Cost-effectiveness of an activating intervention by social workers for patients with minor mental disorders on sick leave: a randomized controlled trial

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Background: Sickness absence often occurs in patients with emotional distress or minor mental disorders. In several European countries, these patients are over-represented among those receiving illness benefits, and interventions are needed. The aim of this study was to evaluate the cost-effectiveness of an intervention conducted by social workers, designed to reduce sick leave duration in patients absent from work owing to emotional distress or minor mental disorders. Methods: In this Randomized Controlled Trial, patients were recruited by GPs. The intervention group (N = 98) received an activating, structured treatment by social workers, the control group (N = 96) received routine GP care. Sick leave duration, clinical symptoms, and medical consumption (consumption of medical staffs’ time as well as consumption of drugs) were measured at baseline and 3, 6, and 18 months later. Results: Neither for sick leave duration nor for clinical improvement over time were significant differences found between the groups. Also the associated costs were not significantly lower in the intervention group. Conclusions: Compared with usual GP care, the activating social work intervention was not superior in reducing sick leave duration, improving clinical symptoms, and decreasing medical consumption. It was also not cost-effective compared with GP routine care in the treatment of minor mental disorders. Therefore, further implementation of the intervention is not justified. Potentially, programmes aimed at reducing sick leave duration in patients with minor mental disorders carried out closer to the workplace (e.g. by occupational physicians) are more successful than programmes in primary care.

Keywords: cost effectiveness, mental disorders, primary care, randomized controlled trial, sick leave

Mental problems, whether subclinical or reaching DSM-IV1 diagnoses, are associated with high costs, such as high medical consumption and sickness absence.2,3 In The Netherlands, about one-third of the people receiving disability benefits do so because of mental health problems, the majority of which are emotional distress or minor mental health problems.4 In other European countries also, mild mental disorders, especially, account for the majority of incapacity benefit claims.2 Although several trials have been conducted on the clinical effectiveness of therapies for psychological problems in primary care, there has been little attention for economic analyses of such treatments.5 Moreover, methodological differences, such as differences in type of treatment and study populations, make it difficult to compare results of different studies. Although some treatments for minor mental disorders have shown to be effective (especially activating treatments such as cognitive behaviour therapy),6,7 professionals conducting such treatments usually are not part of the primary care team. Referral to these specialized professionals usually is more expensive than treating the patient in primary care. Moreover, the threshold for patients to receive treatment is lower in primary care. Therefore, from an economic perspective, it would be preferable if patients with minor mental disorders could successfully be treated in primary care, for instance by trained social workers.

In a study by Van der Klink and colleagues, an activating intervention by occupational physicians was found to be effective in reducing long-term absenteeism in employees on sick leave because of minor mental disorders.8,9 In the present study, a highly similar intervention was conducted by social workers and used for primary care patients with minor mental disorders on sick leave. In a previous paper on the clinical outcomes of the present study, no differences were found between patients who received this experimental intervention and patients in a control group who received routine GP care, except that patient satisfaction with the treatment was higher in the intervention group.9 However, the intervention may still have considerable benefits, such as reducing patients’ medical consumption (i.e. medical staffs’ time and the consumption of drugs), or it may take some of the workload of GPs, as patients with psychological problems make heavy demands on GPs’ workloads.10 Therefore, the aim of the present paper was to evaluate the cost-effectiveness of the intervention conducted by social workers, which was designed to reduce sick leave duration in patients absent from work owing to emotional distress or minor mental disorders. For this, health care consumption and productivity loss, their associated costs, and cost-effectiveness were evaluated and presented in this paper.
Methods

