Collaborative care for depression in primary care, and the influence of concomitant physical symptoms. A thesis from the Netherlands Depression Initiative
Huijbregts, K.M.L.

2013

document version
Publisher's PDF, also known as Version of record

Link to publication in VU Research Portal

citation for published version (APA)

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

• Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
• You may not further distribute the material or use it for any profit-making activity or commercial gain
• You may freely distribute the URL identifying the publication in the public portal

Take down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

E-mail address:
vuresearchportal.ub@vu.nl

Download date: 21. Apr. 2022
Cost-utility of Collaborative care for Major Depressive Disorder in primary care in the Netherlands

Goorden, M.; Huijbregts, K.M.L.; de Jong, F.; van Marwijk, H.W.J.; Aartjan T.F. Beekman; Herman J. Adèr; Leona Hakkaart-van Roijen; Christina M. van der Feltz-Cornelis
Abstract

Background: Major depression is a great burden for society, as it is common and associated with high disability and high costs. Research showed that collaborative care may be a cost-effective treatment. The aim of this study was to evaluate the cost-utility of collaborative care for major depressive disorder compared to care as usual in a primary healthcare setting. A societal perspective was taken.

Methods: In this cluster-randomized controlled trial, 150 patients were included; 48 patients were randomized in the screened care as usual condition, 1 patient in the usual care condition as identified by the GP, 45 in the screened collaborative care group and 56 in the collaborative care group as identified by the GP. Baseline measurements and follow up measures (3, 6, 9 and 12 months) were assessed by questionnaire. We applied the TiC-P, the SF-HQL and the EQ-5D respectively measuring the health care utilization, production losses and general health related quality of life.

Results: The average annual direct medical costs in the screened collaborative care group were €1,540 (95% C.I., 1,459 to 1,623) compared to €2,231 (95% C.I., 1,915 to 2,590) in the screened care as usual group. The average quality of life years (QALY’s) gained were 0.01 Qaly higher in the collaborative care group, indicating that collaborative care is less costly and also more effective than care as usual. Including the productivity costs did improve the result as collaborative care became dominant. The assessment comparing the total groups, screened and identified by the GP, showed that the collaborative care group was dominant to the care as usual group regardless what perspective was taken.

Conclusion: The cost-utility analysis showed that collaborative care was dominant to care as usual in the GP-setting. Efforts towards implementation and research into factors associated with successful implementation can be encouraged based on these results.

Trial registration: Netherlands Trial Register ISRCTN15266438
Introduction:

Major Depressive Disorder (MDD) was ranked fourth in the list of diseases that cause the most Disability Adjusted Life Years (DALYs) in 2002, and it is expected to be ranked second in 2030 worldwide and first in High-income countries. The costs associated with MDD, especially the costs for society, are high. In case of a depressive disorder, the productivity costs amount to € 242 million per million workers and on average account for 60-70 % of the total costs associated with depression.

Research into interventions that reduce the societal burden of MDD is therefore of paramount importance. A promising treatment for MDD is the collaborative care model. This integrated fixed-fee service provision increases collaboration between healthcare professionals and patients and actively monitors patients’ prognosis as part of a new value network. A recent study in the Netherlands showed that collaborative care for patients with MDD is effective. Information on the cost-effectiveness of collaborative care is still limited. However, the role of economic evaluations in health care decision-making is growing. A review showed that collaborative care was associated with high clinical benefits at a low increment in health care costs for older adults. The utilities gained in these studies were between 0,03 and 0.12 Qaly’s. However, quality of the studies in the review, as measured by the Consensus on Health Economic Criteria (CHEC) list was low and the studies had a maximum follow-up period of only 6 months. Another drawback of existing work is that production losses, which are responsible for more than 60% of the societal costs associated with depression, were only measured in one study. Moreover all previous cost-utility studies pertaining to collaborative care for depression were conducted in the United States. This might affect the generalizability of the studies to other countries or healthcare systems. In the Netherlands, for instance, GP-practices are most often small business units (1-5 GPs per practice, mean 2) with their own culture and rules.

Usual care in the Netherlands consists of monitoring of symptoms at least every two weeks, encouraging pleasurable activities and achievable goals, encouraging patients to inform key figures in their environment, and paying attention to possible predisposing and perpetuating factors and, if necessary, of the prescription of an antidepressant. Referral to a psychologist is discussed. In the collaborative care model a depression care manager (DCM) collaborates with a GP and a liaison psychiatrist in order to provide depression treatment in primary care. We therefore expect the costs that are associated with collaborative care to be higher compared to usual care. However, as the effect of treatment is also expected to be higher compared to care as usual, the additional costs for other health care providers may decrease over time causing the intervention to be cost-effective or even dominant.

