



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

University of Wollongong
Research Online

Faculty of Social Sciences - Papers

Faculty of Social Sciences

2015

Economic evaluation of concise Cognitive Behavioural Therapy and/or pharmacotherapy for depressive and anxiety disorders

Denise Meuldijk

University of Wollongong, meuldijk@uow.edu.au

Ingrid V. Carlier

Leiden University

Irene M. Van Vliet

Leiden University

Albert M. van Hemert

Leiden University

Frans G. Zitman

Leiden University

See next page for additional authors

Publication Details

Meuldijk, D., Carlier, I. V. E., van Vliet, I. M., van Hemert, A. M., Zitman, F. G. & van den Akker-van Marle, M. E. (2015). Economic evaluation of concise Cognitive Behavioural Therapy and/or pharmacotherapy for depressive and anxiety disorders. *Journal of Mental Health Policy and Economics*, 18 (4), 175-183.

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library:
research-pubs@uow.edu.au

Economic evaluation of concise Cognitive Behavioural Therapy and/or pharmacotherapy for depressive and anxiety disorders

Abstract

BACKGROUND: Depressive and anxiety disorders cause great suffering and disability and are associated with high health care costs. In a previous conducted pragmatic randomised controlled trial, we have shown that a concise format of cognitive behavioural- and/or pharmacotherapy is as effective as standard care in reducing depressive and anxiety symptoms and in improving subdomains of general health and quality of life in secondary care psychiatric outpatients. **AIMS OF THE STUDY:** In this economic evaluation, we examined whether a favourable cost-utility of concise care compared to standard care was attained. **METHODS:** The economic evaluation was performed alongside a pragmatic randomised controlled trial. Health-related quality of life was measured using the Short-Form (SF-36) questionnaire. Cost of healthcare utilization and productivity loss (absenteeism and presenteeism) were assessed using the Trimbos/iMTA questionnaire for Costs associated with Psychiatric Illness (TiC-P). A cost-utility analysis, using cost-effectiveness acceptability curves, comparing differences in societal costs and Quality-Adjusted Life Years (QALYs) at 1 year was performed. **RESULTS:** One year after study entry, the difference in mean cost per patient of the two primary treatments was not significant between both groups. No significant differences in other healthcare and non-healthcare costs could be detected between patients receiving concise care and standard care. Also, QALYs were not statistically different between the groups during the study period. From both the societal and healthcare perspective, the probability that concise care is more cost-effective compared to standard care remains below the turning point of 0.5 for all acceptable values of the willingness to pay for a QALY. The economic evaluation suggests that concise care is unlikely to be cost-effective compared to standard care in the treatment for depressive- and anxiety disorders in secondary mental health care during a one year follow up period. **DISCUSSION:** Total costs and QALYs were not significantly different between standard and concise care, with no evidence for cost-effectiveness of concise care in the first year. The longer impact of concise care for patients with mild to moderate symptoms of depressive and/or anxiety disorders compared to standard care in secondary care needs to be further studied. **IMPLICATIONS:** This economic evaluation failed to find significant differences in cost between concise and standard care over the study period of one year. Replication of our economic evaluation might benefit from an extended follow-up period and strict adherence to the study protocol. If concise care will be found to be cost-effective in the long term, this would have major implications for recommendations how to optimize secondary mental health care in the treatment of depressive - and anxiety disorders.

Keywords

disorders, anxiety, pharmacotherapy, depressive, therapy, economic, behavioural, cognitive, concise, evaluation

Disciplines

Education | Social and Behavioral Sciences

Publication Details

Meuldijk, D., Carlier, I. V. E., van Vliet, I. M., van Hemert, A. M., Zitman, F. G. & van den Akker-van Marle, M. E. (2015). Economic evaluation of concise Cognitive Behavioural Therapy and/or pharmacotherapy for depressive and anxiety disorders. *Journal of Mental Health Policy and Economics*, 18 (4), 175-183.

Authors

Denise Meuldijk, Ingrid V. Carlier, Irene M. Van Vliet, Albert M. van Hemert, Frans G. Zitman, and M E. van den Akker-van Marle

Economic evaluation of concise cognitive behavioural therapy and/or pharmacotherapy for depressive and anxiety disorders; a pragmatic randomised controlled equivalence trial in routine secondary care

Denise Meuldijk,¹ Ingrid V.E. Carlier,² Irene M. van Vliet,³ Albert M. van Hemert,⁴ Frans G. Zitman,⁵ M. Elske van den Akker- van Marle⁶

¹*MSc., Department of Psychiatry, Leiden University Medical Centre, Leiden, The Netherlands*

²*PhD., Department of Psychiatry, Leiden University Medical Centre, Leiden, The Netherlands*

³*M.D., Department of Psychiatry, Leiden University Medical Centre, Leiden, The Netherlands*

⁴*Prof., Department of Psychiatry, Leiden University Medical Centre, Leiden, The Netherlands*

⁵*Prof., Department of Psychiatry, Leiden University Medical Centre, Leiden, The Netherlands*

⁶*PhD., Department of Medical Decision Making, Leiden University Medical Centre, Leiden,*

The Netherlands

***Correspondence to:** Denise Meuldijk, MSc, Leiden University Medical Centre,

Department of Psychiatry, P.O. Box 9600, 2300 RC, Leiden, the Netherlands.

Tel: +31-(0)71-5263785

Fax: +31-(0)71-5248156

E-mail: d.meuldijk@lumc.nl

Source of funding: This is a collaborative study between Rivierduinen (RD) and the department of Psychiatry of the LUMC and is funded entirely by RD. RD is a secondary Regional Mental Health Provider (RHMP) in the province of South-Holland, the Netherlands. The funding source contributed to the study design and enrollment of participants but had no role in data collection, data analysis, data interpretation or writing of the report. The corresponding author had full access to all study data and had final responsibility for the decision to submit for publication.