Setting, participants, and randomization

Between August 2001 and July 2003, 370 patients were recruited by 70 GPs in the city of Almere, The Netherlands. Inclusion criteria were: (i) suffering from minor mental disorders according to GP and patient; (ii) paid employment; (iii) on sick leave because of minor mental disorders (maximum 3 months); (iv) aged 18–60; and (v) Dutch speaking. As the intervention was aimed at patients on sick leave because of minor mental disorders, patients were screened for the absence of moderately severe or severe mood disorder (major depressive disorder, bipolar disorder), agoraphobia, panic disorder, social phobia, by means of the CIDI,11 a fully structured diagnostic interview, resulting in psychiatric diagnoses according to the DSM-IV1 and the ICD-1012 criteria. Patients already receiving psychotherapy were also excluded. As the study was a pragmatic trial testing the intervention in a heterogeneous group of primary care patients, patients were not screened for other disorders than those mentioned above. According to the CIDI, of the participating subjects, 57 (29%) had a mild depressive disorder, 1 (0.5%) a mild bipolar disorder, 2 dysthymia (1%), 32 (16%) generalized anxiety disorder, and 110 (57%) had no mood or anxiety disorder at baseline. On average, patients were 40 years old (SD 9), 60% were women, 65% had the middle educational level, and 75% had a partner. No significant differences were found between the groups with respect to these characteristics. In Figure 1 the selection of the study sample is presented.

The random sequence was generated and sealed in consecutively numbered envelopes by an administrative assistant not in contact with the patients, with the aid of a dice (evens being intervention group) before the first patient was included. Block randomization (block size four) was used to ensure close balance between the group sizes. Ninety-eight patients were randomized to the intervention group, and 96 to the control group. Prior to the start of the study, approval was obtained from the ethical committee of The Netherlands Institute of Mental Health and Addiction, and informed consent was obtained from all patients.

Treatment: intervention group and control group

Persistent avoidance is hypothesized to be the main reason for prolonged sickness absence, loss of employment, and even permanent work disability.13 Therefore, the experimental intervention, similar to the treatment used in the study by Van der Klink et al.,4 specifically aimed at activating the patient to restore coping and adopt a problem-solving approach towards his problems. The intervention group received five individual sessions of 50 min with a social worker in a period of 10 weeks, the content of which was described in a manual. For the experimental treatment, 11 social workers had received a 3 day training by the researchers, including two follow-up sessions throughout the study period. Treatment entailed three stages: (i) understanding the cause of loss of control (ii) the development of problem-solving strategies; and (iii) their implementation. Patients were motivated to solve work-related problems actively, do homework assignments, and to resume work as soon as possible. Patients in the intervention group were free to see their GP whenever they wanted. Patients in the control group received routine GP care, which could include medication or counselling or even referral. Doctors were not informed about the contents of the experimental intervention and were asked to manage each patient as they would normally. However, they were asked to refer patients only if necessary and exclusively to caregivers who were not trained in the intervention technique.

Clinical outcome assessments

Clinical outcome measures were sick leave duration, functional status, and health status. Sick leave duration was defined as the...
period between the first day of absenteeism and the first day of complete work resumption. Functional status was reflected by the Physical Component Summary Score (PCS) and the Mental Component Summary Score (MCS) of the SF-36. The EuroQol was used to evaluate health status, using weights based on the Dutch population. Both SF-36 and EuroQol scores were obtained at baseline and 3, 6, and 18 months later.

**Service utilization and cost measures**

After patients’ informed consent, medical data were extracted from GPs’ computerized medical records for the time during which patients had participated in the study. Direct health care costs included costs associated with GP care, referral to specialized medical care, physical therapy, nutritionist care, X-ray and laboratory research, and medication. In case of a referral by the GP data on the length of treatment were lacking. Therefore, the average number of sessions per treatment was estimated based on national data of health care utilization, notably 12 sessions for physical therapists, 6 for psychologists, 5 for nutritionists, 6 for social workers. For referrals to medical specialists the number of sessions was not available and set to one session. Estimated prices of health care were derived from recently published Dutch guidelines (table 1). Intervention costs included the development of the programme, and the three day training of social workers in the technique (employee costs per hour), including follow-up training sessions throughout the study.