The primary objective of this paper was to assess the cost utility of collaborative care in primary care compared to care as usual for MDD in the Netherlands. The assessment was conducted from a societal perspective, meaning that all relevant costs and effects were taken into account.
Methods

Randomization and recruitment

The cost-utility analysis was conducted along a cluster-randomized controlled trial (RCT), evaluating the effectiveness of collaborative care versus care as usual in the primary care setting. Results of this RCT on the effectiveness of collaborative care and details of this study have been described elsewhere. Computer-generated randomization took place at the level of 18 primary care centers. Each general practice randomized to the collaborative care condition assigned a practice nurse; the DCM. Patients of the respective practices could enter the trial in two ways: either by screening or after identification by their GP. Screening was done as follows: patients who had consulted the GP in the past 6 months received the Patient Health Questionnaire (the PHQ-9) and were asked for informed consent by mail. If they scored screen-positive (PHQ9 score ≥ 10), the mini-International Neuropsychiatric interview (MINI PLUS International Neuropsychiatric interview) was administered by telephone. If patients had MDD according to the MINI and were over 17 years old, they were included. Patients were excluded if they were suicidal, had a psychosis, dementia drug or alcohol dependence, or insufficient knowledge of Dutch or if they were already under specialty mental health treatment. Eventually, 150 patients were included; 49 patients were randomized in the care as usual condition and 101 patients were randomized in the collaborative care condition (45 in the screened group and 56 identified by the GP).

Study oversight

The study protocol was approved by the Medical Ethics Committee (METC) of the VU University Medical Center (protocol number 2006/158) and is described in greater detail elsewhere. This RCT was part of the Depression Initiative, a national initiative to improve depression management in the Netherlands.

Collaborative care

The integrated intervention consisted of problem solving treatment (PST), manual guided self-help, and if necessary antidepressants. The DCM provided manual guided self-help (ZHM) and PST, and the GP prescribed antidepressant medication. Remission (PHQ9<5) after 12 weeks of treatment was the target. If this was not the case a switch to more intensive treatment, like antidepressant medication (or switching to other medication or increasing the doses of the antidepressant) or psychotherapy, was advised. The DCM discussed the progress of the patients with the GP and only kept patients on the same treatment when they decreased at least 5 points on the PHQ9 after six weeks of treatment. At the occurrence of adverse events (or lack of progress), a psychiatrist could be consulted. The care manager, the GP and the consultant psychiatrist all had access to web-based tracking system to monitor and follow the protocol. In case of suicidal tendencies, a protocol was followed. GPs in Primary care centers randomized to the collaborative care condition received training in the collaborative care model, the use of the web-based tracking system and got acquainted with the consultant psychiatrist. If remission was not achieved between 18 to 24 weeks, referral to specialty mental health care was seriously considered.
Usual care
At the beginning of the study, the DCM discussed the depressive disorder with the participants and the option to seek treatment from their GP. The GPs in the care as usual group were blind for the presence of MDD in the screened patients. As the care that is actually delivered may vary accordingly, this was assessed by a questionnaire at the GP’s office.

Data collection and outcome measures
Data was collected at 3 months interval by the Netherlands Institute of Mental Health and Addiction (NIMHA or Trimbos-instituut). The follow-up was 1 year and measurements took place at baseline (T0) and after 3 (T1), 6 (T2), 9 (T3) and 12 (T4) months. All confidential information was treated according to the medical confidentiality rules and patients’ names were coded. Cost-utility was determined by calculating, the medical costs, the productivity costs and the quality of life. The Trimbos/iMTA questionnaire for Costs associated with Psychiatric Illness (TiC-P)\cite{84} and the EuroQol (EQ-5D)\cite{143} were respectively used. Finally, cost utility was expressed in cost per QALY.

Quality of life
We applied the EuroQol (EQ-5D) to estimate utilities. This generic health index is a standardized, validated instrument and encompasses five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each dimension consists of three levels: no problems, some problems and extreme problems, therefore defining a total of 243 different health states. To obtain a utility score per patient, the area-under-the curve method (AUC) was applied.\cite{144}

Health care utilization costs
Part 1 of the TiC-P is a validated instrument that measures the direct medical costs by measuring the number of contacts with health care services during the last three months, so we can extract the costs by multiplying them by the reference unit prices of 2009 of these services.\cite{145}