Trial registration: Netherlands Trial Registry NTR2590

Abstract

Background: Depressive and anxiety disorders cause great suffering and disability and are associated with high health care costs. In a previous conducted pragmatic randomised controlled trial, we have shown that a concise format of cognitive behavioural- and/or pharmacotherapy is as effective as standard care in reducing depressive and anxiety symptoms and in improving subdomains of general health and quality of life in secondary care psychiatric outpatients.

Aims of the Study: In this economic evaluation, we examined whether a favourable cost-utility of concise care compared to standard care was attained.

Methods: The economic evaluation was performed alongside a pragmatic randomised controlled trial. Health-related quality of life was measured using the Short-Form (SF-36) questionnaire. Cost of healthcare utilization and productivity loss (absenteeism and presenteeism) were assessed using the Trimbos/iMTA questionnaire for Costs associated with Psychiatric Illness (TiC-P). A cost-utility analysis, using cost-effectiveness acceptability curves, comparing differences in societal costs and Quality-Adjusted Life Years (QALYs) at 1 year was performed.

Results: One year after study entry, the difference in mean cost per patient of the two primary treatments was not significant between both groups. No significant differences in other healthcare and non- healthcare costs could be detected between patients receiving concise care and standard care. Also, QALYs were not statistically different between the groups during the study period. From both the societal and healthcare perspective, the probability that concise care is more cost-effective compared to standard care remains below the turning point of 0.5 for all acceptable values of the willingness to pay for a QALY. The economic evaluation suggests that concise care is unlikely to be cost-effective compared to standard care in the treatment for depressive- and anxiety disorders in secondary mental health care during a one year follow up period.

Discussion: Total costs and QALYs were not significantly different between standard and concise care, with no evidence for cost-effectiveness of concise care in the first year. The longer impact of concise care for patients with mild to moderate symptoms of depressive- and/or anxiety disorders compared to standard care in secondary care needs to be further studied.

Implications : This economic evaluation failed to find significant differences in cost between concise and standard care over the study period of one year. Replication of our economic evaluation might benefit from an extended follow-up period and strict adherence to the study protocol. If concise care will be found to be cost-effective in the long term, this would have major implications for recommendations how to optimize secondary mental health care in the treatment of depressive- and anxiety disorders.

Keywords: Cost-effectiveness, Routine Outcome Monitoring, Randomised controlled trial, Concise care, Secondary care, Anxiety, Depression, Healthcare utilization

Introduction

Depressive and anxiety disorders are highly prevalent in clinical practice, causing great suffering and disability, and having a considerable impact on individuals, health services and society.¹⁻³ Several psycho- and pharmacotherapeutic treatments are widely applied and have been shown to provide adequate treatment for these disorders. However, they place an increased demand on health and social care resources, causing a considerable economic burden.⁴⁻⁶ Offering these treatments in a more concise form, in which treatments are confined to a maximum number of sessions within a fixed time-period, can yield savings in both healthcare and societal costs. As a result, costs of treatment could be lowered while maintaining clinical effectiveness, resulting in a favourable cost-effectiveness of concise care compared to standard care.

In a recent pragmatic randomised controlled trial,⁷ we compared a concise, time restricted approach of psycho- and/or pharmacotherapy with standard routine care in the treatment of secondary care outpatients with an anxiety- and/or depressive disorder. Both standard and concise care equally succeeded in reducing depressive- and anxiety complaints and improved current general health status and subdomains of quality of life (e.g. functional status and physical functioning) during the first year after study entry. We concluded that a concise format of psycho- and/or pharmacotherapy is as effective as standard care in the treatment of outpatients with a mild to moderate depressive- and/or anxiety disorders (see Meuldijk (2015) and colleagues).⁸ In addition, since health care budgets are shrinking, an economic evaluation of this effect is desired to inform decisions which health care services to offer. This paper reports about the cost-effectiveness (cost-utility) of concise care versus standard care. We performed an economic evaluation based on the data of our

randomised controlled trial,⁸ to determine whether, given the similar clinical effectiveness, a favourable cost-effectiveness for concise care is attained, one year after study entry.

Methods

Study Design

An economic evaluation was embedded in a pragmatic, randomised controlled trial of equivalence examining the effectiveness of concise care in patients with a mild to moderate anxiety- and/or depressive disorder.⁷ The study was approved by the Medical Ethical Committee (MEC) of the Leiden University Medical Centre (LUMC) and adhered to the consolidated standards for reporting randomised controlled equivalence trials.⁹⁻¹¹ The trial was conducted at five Dutch outpatient Mental Healthcare Centres (MHCs) of the Regional Mental Health Provider (RMHP) Rivierduinen. In short, between March 2010 and December 2012, 182 patients were enrolled. These patients (aged 18-65 years) with a mild to moderate anxiety- and/or depressive disorder were randomly allocated to concise or standard care. Patients with suicidal or homicidal risk, severe social dysfunction, delusions, hallucinations and/or suffering from bipolar or psychotic disorders were excluded from the trial. Co-morbidity with other psychiatric disorders was allowed. Patients' progress and clinical effectiveness of treatment were assessed by touch-screen Routine Outcome Monitoring (ROM), and planned at baseline (T₁), 3 months (T₂), 6 (T₃) and 12 (T₄) months after baseline. Written informed consent was obtained from all participants before study entry. The baseline characteristics of both groups were similar.⁸ Details on the methodology and design of this randomised clinical trial and the clinical effectiveness results are reported elsewhere.^{7,8}

Treatments

In both concise and standard care, a choice could be made between pharmacotherapy with a selective serotonin reuptake inhibitor (SSRI)¹³ or psychotherapy with Cognitive Behavioural Therapy (CBT)^{14,15} or, in case of a posttraumatic stress disorder, Eye Movement Desensitization and Reprocessing-therapy (EMDR).¹⁶ Concise care is characterized by a quick onset, a fixed number of weekly sessions (maximum of 7 sessions) within a 7-week fixed time period after which concise care ends. If insufficiently helped by this initial treatment, continuation of (additional) treatment, according to the stepped-care principles,¹⁷⁻¹⁹ was possible.