Indirect costs of production losses for paid labour were calculated by the Friction Cost Method according to the Dutch guidelines for economic evaluations. The Friction Cost Period is the estimated time it costs an employer to replace a sick employee and was estimated to be 154 days for 2004 in The Netherlands. Calculations were based on a mean income of the Dutch population according to age and gender of the employees. In The Netherlands, the elasticity measure between labour time and labour production is 0.8, which means that a reduction of 100% in labour time results in a decrease of 80% in production. Hence, lost productivity costs were calculated as the number of hours of absenteeism, multiplied by 0.8 (the elasticity measure) and multiplied by income.

**Data analysis**

All analyses were carried out on an intention-to-treat basis and were limited to patients completing all follow-up assessments using all available cases for each outcome. Change in SF-36 and EuroQol scores were computed using multilevel analysis. Confidence intervals of the difference in mean costs in both groups (CIs) were computed by bias-corrected and accelerated (BCa) bootstrapping with 2000 replications. A cost–benefit analysis was performed to compare the monetary benefits of the intervention group and the control group. For referrals to medical specialists the number of sessions was not available and set to one session. Estimated prices of health care were derived from recently published Dutch guidelines (table 1). Intervention costs included the development of the programme, and the three day training of social workers in the technique (employee costs per hour), including follow-up training sessions throughout the study.

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**Sensitivity analyses**

To evaluate the robustness and generalizability of the results, four sensitivity analyses were performed. First, a sensitivity analysis was performed using the Human Capital Method to calculate sick leave costs. In the Human Capital Method, the entire period of sick leave is taken into account (whether or not the employee has already been replaced).

Second, sick leave duration was defined as the period between the first day of absenteeism and the first day of work resumption, fully or partially, as opposed to the period between the first day of absenteeism and the first day of full work resumption in the main analysis. Third, in the estimation of health care costs, costs of medical specialist care were underestimated. In this sensitivity analysis five sessions for each referral were used instead of one. Finally, a sensitivity analysis was conducted using the English tariffs (weights) of the Euroqol.

**Results**

At baseline, the mean number of hours/week of paid employment was 33.7 (SD 8.8, median 37) in the experimental group and 34.3 (SD 8.8, median 37) in the control group. After 18 months these were 32.7 (SD 9, median 36) in the experimental group and 32.4 (SD 9, median 36) in the control group.

For six patients the exact sick leave duration was unknown as they dropped out. However, as four of them were indicated not to have resumed work at 3 months after baseline, and two not after 6 months, sick leave duration was estimated to be at least 92 and 182 days, respectively, (considering a month has on average 30.4 days), and they were included in the analyses. Differences in scores on the MCS and PCS of the SF-36 were missing for 33 patients (14 cases, 19 controls) and on the Euroqol for 38 patients (17 cases, 21 controls). Patients with missing data did not materially differ from patients with complete data. In the intervention group, the mean number of visits with a social worker was 4.5 (SD 1.0).

**Clinical outcome and sick leave duration**

During 18 months follow-up, the mean MCS score changed from 28.5 (SD 8.9) to 48.1 (SD 9.2) in the intervention group and from 23.8 (SD 8.3) to 46.0 (SD 11.8) in the control group. Over this period, the PCS score changed from 49.2 (SD 8.9) to 53.7 (SD 7.5) in the intervention group and from 49.9 (SD 8.2) to 52.6 (SD 8.2) in the control group. EuroQol utilities changed from 0.45 (SD 0.36) at baseline to 0.90 (SD 0.16) after 18 months in the intervention group and from 0.45 (SD 0.33) to 0.83 (0.23) in the control group.

Both the MCS scores and health status assessed with the Euroqol were low at baseline and improved considerably in both groups during the first 3 months, after which improvement continued at a slower pace. The PCS score was relatively unaffected at baseline and changed little over time. Multilevel analysis indicated that there were no significant differences between the two groups in improvement between baseline and 3, 6, and 18 months later on the MCS score, PCS score, or Euroqol (data not shown).

