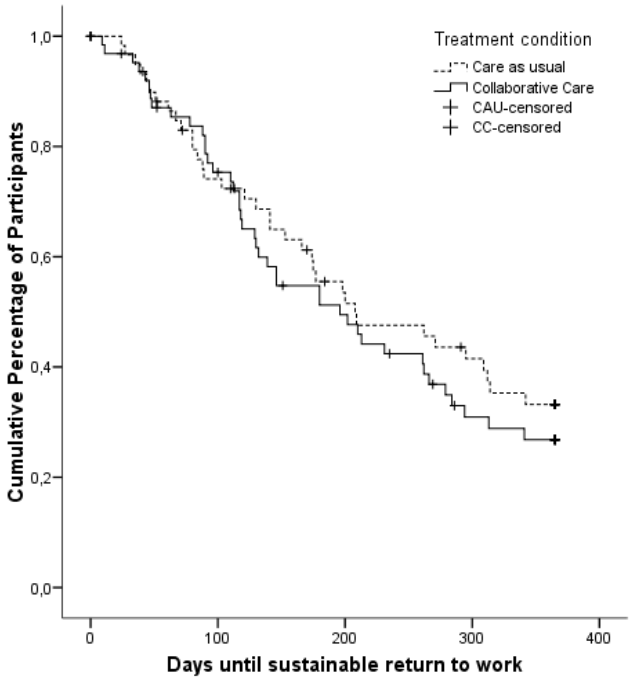

Figure 2. Kaplan Meijer Survival function. Number of days of sick leave until sustainable return to work.

Process evaluation

As can be seen in Figure 2, 66.7% (N = 40) of the participants allocated to the CC treatment actually received the CC treatment from an OP-care manager. Only 21.7% (N = 5) of the participants receiving the CC treatment received the workplace adjustment intervention as well. The main reason for not carrying out the CC intervention was objection by the employee (68.4%). For 5.3% of participants allocated to the CC intervention, remission occurred prior to starting treatment. Reasons for not carrying out the workplace adjustment intervention included: objection by the employee (31.8%) objection by the employer (13.7%) and the fact that RTW had occurred (or was expected to occur) without applying this intervention (22.7%).