Standard care is not confined to a maximum number of sessions or within a fixed time-period and could continue during the entire study period of 1 year. The treatment protocols in concise and standard care followed the Dutch guidelines for the evidence-based treatment of depressive and anxiety disorders,¹⁷ thereby advocating a stepped-care approach.^{18,19} Details of the treatment can be found elsewhere.⁷

Measures

The information for the economic evaluation was captured during the entire study period of one year. Generic health-related quality of life was assessed with the Short Form-36 Health Survey (SF-36)^{20,21} at baseline and at the subsequent follow-up measurements. Use of medical resources and productivity loss were assessed with the Trimbos/iMTA questionnaire for Costs associated with Psychiatric Illness (TiC-P),^{22,23} 3, 6 and 12 months after baseline.

Quality of life

The SF-36^{20,21} is a 36-item self-report questionnaire that measures health status in eight domains: physical functioning, social functioning, physical problems, emotional problems, mental health, vitality, bodily pain and general health. The SF-36 has good psychometric properties and is proven useful in differentiating the health benefits produced by a wide range of different treatments. The SF-36 scores were used to calculate utilities.²⁴ These represent the societal valuation of the health-related quality of life of the patients on a scale from '0' ('as bad as death') to '1' ('perfect health'). Quality-adjusted life-years (QALYs) were estimated by applying the area-under-the-curve method. QALYs take into account both the quantity and quality of life generated by health care interventions and offer the possibility of comparison of the impact with other medical interventions, which is preferred for economic evaluations.^{25,26}

Healthcare and non-healthcare costs

The economic evaluation was undertaken from a societal perspective, and included costs due to health care resource utilisation (healthcare costs) and costs attributable to production losses (non-healthcare cost). Data on costs of primary treatment (either standard or concise care) were assessed from case-record forms in which type of contact (face-to-face, telephone, e-mail), type of visit (psychologist, psychiatrist, psychotherapists, and other) and time per contact was collected, directly from the participating centres. Costs of crisis therapy/contacts were also included. Other healthcare and non-healthcare costs from the patients were collected using the TiC-P questionnaire.^{22,23} The first part of the TiC-P measures medical resource utilization by

asking for the number of contacts with different (para)medical and psychological health-care providers (e.g. general practitioner (GP), psychiatrist, medical specialist, physiotherapist, alternative health practitioner, day care/hospital length of stay) during the past 4 weeks.²² When calculating the costs, it was assumed that the number of contacts and/or days in those 4 weeks to be representative for the total period between assessments (i.e.: 3 months between T₁ – T₂, 3 months between T₂- T₃, 6 months between T₃- T₄). To estimate health service use over the total period, we interpolated the frequencies of contacts within these four weeks, to the total observed period between assessments. The number of medical contacts were multiplied by reference unit costs of the corresponding health care services. All costs were adjusted to the year 2013 according to the consumer price index²⁷ and are presented in euros. The TiC-P questionnaire was adjusted for the current study: open-ended questions were categorized to be suitable using the touch screen ROM method (e.g. ‘How often did you visit the GP in the past 4 weeks?’: 1 time, 2 to 5 times, 5 to 10 times, 10 times or more). Absence from work, reduced efficiency at work, difficulties with job performance (absenteeism from paid work), and production losses without absenteeism from paid work (e.g. presenteeism) are measured in the second part of the TiC-P. Work absenteeism is measured by two questions related to short- and long-term absence (< 2 weeks and > 2 weeks) from work. For the current study, only data on short-term absence was available. Again, we interpolated the short-term absence to the total time period between two assessments. Costs of absenteeism from paid work were calculated according to the Friction Cost (FC) method.²⁸ With this method, the number of hours patients were absent from their job is multiplied with the actual gross wage per hour for the duration of the friction period, i.e.

the timespan organisations need to restore the initial production level. In the Netherlands, the friction period is set at 23 weeks.²⁹

Presenteeism is measured by asking patients how many days at work their health problems hinders their performance while at work and their efficiency on these days, scored on a scale ranging from '0' (could not do anything) to '10' (able to do as much as normally). Presenteeism costs were calculated by weighing the number of working days impaired by the efficiency score and interpolating these estimates of productivity loss due to presenteeism in the past 2 weeks to the total time period between two assessments (assuming 240 eligible work days/year).

Data Analytic Procedures

All analyses followed the intention-to-treat principle. A total of 182 patients participated in the randomized controlled trial and were randomised to either standard care (n=89) or concise care (n=93). Full economic and outcome data were available at T₂, T₃, and T₄ for respectively 57%, 36% and 23% of the total patients (CONSORT Flow of participants diagram see Meuldijk (2015) and colleagues).⁸ To impute missing cost and effect data, Multiple Imputation (MI) according to the Multivariate Imputation by Chained Equations (MICE) algorithm with 10 iterations for the switching regression model was done.^{30,31}

Differences in (societal) costs were compared between both groups for the total number of 182 patients. In the cost-utility analysis societal costs and QALYs based on the SF-36 from the start of the study until the end of the first year were compared. Subsequently, cost-effectiveness acceptability curves (CEACs) were constructed. They represent the probability that, given a certain threshold for the willingness to pay for a QALY, concise

care is cost-effective in comparison with standard care. Cost-effectiveness is plausible, when the probability that concise care is effective exceeds 0.5 for a given willingness-to-pay. The Dutch economic threshold for willingness to pay is assumed to be between €20,000 and €80,000 per QALY.^{32,33} Cost analyses were conducted with Stata 9.2 (Stata Corp, College Station, Texas, USA) and IBM SPSS version 20 for Windows (SPSS Inc., Chicago, IL, USA).