The difference in sick-leave duration until full work resumption was small and not statistically significant (3.8 days, 95% CI: −34.5 to 42.3, see table 1).

**Cost–benefit analyses**

Sick leave costs amounted to a mean of Euros 13 721 (SD 6187) in the intervention group and Euros 13 935 (SD 6086.15) in the
### Table 1 Utilization of resources during 18 months follow-up and sick leave duration in intervention and control patients and applied cost prices per unit of resource use

<table>
<thead>
<tr>
<th>Direct health care utilization</th>
<th>Intervention group (n = 96*) (Mean, SD)</th>
<th>Control group (n = 96) (Mean, SD)</th>
<th>Cost prices in Euros</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contacts with General practitioner*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgery contact</td>
<td>5.0 (5.1)</td>
<td>5.7 (5.3)</td>
<td>20.20</td>
</tr>
<tr>
<td>Telephone consultation</td>
<td>0.7 (1.1)</td>
<td>0.6 (1.3)</td>
<td>10.10</td>
</tr>
<tr>
<td>Home visit</td>
<td>0.0 (0.2)</td>
<td>0.5 (0.5)</td>
<td>40.40</td>
</tr>
<tr>
<td>Minor surgical operation</td>
<td>0.5 (0.8)</td>
<td>0.5 (1.0)</td>
<td>40.40</td>
</tr>
<tr>
<td>Prescription</td>
<td>2.6 (4.1)</td>
<td>3.3 (4.6)</td>
<td>10.10</td>
</tr>
<tr>
<td>Contacts with a social worker*</td>
<td>4.7 (1.1)</td>
<td>0.9 (2.4)</td>
<td>46.97</td>
</tr>
<tr>
<td>Referrals to psychologist</td>
<td>0.1 (0.3)</td>
<td>0.1 (0.3)</td>
<td>70.00</td>
</tr>
<tr>
<td>Outpatient appointment</td>
<td>0.4 (0.8)</td>
<td>0.5 (0.8)</td>
<td>56.00</td>
</tr>
<tr>
<td>Referrals to physical therapist (12 sessions)</td>
<td>0.3 (0.6)</td>
<td>0.3 (0.6)</td>
<td>22.75</td>
</tr>
<tr>
<td>Referrals to physical therapist (12 sessions)</td>
<td>0.0 (0.1)</td>
<td>0.1 (0.2)</td>
<td>23.00</td>
</tr>
<tr>
<td>Referrals to nutritionist</td>
<td>0.0 (0.1)</td>
<td>0.0 (0.1)</td>
<td>13.78</td>
</tr>
<tr>
<td>Referrals to haptonomist</td>
<td>0.0 (0.2)</td>
<td>0.0 (0.2)</td>
<td>61.88</td>
</tr>
<tr>
<td>Lab research</td>
<td>1.1 (1.8)</td>
<td>1.3 (2.1)</td>
<td>15.82</td>
</tr>
<tr>
<td>X-ray (without contrast liquid)</td>
<td>0.2 (0.6)</td>
<td>0.2 (0.5)</td>
<td>39.07</td>
</tr>
<tr>
<td>No. of times medication prescribed by GP</td>
<td>5.4 (10.3)</td>
<td>5.3 (10.2)</td>
<td>Variable</td>
</tr>
<tr>
<td>Psychotropic</td>
<td>1.1 (3.9)</td>
<td>1.4 (4.3)</td>
<td>Variable</td>
</tr>
<tr>
<td>Non-psychotropic</td>
<td>4.4 (7.5)</td>
<td>3.9 (7.1)</td>
<td>Variable</td>
</tr>
<tr>
<td>Indirect costs**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sick leave duration until full work resumption (in days)*</td>
<td>152.7 (122.0)</td>
<td>156.5 (121.1)</td>
<td>Variable</td>
</tr>
<tr>
<td>Sick leave duration until work resumption, partially or fully (in days)*</td>
<td>106.0 (87.2)</td>
<td>120.9 (94.4)</td>
<td>Variable</td>
</tr>
<tr>
<td>Development of the intervention (total)$</td>
<td>–</td>
<td>–</td>
<td>2573.40</td>
</tr>
<tr>
<td>Training of social workers (n = 11) (total)$</td>
<td>–</td>
<td>–</td>
<td>10731.84</td>
</tr>
</tbody>
</table>

*Two patients from the intervention group (n = 98) withdrew permission to search their medical records.