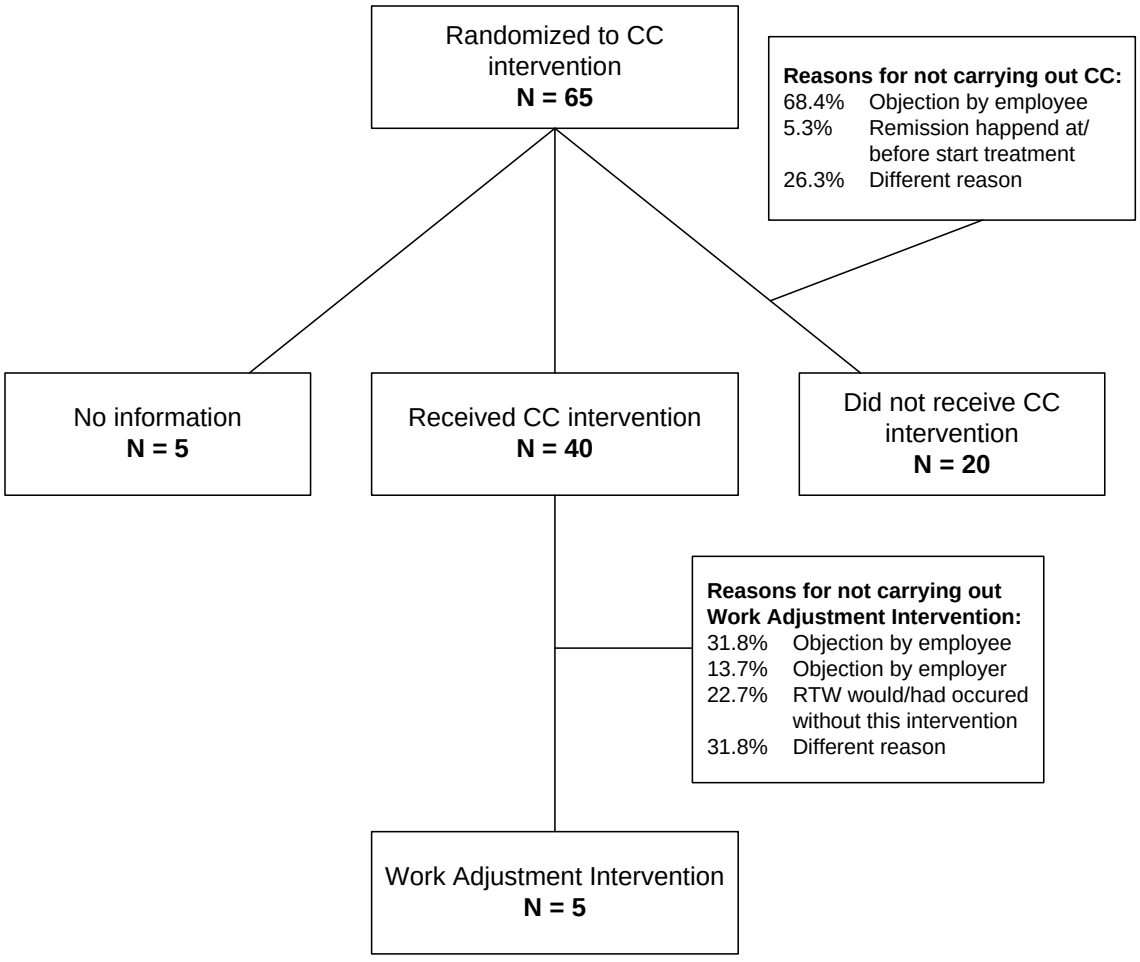

Figure 3. Process Evaluation Flowchart, data derived from tracking system.

Per protocol analysis

70% of the employees who, according to the process evaluation, received the CC intervention, returned to work during the 12 month follow-up. There was no significant difference between the CC and CAU interventions (59%; p=.26). Median time until sustainable RTW was 165.5 days for participants who received the CC intervention. The Cox regression analysis still showed no significant difference between the CC condition and the CAU condition on time until RTW. The unadjusted HR was 1.227 (95% CI 0.748 to 2.013). 5 Employees (12.5%) left their current jobs during the 12 month follow-up. This did not differ significantly (p=.93) from CAU either.

The median number of sick-leave days during the 12-month follow-up was 196 for the CC group (mean rank score = 51) and 176 for the CAU group (mean rank score = 51). Thus, there was no significant difference between intervention groups (U = 1218; p = .992).

Table 3. Per protocol Cox proportional hazard model

					95% CI	
	B	SE	*p*	HR	Lower	Upper
Crude model	0.205	0.253	0.418	1.227	0.748	2.013
Adjusted model*	0.137	0.262	0.6	1.147	0.687	1.915

* Adjusted for physical symptoms, age, depressive symptoms, gender and chronic diseases

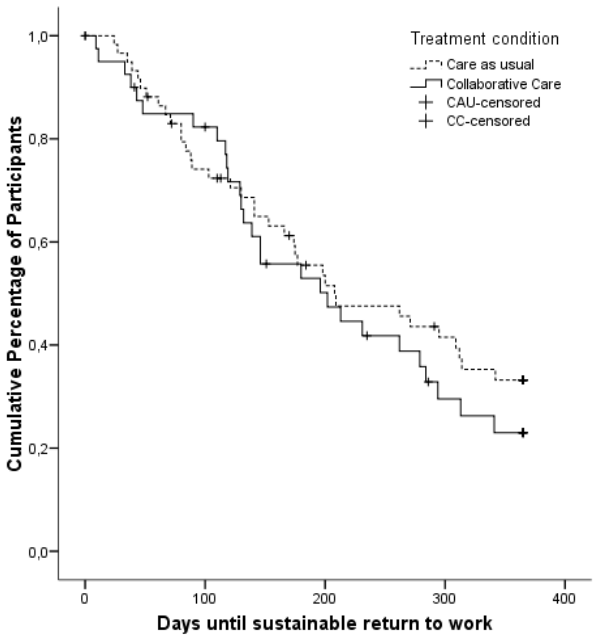

Figure 4. Per protocol Kaplan Meijer Survival function. Numbers of days of sickness absence until sustainable return to work after process analysis.

Discussion

Main findings

The primary objective of this study was to evaluate the effectiveness of CC compared to CAU in terms of time until sustainable RTW in sick-listed employees with MDD in the Netherlands. Initial analysis of the data showed no significant difference in the time until sustainable RTW between the treatment groups. The expected superior effect on sustainable return to work of CC compared to CAU was not found. The process evaluation showed that a major number of participants who were randomized to the CC condition did not actually receive the treatment from an OP-care manager. Of the participants that did receive treatment according to CC only a few also received the workplace adjustment intervention. These results suggest that implementation of the CC intervention was insufficient. A per protocol analysis of the data showed no significant difference between participants that had actually received the CC treatment and participants in the CAU group either. Per protocol analysis for the workplace adjustment intervention was impossible because of the small sample size.