Results

The study design planned assessments to be performed at baseline, 3, 6, and 12-months post-baseline, referred to as respectively T₁, T₂, T₃ and T₄. Due to the pragmatic nature of our study design, patients had large differences in follow-up periods between assessments. To enhance comparability, the time horizon to assess QALYs and costs, was set at one year after the baseline measurement (T₁) for each individual patient.

Healthcare and non-healthcare costs

Table 1 shows the estimated total mean healthcare and non-healthcare costs per patient over the study period. Direct costs associated with the primary treatments (including psycho- and pharmacotherapy contacts) and crisis contacts were €759 in the concise care group compared to €655 in the standard care group. This difference was non-significant (Table 1). Moreover, the non-significant differences in mean number of contacts between groups are presented in Table 1, Appendix 1. Combined with other hospital costs (including hospital admission, specialist contacts) and healthcare costs outside the hospital (i.e. physiotherapy, general practitioner care, alternative medicine, home care) mean total healthcare costs per patient are €4,761 for concise care and €2,881 for standard care, which results in a non-significant difference of €1,180 (95% CI -5006 to 1246) between the two treatment groups. Cost due to outpatient visits (see Table 1) were the greatest contributor to mean total costs. Productivity loss due to absenteeism and presenteeism moreover resulted in a non-significant difference (€2915, 95% CI -12453 to 6622) in non-healthcare costs. Societal costs (sum of healthcare + non-healthcare

costs) over the total study period were approximately €44,366 for concise and €39,570 for standard care, which is a non-significant difference (Table 1).

Table 1 Mean costs per patient after concise and standard care for a follow-up period of one year.

	Concise care (n=93)		Standard care (n=89)		Difference (95% CI)	
	% ¹	Costs, Euro (€) (±SD)	% ¹	Costs, Euro (€) (±SD)	Costs, Euro (€)	P-value
Primary treatment ²	80.7	759 (1498)	75.3	655 (954)	104 (-260 to 468)	0.58
- Cognitive Behavioural Therapy	76.3	679 (1365)	71.9	586 (934)	93 (- 246 to 432)	0.59
- Pharmacotherapy	29.0	64 (156)	30.3	54 (120)	10 (-31 to 50)	0.64
- Crisis contacts	8.6	17 (82)	5.6	15 (116)	1 (-28 to 31)	0.93
General Practitioner (GP)	72.8	790 (946)	71.9	617 (789)	173 (-153 to 499)	0.29
Ambulatory mental health services	75.7	2010 (2282)	82.7	1943 (2028)	68 (-832 to 967)	0.88
Psychiatrist/psychologist/psychotherapist	52.8	1277 (1809)	39.2	1079 (1872)	198 (-636 to 1032)	0.62
Company physician	65.1	486 (665)	60.2	409 (633)	77 (- 203 to 356)	0.58
Outpatient visits	88.2	4327 (3275)	83.0	3657 (3271)	670 (- 377 to 1716)	0.21
Day care (hospital)	26.7	141 (279)	22.1	111 (223)	31 (-93 to 154)	0.60
Hospital days	31.0	865 (1451)	29.4	888 (1793)	24 (-823 to 776)	0.95
Physical therapist	69.9	743 (708)	71.5	688 (653)	55 (-218 to 328)	0.68
Social worker	33.3	411 (841)	35.1	389 (783)	22 (-475 to 519)	0.92
Centre for Drugs and Alcohol Addiction	30.8	344 (593)	28.2	289 (541)	55 (-242 to 352)	0.70
Paid domestic care	16.9	267 (564)	16.9	276 (637)	-9 (-255 to 237)	0.94
Alternative care	79.7	2341 (2189)	70.1	1880 (2039)	461 (-265 to 1187)	0.21
Total Healthcare costs (sd)	100.0	14761 (9431)	100.0	12881 (8715)	1880 (-1246 to 5006)	0.23
Self-help	66.3	2123 (3069)	61.4	1650 (2541)	474 (-973 to 1920)	0.49
Absenteeism	66.2	17806 (21217)	60.0	16466 (20736)	1340 (-5690 to 8369)	0.71
Presenteeism	78.6	9675 (10664)	84.4	8573 (9022)	1102 (-2479 to 4682)	0.54
Total non-healthcare costs (sd)	91.4	29605 (26619)	93.2	26689 (24404)	2915 (-6622 to 12453)	0.54
Total societal cost (sd)	100.0	44366 (32427)	100.0	39570 (29739)	4795 (-6384 to 15975)	0.30

Note: Mean costs are presented as mean (±standard deviation [SD]).

¹Percentages of patients who made costs for that item unless stated otherwise; *t* test for unequal variance corrected for nonresponse with multiple imputation. CI=Confidence Interval.

²Face to Face, No Show, Telephone and/or email contacts primary treatment.

Quality of life

Utility scores were comparable between both conditions during the study period (Figure 1).