**Information on sick leave duration was available for 97 patients from the intervention group and 90 of the control group.

a: Price according to recently published Dutch guidelines
b: Price according to professional organisation
c: Mean of the price according to two or more therapists
d: Costs of medication prescribed by GPs were calculated using cost prices
e: Costs for paid labour were calculated according to the Friction Cost method and the Human Capital approach on the basis of the mean income of the Dutch population stratified for age and sex
f: Employee costs per hour

Minor mental disorders and sick leave

Cost-effectiveness analyses

Cost-utility of the intervention versus control treatment is illustrated in a plane in Figure 2. The point-estimate of the cost-utility ratio was Euros 4179 saved per QUALY gained. However, the bootstrap estimates were located equally north and south of the x-axis and it is clear that the cost difference between both treatments was small and not statistically significant (95% CI: –1818 to 1816), although this was still exclusive of the intervention costs.
significant. Analogously, 10% of the bootstrap estimates were positioned west of the $y$-axis, showing that the difference in quality adjusted survival did not reach statistical significance.

All cost-effectiveness analyses are summarized in Table 2. Spread of the bootstrap estimates over the quadrants in the CE-plane show a statistically significant effect-difference for PCS in favour of the intervention. However, this difference was small and clinically not relevant, as compared to norm scores, the PCS scores of both groups were relatively unaffected at baseline and changed little over time. From Table 2 it can be concluded that the intervention was not cost-effective compared to the control treatment.

As effect sizes were missing in subjects with complete cost data and costs have a skewed distribution, the cost differences in the cost-effectiveness analysis ($n = 155$) deviate from the cost differences estimated in the cost–benefit analysis ($n = 185$), for which reason the results reported in the text do not completely match those presented in Table 2. Analogously, the effect differences are slightly different from those estimated in the effectiveness analysis.

The sensitivity analyses did not yield significantly different results from the main analyses. According to the Human Capital Method, mean costs in Euros of sick leave duration until full work resumption were 29 308.30 (SD 26199.94) for the intervention group and 32 708.56 (SD 29 245.90) for the control group. When sick leave was defined as the period between the first day of absenteeism to the first day of work resumption, partially or fully, mean costs in Euros were 11 309.22 (SD 5854.12) for the intervention group and 11 978.64 (SD 5699.24) for the control group, according to the Friction Cost method. Finally, the results for the UK valuation of the Euroqol are shown in Table 2.

**Table 2** Cost-effectiveness and cost-utility of an activating intervention by social workers for patients with minor mental disorders compared to usual care by a general practitioner

<table>
<thead>
<tr>
<th>Effect difference</th>
<th>Cost difference</th>
<th>ICER</th>
<th>%NE</th>
<th>%SE</th>
<th>%SW</th>
<th>%NW</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS –1.4</td>
<td>–234</td>
<td>167</td>
<td>9</td>
<td>13</td>
<td>44</td>
<td>34</td>
</tr>
<tr>
<td>PCS 2.9</td>
<td>–234</td>
<td>–81</td>
<td>41</td>
<td>56</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Qualy Dutch (EQ-5D) 0.056</td>
<td>–234</td>
<td>4179</td>
<td>38</td>
<td>52</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Qualy UK (EQ-5D) 0.044</td>
<td>–234</td>
<td>5306</td>
<td>36</td>
<td>53</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

%NE = number of bootstrap estimates in the North-East quadrant; %SE = number of bootstrap estimates in the South-East quadrant; %SW = number of bootstrap estimates in the South-West quadrant; %NW = number of bootstrap estimates in the North-West quadrant.