Productivity costs
The second part of the TiC-P contains the SF-HLQ. This part questions about productivity losses that are caused by absence, reduced efficiency at work and difficulties in job performance. Sickness absence for less than 1 month was defined as short-term absence and sickness absence for more than 1 month as long-term absence. If respondents indicated that they had been absent for the entire recall period, data were collected from the time when the period of long-term absence started. This additional information was used to value the production losses according to the friction cost method.\cite{104} This method takes into account the economic circumstances that limit the losses of productivity to society, which are related to the fact that a formerly unemployed person may replace a person who becomes disabled. Productivity losses were valued according to the average value added per worker by age and gender per day and per hour.
**Incremental Cost-Effectiveness Ratio**

An incremental cost-effectiveness ratio was calculated to obtain the costs per Quality Adjusted Life Year (QALY). The incremental cost-effectiveness ratio was calculated by dividing the incremental costs by the incremental effects.

**Statistical analysis**

Analyses were conducted using Statistical Package for the Social Sciences 19.0 (SPSS 19.0), Statistics and data (Stata 8.0 se) and Excel. First, the direct costs and quality of life scores were calculated by SPSS. No selective dropout was observed. Missing values in direct costs and quality of life scores per time unit were modelled and imputed with chained equations (PMM) in Stata. 10 imputed datasets were created. Different baseline variables, like age and gender were included to get a better estimate. The uncertainty in the analysis was assessed using bootstrapping in Excel, with 10,000 iterations. This was expressed in a cost-effectiveness plane.
Results

At baseline, 9 primary care centers were randomized to the intervention condition and 9 centers to the control condition. 150 patients were included; 48 patients were randomized in the screened care as usual, 45 patients in the screened collaborative care group and 56 in the collaborative care group as identified by the GP. As GPs cannot refer people without a subsequent intervention, in the care as usual condition only 1 patient was identified by the GP. Table 1 summarizes the baseline demographic characteristics for the screened groups.

Table 1 Characteristics of the patients in the screened collaborative care group and the screened care as usual group

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Collaborative care screened (N=45)</th>
<th>Care as usual screened (N=48)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (SD)</td>
<td>52.0 (13.0)</td>
<td>53.0 (14.2)</td>
</tr>
<tr>
<td>Gender (% female)</td>
<td>66.7</td>
<td>72.9</td>
</tr>
<tr>
<td>Living alone (%)</td>
<td>53.3</td>
<td>52.1</td>
</tr>
<tr>
<td>Non Dutch origin (%)</td>
<td>22.7</td>
<td>25.5</td>
</tr>
<tr>
<td>Level of education</td>
<td>5.4 (2.5)</td>
<td>5.2 (3.0)</td>
</tr>
<tr>
<td>EQ5D at baseline (T0)</td>
<td>0.54 (0.25)</td>
<td>0.56 (0.25)</td>
</tr>
<tr>
<td>Prior episode of depression</td>
<td>58.5</td>
<td>57.4</td>
</tr>
<tr>
<td>Paid job (%)</td>
<td>46.7</td>
<td>48.9</td>
</tr>
</tbody>
</table>

*=p<0,05

Quality of life

Quality of life, screened group

Quality of life scores were imputed. Both groups improved significantly over time; 0.05 (95 % C.I., 0.03 to 0.06) for the care as usual group and 0.06 (95 % C.I., 0.05 to 0.08) for the collaborative care group, but there was no significant difference in improvement over time between both groups 0.01 (95 % C.I., -0.02 to 0.03), see table 2.
Table 2 Mean Utility scores (SD) by treatment arm at baseline, after 3 months, after 6 months and after 1 year for the screened group

<table>
<thead>
<tr>
<th></th>
<th>Collaborative Care screened (n=45)</th>
<th>Care as usual (n=48)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>0.54 (0.25)</td>
<td>0.56 (0.25)</td>
</tr>
<tr>
<td>After 3 months</td>
<td>0.62 (0.27)</td>
<td>0.58 (0.29)</td>
</tr>
<tr>
<td>After 6 months</td>
<td>0.58 (0.29)</td>
<td>0.58 (0.25)</td>
</tr>
<tr>
<td>After 9 months</td>
<td>0.66 (0.24)</td>
<td>0.65 (0.25)</td>
</tr>
<tr>
<td>After 12 months</td>
<td>0.60 (0.27)</td>
<td>0.66 (0.25)</td>
</tr>
</tbody>
</table>

Quality of life, total group
The difference in improvement between both groups was 0.04 and was significant over time (95 % C.I., 0.01 to 0.06).