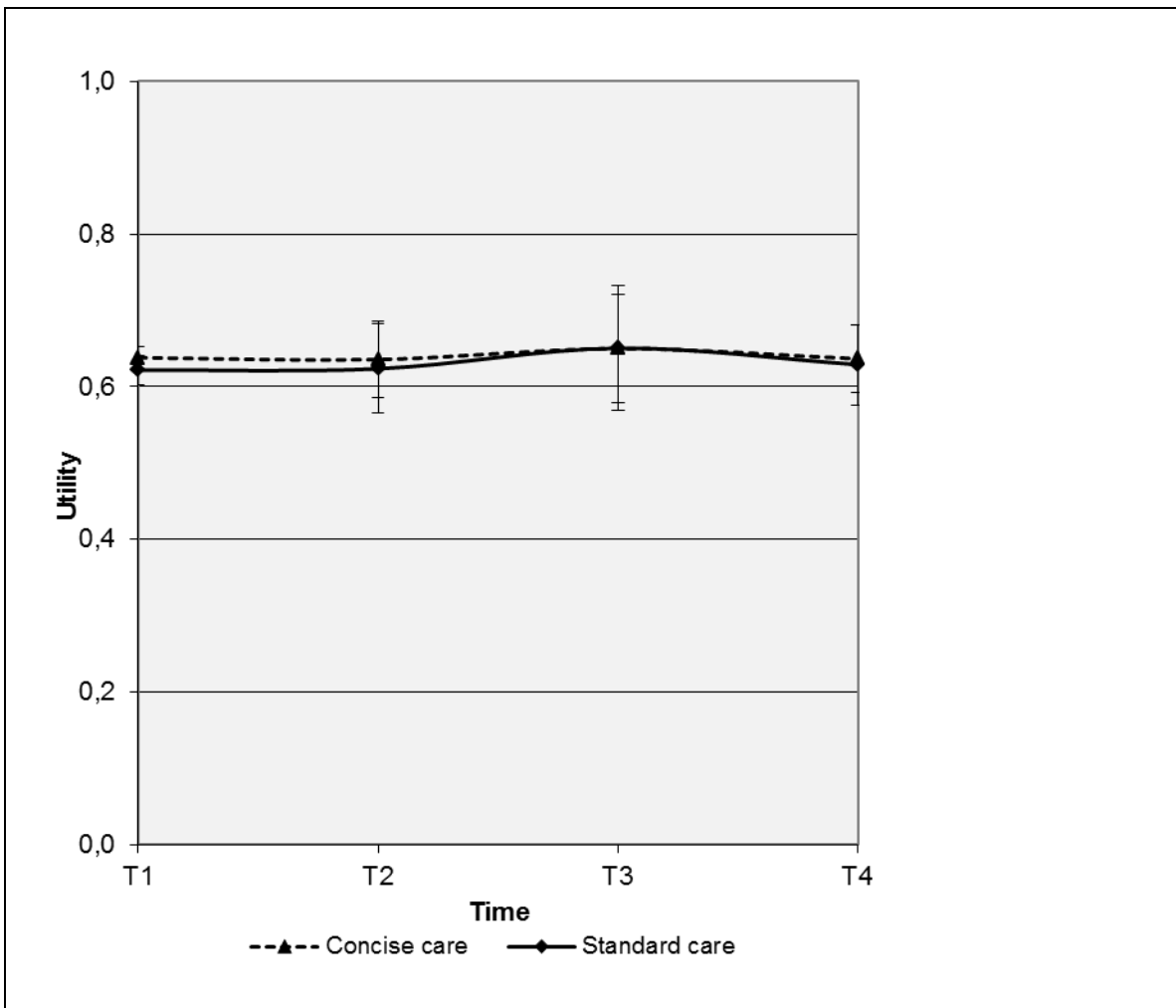


Figure 1 Utilities with 95% confidence intervals for concise care and standard care.

Note: T¹: baseline assessment; T²: 3 month assessment; T³: 6 month assessment; T⁴: 12 month assessment.

As a result, total QALYs (SD) over the study period were 0.633 (0.077) for concise care and 0.628 (0.074) for standard care. The difference in QALYs between concise and standard care was not statistically different (difference: -0.005; 95% confidence interval -0.032 to 0.022, $p=0.73$).

Cost Utility Analysis

The cost-effectiveness acceptability curves (CEAC) indicates the probability of concise care being cost-effective. Analyses indicate that for varying levels of the willingness-to-pay (WTP) threshold, the probability that concise care is more cost-effective compared to standard care remains below the turning point of 0.5 (see Figure 2). The CEACs show a probability below 25% that concise care will be considered cost effective for all values of the willingness to pay considered acceptable for the Dutch situation.^{32,33}