OP-care managers were asked why CC and the workplace adjustment intervention were not conducted. In both situations, objections by the employee were most often the reason for not conducting the intervention. Another reason commonly cited by the OP-care managers was that RTW would have occurred regardless of applying the intervention.

Comparison with other studies

CC has proven to be effective in reducing depressive symptoms in the USA as well as in the UK (Katon et al., 1999; Unutzer et al., 2002; Katon et al., 1995; Katon et al., 1996). As far as we know, no other studies have been performed where CC was evaluated in terms of RTW and where CC was implemented in an occupational health care setting. In other studies, OPs have been successful in promoting RTW using a similar version of the workplace adjustment intervention as we did in this study (Anema et al., 2004; Anema et al., 2007; Oostrom et al., 2007), but the disorders in most of these studies were physical in nature. In one study, a similar workplace adjustment intervention was proven to be effective in promoting RTW in employees with mental distress when at baseline employees were motivated to return to work despite symptoms. It was suggested that among employees and employers it is more acceptable to work while still having symptoms of low back pain than with mental health problems (Van Oostrom et al., 2010). In this study we did not measure this motivation but it may have influenced our results as well.

An explanation for the disappointing implementation may be found in the OPs' role of care manager. We suggest that the separation of treatment and sickness

certification in the Netherlands, and OPs' historical position in this system, may have played a role in the insufficient implementation of the intervention. The position of OPs is controversial as they work with patients, employers and management of OHS who all have different interests (Rebergen et al., 2006). Other studies confirmed that employees as well as other healthcare professionals lack a clear perception about the role and abilities of OPs in the general health care system (Anema et al., 2006; Andrea et al., 2004). In this study the OP-care manager in the CC condition was a different person than one's own OP. This was done in an attempt to alleviate concerns about the dual responsibility of the OP to both the employer and employee. We nevertheless suggest that OPs independency, agency and expertise may have been questioned by employees, resulting in lower levels of confidence in their abilities as main care providers. Furthermore, patient-OP distrust is recognized in various countries (Buijs, Anema, Evers, van Dijk, & Van der Klink, 2006; Plomp & Ballast, 2010). Finally, employees seem to prefer to visit a GP when work related health problems consider emotional work demands and work-family conflicts. Consulting an OP is preferred for problems related to physical work demands (Andrea et al., 2004). The latter could possibly explain the difference in outcome in other studies in which workplace adjustment interventions provided by OPs have proven to be effective in treating physical problems. Either way it is possible that the OPs' role of care manager and the nature of symptoms may have had a major impact on the outcome of the present study.

Strengths and limitations

To our knowledge, this is the first study to evaluate CC in the occupational health care setting in patients with MDD. For this reason, it is an important contribution to this research area, specifically, the possible implementation of CC in other health care settings. The present study implemented a RCT design, with randomization at patient level, thereby minimizing contamination between the two treatment groups. We were able to follow participants for a relatively long period of 12 months. Because the data on RTW were derived from the OHS systems, it was available to all employees, was unbiased and there was no loss at follow-up.

Despite these strengths, this study also has some limitations. Regardless of the reasons for not performing the CC intervention, the implementation of the intervention was inadequate. Because of the limited amount of participants that actually received the workplace intervention, power was too low to allow a proper per-protocol analysis and determine the effects of the individual modules of the intervention.

Future research and clinical implementation

Patients' distrust in an OPs' care managing abilities may have had major impact on the implementation of the CC intervention in this study. It is therefore suggested that qualitative research be carried out, to acquire understanding of the limits, obstacles and strengths of implementation of CC in the occupational health care setting. In order to provide better care in work related healthcare issues it seems sensible to promote the abilities, qualities and added value of OPs in primary health care. Another option to determine the value of CC in the occupational health care setting would be to have the care managing role be fulfilled by another health care professional. An OP could then be consulted for advice on work related adjustment. Because of the separation of treatment and sick leave certification in the Netherlands, the results in this study should be generalized with caution. More extensive research on implementing CC in other countries and implementing CC to promote RTW is desirable.

Abbreviations

MDD	Major Depressive Disorder
CC	Collaborative Care
CAU	Care as usual
RTW	Return to work
OP	Occupational Physician
OHS	Occupational health care service
GP	General Practitioner
RCT	Randomized controlled trial
PST	Problem Solving Treatment
MINI	MINI-International Neuropsychiatric Interview

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