Health care costs
Health care costs, screened group
The average direct medical costs were € 1,540 (95 % C.I., 1,459 to 1,623) for the screened collaborative care group compared to €2,231 (95 % C.I., 1,915 to 2,590) for the care as usual group, see table 3. The costs that made up the largest part of the total costs are presented in a bar chart, see figure 1.
### Table 3: Average cost per year of health care providers for the screened group based on, Euro’s, 2009

<table>
<thead>
<tr>
<th></th>
<th>Collaborative Care screened (N=45)</th>
<th>Care As Usual (N=48)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean costs (SD)</td>
<td>Costs (%)</td>
</tr>
<tr>
<td>GP</td>
<td>€300 (274)</td>
<td>18.6</td>
</tr>
<tr>
<td>Psychiatric nurse</td>
<td>€148 (279)</td>
<td>9.2</td>
</tr>
<tr>
<td>Mental health care</td>
<td>€74 (194)</td>
<td>4.6</td>
</tr>
<tr>
<td>practice nurse</td>
<td>€227 (490)</td>
<td>14.1</td>
</tr>
<tr>
<td>Mental Health Care</td>
<td>€164 (382)</td>
<td>10.2</td>
</tr>
<tr>
<td>Institute</td>
<td>€141 (719)</td>
<td>8.7</td>
</tr>
<tr>
<td>Private psychologist</td>
<td>€32 (98)</td>
<td>2.0</td>
</tr>
<tr>
<td>Psychiatri st at</td>
<td>€135 (176)</td>
<td>8.4</td>
</tr>
<tr>
<td>outpatient centre of</td>
<td>€144 (255)</td>
<td>8.9</td>
</tr>
<tr>
<td>hospital</td>
<td>€153 (342)</td>
<td>9.5</td>
</tr>
<tr>
<td>Occupational Physician</td>
<td>€0 (0)</td>
<td>0.0</td>
</tr>
<tr>
<td>(OP)</td>
<td>€55 (176)</td>
<td>3.4</td>
</tr>
<tr>
<td>Specialist</td>
<td>€0 (0)</td>
<td>0.0</td>
</tr>
<tr>
<td>Paramedical</td>
<td>€5 (31)</td>
<td>0.3</td>
</tr>
<tr>
<td>Social Worker</td>
<td>€37 (61)</td>
<td>2.3</td>
</tr>
</tbody>
</table>

‡‡ The sum of the mean costs of health care providers is not equal to the average total costs. This is because multiple imputation was performed on the costs after calculating the total costs on different points in time.
Health care costs, total group

For the collaborative care group, the average direct medical costs were €2,260 (95 % C.I., 2,146 to 2,378) compared to €2,283 (95 % C.I., 1,975 to 2,628) for the care as usual group.

Productivity costs

Productivity costs, screened group

Total Average productivity costs were €1.828 (SD=4236) in the collaborative care group and €3.944 (SD=16.657) in the care as usual group. Main part of the productivity costs (68 % for the collaborative group and 86 % for the care as usual group) was due to absence from work.

Productivity costs, total group

Assessing the productivity costs for the total group showed that there was no difference in productivity costs between both groups.

Incremental cost-effectiveness ratio

Incremental cost-effectiveness ratio, screened group

In the collaborative care group, the average quality of life years (QALY's) gained were higher but the direct medical costs were lower, compared to the care as usual group, see table 4.
Table 4 Incremental costs, Incremental utility, for the screened group

<table>
<thead>
<tr>
<th>Collaborative Care screened (n=45)</th>
<th>Care As Usual (n=49)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average direct medical costs</td>
<td>€1,540 (95% C.I., 1,459 to 1,623)</td>
</tr>
<tr>
<td>Incremental utility</td>
<td>0.01 (95% C.I., -0.01 to 0.04)</td>
</tr>
</tbody>
</table>

The majority of the incremental cost-effect ratio (92%) falls in the south-east quadrant of the incremental cost-effectiveness plane, showing that collaborative care is dominant, meaning that it is less costly and more effective than the care as usual. The rest of the ratio’s falls into the south west quadrant indicating that treatment is less costly but also less effective.

Figure 2 | Cost-effectiveness plane for the screened group

When indirect costs were included 91% of the ratio’s fall into the south-east quadrant, meaning that collaborative care is dominant. 8% of the cost-effectiveness ratio falls into the south-west quadrant, indicating that it is less costly but also less effective.

**Incremental cost-effectiveness ratio**

**Incremental cost-effectiveness ratio, total group**

Now the majority of the incremental cost-effect ratio (54%) falls in the south-east quadrant of the incremental cost-effectiveness plane, indicating that collaborative care is dominant, meaning that it is more effective and also less costly. The rest of the costs fall into the north-east quadrant indicating that collaborative care is more costly but also
more effective. Including the productivity costs did not change the result, but again increased uncertainty.