**Figure 2** Cost-effectiveness plane for the Euroqol scores (intervention versus control group)

**Discussion**

Results from the present study suggest that the activating intervention by social workers was not cost-effective compared with routine GP care. The intervention and control groups did not differ significantly in either medical consumption or in sick leave duration, over the 18 month follow-up period. Even the number of contacts patients had had with their GP was similar in both groups, which suggests that the intervention did not relieve GPs’ workloads.

There are several possible explanations for the intervention not being cost-effective compared with usual care. First, in both groups sick leave costs were so high they overruled other costs (medical costs and the costs of the intervention). Therefore, as the groups did not differ significantly on sick leave duration, they did not differ on total costs either. The finding that social workers were not more successful than GPs in reducing sick leave duration may be explained in two ways: (i) operating in primary care, social workers (as GPs) were not in contact with the workplace and, therefore, could not influence important work-related aspects or people who can encourage or facilitate work resumption and (ii) they may act as the patient’s advocate, valuing patient well-being higher than work resumption, and as such may not stimulate work resumption if the patient thinks this may worsen his situation. This explains
why in contrast to the results presented here, a highly similar intervention conducted by occupational physicians, who by definition are in contact with the workplace, was successful in reducing sick leave duration.

Despite the fact that patient satisfaction with the treatment in the intervention group was higher, no cost-effectiveness differences were found regarding medical consumption, which suggests that patients appreciated having someone to talk to, but, nevertheless, sought a remedy for their stress-related physical symptoms in the medical field. The higher patient satisfaction combined with no additional clinical benefits is a finding confirmed in similar studies.

While discussing the results of the study, several limitations need to be taken into account. First, only the initial sick leave duration period was studied, and information was not gathered on sick leave in the months after patients had resumed work or on patients’ history of absenteeism prior to participation to the study. Therefore, it is unclear whether patients learned from the intervention how to deal with future stress and whether it was effective in preventing new sick leave episodes. Second, indirect costs other than those as a result of absenteeism (e.g. travel expenses) were not taken into account in this study. However, we do not expect these costs to be cost drivers. Third, cost data are highly skewed, owing to many subjects with low costs and few patients with very high costs due to long-term sickness absence. As a result, economic evaluations that accompany clinical evaluations, such as in our study, may be underpowered. By focussing on estimation by presenting confidence intervals and cost-effectiveness planes, rather than on hypothesis testing, the economic evaluation may still reveal important information to decision makers, although results should be interpreted with care. Fourth, because of practical reasons, all patients were citizens of Almere, a fast growing city of about 180,000 inhabitants situated in the greater Amsterdam area. Therefore, participants in this study may not fully represent the average Dutch population. However, it is unlikely that mental problems were overrepresented in this population, as mental health scores reached norm levels within 3–6 months after baseline. Moreover, as both the experimental and control group were recruited in Almere, this is unlikely to have affected the results of the study. Fifth, although GPs were not informed about the content of the intervention under study and has received a fee for speaking at a symposium of social workers specialized in occupational care.

In conclusion, compared with GP routine care, the activating social work intervention was not superior in reducing sick leave duration, improving clinical symptoms, and decreasing medical consumption, and, therefore, was not cost-effective in the treatment of minor mental disorders. Despite the finding that patient satisfaction was higher in the intervention group, investing in implementation of the intervention in its present form does not seem to be justified.

Acknowledgements

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Conflict of interest

Berend Terluin has played an important role in the development of the intervention under study and has received a fee for speaking at a symposium of social workers specialized in occupational care.

Key points

- Patients on sick leave because of emotional problems appreciated the activating structured intervention by social workers, but this did not lead to a reduction in their medical consumption.
- The intervention by social workers did not reduce sick leave duration, in contrast to findings of a previous study, where a highly similar intervention was conducted by occupational physicians.
- Programs aimed at reducing overall costs associated with minor mental disorders should focus on the prevention of long-term absenteeism, as costs associated with sick leave in this group are very high.

References


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