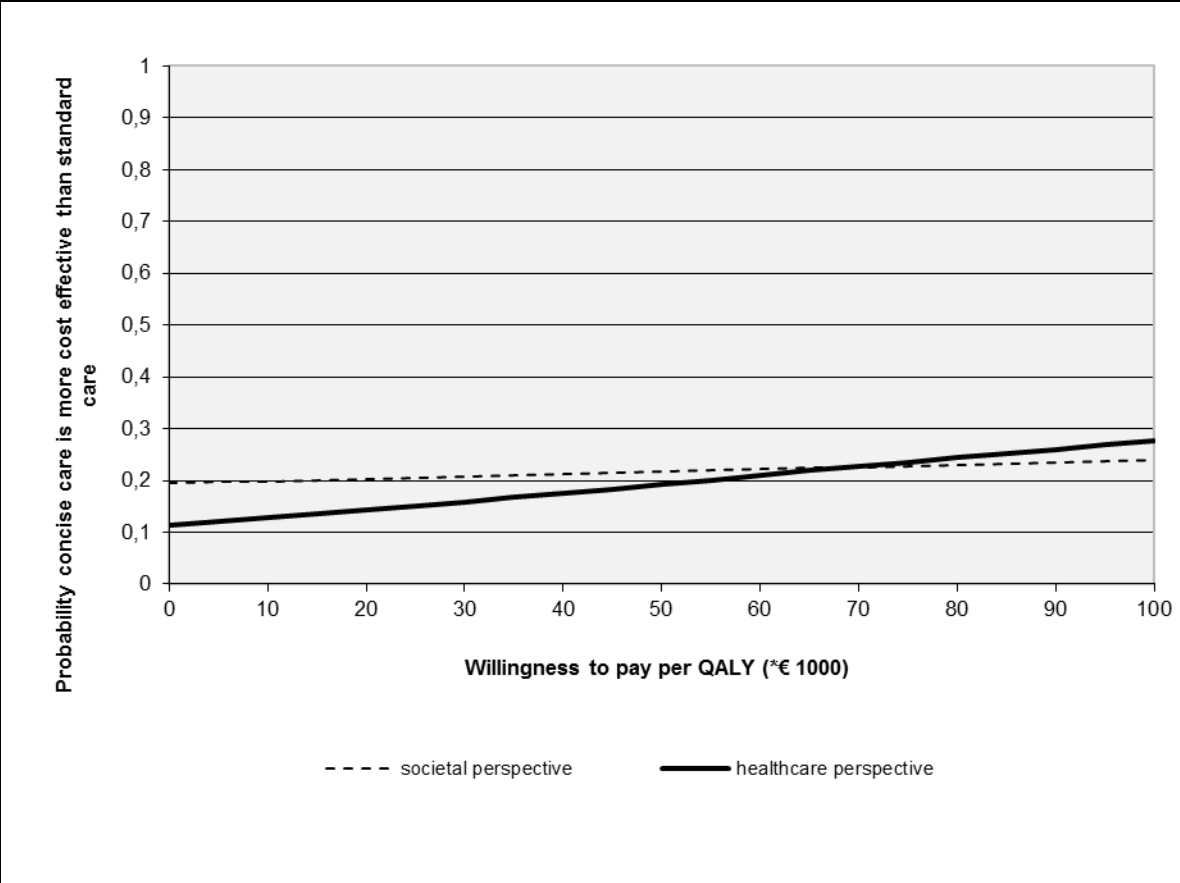


Figure 2 Cost-effectiveness acceptability curves for concise care compared with standard care for a follow-up period of one year.

Discussion

Main findings

Cost comparisons between concise care and standard care, in the treatment of mild to moderate depressive and anxiety disorders in secondary mental health care, did not reveal any significant differences in mean healthcare and societal costs over a study period of one year. The mean cost of the primary treatments were estimated at €759 and €655 (difference €104; 95% CI - €260 to €468) for concise and standard care respectively. Also, after considering other healthcare- and non-healthcare cost over the study period, no significant differences between treatment groups could be detected. In both groups, most of the healthcare costs were caused by non-psychiatric outpatient visits, supporting the frequent observation that persons with depressive or anxiety disorders have many other health problems.³⁴ The QALYs based on the SF36 did not differ significantly either. Our results demonstrate that the reduction of depression and anxiety symptoms and improved subdomains of health related quality of life associated with concise care compared to standard care (see Meuldijk and colleagues)⁸ were not reflected in the utility scores and achieved without significant differences in costs. Therefore, this study failed to demonstrate a favourable cost-utility for concise care in comparison with standard care. Our results are in line with earlier studies examining cost-effectiveness of brief psychological treatments.³⁵⁻³⁷ In most of these studies the differences in total healthcare costs between brief therapy and standard care were very small and not statistically significant.

Limitations

There are certain methodological considerations about our study that need to be addressed as well. Firstly, the relatively small sample size and the substantial number of patients who did not complete treatment or were lost to assessment (see Meuldijk (2015) and colleagues)⁸, for which we accounted by Multiple Imputation (MI), is worth noticing. Although MI is a sophisticated imputation technique, even this method of dealing with missing data is precarious because of the large amount of missing data in this trial especially at the final follow up moments.^{38,39} Secondly, our study was underpowered to detect relevant cost differences, which is reflected in the wide confidence intervals around the cost estimates. Unfortunately, this is a common problem in economic evaluations alongside clinical trials in a natural setting.⁴⁰ Moreover, the design of the study as a RCT in a pragmatic setting resulted in considerable differences in follow-up periods between patients and groups. Therefore, the time horizon for the economic evaluation was set at one year after baseline measurement. However, this time period of one year might not be long enough to capture the full costs and the long term effects of concise care and standard care, and may turn out to be a limitation of this trial. One might speculate that concise care is completed by the end of the follow-up period while patients in the standard care group could still be provided with healthcare. It is therefore possible that the potential savings in concise care were not fully visible after one year and may need a longer follow-up period. An additional methodological limitation was that in practice, not all patients were offered concise care as planned in the study protocol. Although the majority of patients was offered concise care within the first 3 months, the duration of concise care was prolonged and continued during the entire study period,

resulting in non-significant higher costs of primary treatment in concise care compared to standard care in the first year. More strictly adhering the treatment protocol, whereby the number of sessions is realized as planned in the protocol and within the scheduled time-period, could lead to lower costs of concise care. In this situation concise care may help to reduce waiting lists by the earlier completion of treatment and could be also more successful in meeting the preferences of the patients.^{42,43}

Finally, study outcomes were assessed by Routine Outcome Monitoring (ROM), a procedure already in use in the participating outpatient clinics.⁴¹ Since ROM is computer-based (touch-screen) and therefore does not allow open answer format questions, some items of the TiC-P questionnaire were categorized. Respondents had to choose an answer from a given number of options, which might have resulted in less exact answers. Moreover, data related to medication use costs were not available for the economic evaluation because of the open answer format of computer-based measuring.