**Discussion**

This study is the first cost-utility analysis in the Netherlands comparing collaborative care to care as usual for MDD in the primary healthcare setting. We showed that collaborative care is a dominant intervention, when a societal perspective is taken. The screened groups allow a straightforward comparison and the direct costs for collaborative care were on average lower and generated more utilities. The same was true when the productivity costs were included. However, this increased the uncertainty of the dominance. For the total group, the results were comparable.

In the screened collaborative care group and the total collaborative care group, the costs of (psychiatric) hospital respectively made up 58.4 % and 40.0 % of the total costs. However the percentage of people that used this number was only 4.7 % for the screened collaborative care group and 3.0 % for the collaborative care group. After further investigation, these costs were only due to visits to the hospital of rehabilitation centre and were not directly related to the collaborative care therapy. So, it was justified to define these costs as outliers. As the patients in the collaborative care group were in contact with a care manager (social worker, a psychologist, a psychiatric nurse or a mental health care practice nurse), these costs were, as expected, higher compared to the care as usual group. However, the other costs for health care services were all higher or the same in usual care when compared to collaborative care, indicating that patients that do not have a care manager, relied on other resources. The medical costs in total were higher in the total collaborative care group compared to the screened collaborative care group. More research is necessary to show if and how clinical factors did influence these costs. It is important to derive these factors as the collaborative care group identified by the GP will be more similar to patients in daily practice. As expected from other studies (2006)\textsuperscript{135,136}, the productivity costs accounted for a large amount of the total costs. It is therefore highly recommended that these costs are included, assessing cost effectiveness in a population of depressed patients generally in their working age. The productivity costs in the screened groups were lower in the collaborative care group when compared to the care as usual group. This was mostly due to the lower costs of absence in the collaborative care group. This effect vanished when the total group was considered; there was no difference in productivity costs between both groups. The group that was identified by the GP created this effect which may be caused by a selection bias. People with certain characteristics that are related to absence, may have been more prone to selection from the GP. Further research is needed to assess the relevance of patient characteristics for effective collaborative care treatment. As was described earlier (Chapter 3)\textsuperscript{138} regarding the PHQ9-score, quality of life, decreased after nine months. Longer follow up data is needed to investigate the extent to which the effectiveness of collaborative care lasts.

As collaborative care was associated with higher costs and higher utilities, when direct medical costs were considered, our study was associated with lower utilities gained (0,01 Qaly’s), when compared to studies in the review of Steenbergen et al.\textsuperscript{146} (0,03-0,12 Qaly’s). This can be explained by the difference in time span; the duration of the studies in the review was 6 months while our study measured cost-utility over a year. As the quality of life decreased after 9 months in the collaborative care group, the overall
utilities gained were lower. When the total group was considered, the study produced results that corroborate the findings of the review of Steenbergen et al.\textsuperscript{146} A possibility is that the GP selected patients that were more motivated for change, which caused the higher increase in Quality of life: further research is necessary.

The study had limitations and strengths. There was a high percentage of non-response to the questionnaires that were sent by mail, although there was no indication of selective non-response. As the intensity of collaborative care decreased after 9 months a stronger focus on maintaining response and remission may be an important issue for the future. The screened patients were all blinded before inclusion which allowed for an unbiased comparison between both groups. The GP-identified collaborative care group involved GPs selecting patients. There was an obvious selection bias for this particular group for two reasons. Firstly GP's in the CAU-group may not be motivated to select patients for the trial, as they did not feel like they had anything extra to offer to these patients. As a consequence there was only one patient included in the GP-identified care as usual group (this patient was not included in the analyses) and we were practically unable to form a GP identified care as usual group. The comparison between the collaborative care total group (with the GP identified collaborative care patients) and the care as usual group, as well as the comparison between the collaborative care total group and the screened collaborative care group, is therefore explorative. Secondly, the GPs in the Collaborative Care intervention received training, which might have contributed to their improved ability to detect patients.

**Conclusion**

This study has demonstrated the cost utility of collaborative care in a primary healthcare setting using a relatively long (one year) perspective. Although collaborative care was dominant over care as usual, the results of this study leave room for improvement. A stronger focus on relapse prevention is justified as the effect of the intervention subsided to a certain extent after 9 months. Efforts towards implementation are warranted, however, as collaborative care is already cost-effective in its current form, it supports the implementation of collaborative stepped care in daily practice and widespread implementation is therefore justified.