Implications

However, the pragmatic study design, is also an important strength of this economic evaluation. It offers an opportunity to evaluate the cost-effectiveness of concise care under real world conditions, this increases external validity, and greatly enhances the generalizability of the findings to clinical practice.^{44,45} We conducted this large-scale multicenter RCT in the naturalistic clinical setting of routine mental health care services for secondary care in The Netherlands, reflecting normal day-to-day clinical practice in a regular ‘real life’ psychiatric outpatient population.

To our knowledge, this is one of the first studies to assess the cost-utility of concise care alongside a clinical effectiveness trial in a secondary care setting. According to our results, symptoms of depressive and anxiety disorders were reduced to a similar extent and concise and standard care are comparable in terms of costs, no statistically significant differences in total costs and/or QALYs were found between both groups. This may be due to inadequate sample sizes for the economic evaluation¹. More research overcoming the limitations of the current study and a sufficiently long follow-up period are needed before definite conclusions about the cost-effectiveness of concise care, can be made. Future studies may give insight how to optimize clinical and cost effectiveness and increase the quality of secondary mental healthcare.

Acknowledgments

This is a collaborative study between Rivierduinen (RD) and the department of Psychiatry of the LUMC. The authors thank all the patients participating in this study and the staff at RD: psychiatrists, psychologists, psychiatric test nurses, secretary and all others for their contribution to this research.

¹ Based on the observed standard deviations of the costs per patient in this study, a sample size of more than n=500 patients per condition (power of 80% under the assumption of alpha=0.05) would be needed to show a significant difference in societal costs between both conditions.

References

1. Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study. *Lancet* 1997; **349**: 1498-504.
2. Murray CJ, Lopez AD. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study. *Lancet* 1997; **349**: 1436-42.
3. Kessler RC, Aguilar-Gaxiola S, Alonso J, Chatterji S, Lee S, Ormel J, Ustün TB, Wang, PS. The global burden of mental disorders: an update from the WHO World Mental Health (WMH) surveys. *Epidemiol Psychiatr Soc* 2009; **18**: 23-33.
4. Gustavsson A, Svensson M, Jacobi F, Allgulander C, Alonso J, Beghi E, Dodel R, Ekman M, Faravelli C, Fratiglioni L, Gannon B, Jones DH, Jenum P, Jordanova A, Jönsson L, Karampampa K, Knapp M, Kobelt G, Kurth T, Lieb R, Linde M, Ljungcrantz C, Maercker A, Melin B, Moscarelli M, Musayev A, Norwood F, Preisig M, Pugliatti M, Rehm J, Salvador-Carulla L, Schlehofer B, Simon R, Steinhausen HC, Stovner LJ, Vallat JM, Van den Bergh P, van Os J, Vos P, Xu W, Wittchen HU, Jönsson B, Olesen J; CDBE2010Study Group. Cost of disorders of the brain in Europe 2010. *Eur Neuropsychopharmacol* 2011; **21**: 718-79.
5. Smit F, Cuijpers P, Oostenbrink J, Batelaan N, de Graaf R, Beekman A. Costs of nine common mental disorders: implications for curative and preventive psychiatry. *J Ment Health Policy and Econ* 2006; **9**: 193-200.

6. Nutt DJ. The full cost and burden of disorders of the brain in Europe exposed for the first time. *Eur Neuropsychopharmacol* 2011; **21**: 715-7.
7. Meuldijk D, Carlier IV, van Vliet IM, Zitman FG. A randomized controlled trial of the efficacy and cost-effectiveness of a brief intensified cognitive behavioral therapy and/or pharmacotherapy for mood and anxiety disorders: design and methods. *Contemp Clin Trials* 2012; 33: 983-92.
8. Meuldijk D, Carlier IV, van Vliet IM, van Veen, T, Wolterbeek, R., van Hemert, AM, Zitman FG. The clinical effectiveness of concise cognitive behavioural therapy and/or pharmacotherapy for depressive and anxiety disorders in secondary care; a pragmatic randomised controlled equivalence trial in routine care, *submitted for publication*.
9. Moher D, Hopewell S, Schulz KF, Montori V, Gøtzsche PC, Devereaux PJ, Elbourne D, Egger M, Altman DG. CONSORT 2010 explanation and elaboration: updated guidelines for reporting parallel group randomised trials. *BMJ* 2010; **340**: c869.
10. Hopewell S, Clarke M, Moher D, Wager E, Middleton P, Altman DG, Schulz KF, CONSORT Group. CONSORT for reporting randomized controlled trials in journal and conference abstracts: explanation and elaboration. *PLoS Med* 2008; **5**: e20.

11. Piaggio G, Elbourne DR, Pocock SJ, Evans SJ, Altman DG. Reporting of noninferiority and equivalence randomized trials: extension of the CONSORT 2010 statement. *JAMA* 2012; **308**: 2594-604.
12. de Beurs E, den Hollander-Gijsman ME, van Rood YR, van der Wee NJ, Giltay EJ, van Noorden MS, van der Lem R, van Fenema E, Zitman FG. Routine outcome monitoring in the Netherlands: practical experiences with a web-based strategy for the assessment of treatment outcome in clinical practice. *Clin Psychol Psychother* 2011; **18**: 1-12.
13. Guy W. *ECDEU Assessment Manual for Psychopharmacology*. National Institute of Mental Health (U.S.). Rockville, MD; 1976.
14. Beck JS. *Cognitive Therapy: basic and beyond*. New York: Guilford Press; 1995.
15. Clark DM, Salkovskis P.M. *Cognitive Treatment for panic attacks: Therapist's Manual*. Department of Psychiatry, University of Oxford; 1987.
16. Shapiro F. *Eye Movement Desensitization and Reprocessing (EMDR): Basic Principles, Protocols*. Guilford Press; 1995.
17. Van Fenema, van der Wee NJ, Bauer M, Witte CJ, Zitman FG. Assessing adherence to guidelines for common mental disorders in routine clinical practice. *Int J Qual Health Care* 2012; **24**: 72-9.
18. Haaga DAF. Introduction to the special section on stepped care models in psychotherapy. *J Consult Clin Psychol* 2000; **68**: 547-8.

19. Davison GC. Stepped care: doing more with less? *J Consult Clin Psychol* 2000; **68**: 580-5.
20. Aaronson NK, Muller M, Cohen PD, Essink-Bot ML, Fekkes M, Sanderman R, Sprangers MA, te Velde A, Verrips E. Translation, validation, and norming of the Dutch language version of the SF-36 Health Survey in community and chronic disease populations. *J Clin Epidemiol* 1998; **51**: 1055-68.
21. Ware JE, Snow KK, Kosinski M. *SF-36 Health Survey Manual and Interpretation Guide*. Boston: New England Medical Center, The Health Institute; 1993.
22. Hakkaart-van Roijen L, van Straten A, Donker M, Tiemens B. *Manual Trimbos/IMTA questionnaire for Costs associated with Psychiatric Illness (TiC-P)*. Rotterdam: Institute for Medical Technology Assessment, Erasmus University Rotterdam ; 2002. Available at: www.bmg.eur.nl.
23. Bouwmans C, De JK, Timman R, Zijlstra-Vlasveld M, Feltz-Cornelis C, Tan Swan S, Hakkaart-van Roijen L. Feasibility, reliability and validity of a questionnaire on healthcare consumption and productivity loss in patients with a psychiatric disorder (TiC-P). *BMC Health Serv Res* 2013; **13**: 217.
24. Brazier JE, Roberts J, Deverill M. The estimation of a preference-based measure of health from the SF-36. *J Health Econ* 2002; **21**: 271-92.
25. Brazier JE, Rowen D, Mavranouzouli I, Tsuchiya A, Young T, Yang Y, Barkham M, Ibbotson R. Developing and testing methods for deriving preference-based

- measures of health from condition-specific measures (and other patient-based measures of outcome). *Health Technol Assess* 2012; **16**: 1-114.
26. McDonough CM, Tosteson AN. Measuring preferences for cost-utility analysis: how choice of method may influence decision-making. *Pharmacoeconomics* 2007; **25**: 93-106.
 27. StatisticNetherlands. Consumer price index. July 17, 2008. Available at: www.cbs.nl.
 28. Koopmanschap MA, Rutten FF, van Ineveld BM, van Roijen L. The friction cost method for measuring indirect costs of disease. *J Health Econ* 1995; **14**: 171-89.
 29. Hakkaart-van Roijen L, Tan SS, Bouwmans CAM. Handleiding voor kostenonderzoek, methoden en standaard kostprijzen voor economische evaluaties in de gezondheidszorg [Manual for Cost Research, Methods and Standard Cost Prices for Economic Evaluations in Health Care] Diemen: College voor Zorgverzekeringen; 2010. Available at: www.zorginstituutnederland.nl.
 30. Van Buuren S., Boshuizen, H. C., and Knook, D. L. Multiple imputation of missing blood pressure covariates in survival analysis. *Stat Med* 1999; 18(6) : 681-694.
 31. Van der Heijden GJ, Donders AR, Stijnen T, Moons KG. Imputation of missing values is superior to complete case analysis and the missing-indicator method in multivariable diagnostic research: a clinical example. *J Clin Epidemiol* 2006; 59(10): 1102-1109.

32. Raad voor de Volksgezondheid en Zorg (RVZ)/National Council for Public Health and Health Care: *Sustainable and Meaningful Care* [in Dutch: Zinnige en Duurzame Zorg]. The Netherlands: The Hague; 2006.
33. Smulders YM, Thijs A. [The cost per year of life gained: trends and internal contradictions]. *Ned Tijdschr Geneesk* 2006; **150**: 2467-70.
34. Simon G, Ormel J, VonKorff M, Barlow W. Health care costs associated with depressive and anxiety disorders in primary care. *Am J Psychiatry* 1995; **152**: 352-7.
35. Hakkaart- van Roijen LH, van Straten A, Al M, Rutten F, Donker M. Cost-utility of brief psychological treatment for depression and anxiety. *Br J Psychiatry* 2006; **188**: 323-9.
36. Churchill R, Hunot V, Corney R, Knapp M, McGuire H, Tylee A, Wessely S. A systematic review of controlled trials of the effectiveness and cost-effectiveness of brief psychological treatments for depression. *Health Technol Assess* 2001; **5**: 1-173.
37. Maljanen T, Paltta P, Harkanen T, Virtala E, Lindfors O, Laaksonen MA, Knekt P; Helsinki Psychotherapy Study Group. The cost-effectiveness of short-term psychodynamic psychotherapy and solution-focused therapy in the treatment of depressive and anxiety disorders during a one-year follow-up. *J Ment Health Policy Econ* 2012; **15**: 13-23.

- 38 Carpenter J, Kenward M. Brief comments on computational issues with multiple imputation www.missingdata.org.uk/mi_comp_issues.pdf
- 39 Sterne JA, White IR, Carlin JB, Spratt M, Royston P, Kenward MG, Wood AM, Carpenter JR. Multiple imputation for missing data in epidemiological and clinical research: potential and pitfalls. *BMC* 2009; **338**: b2393
40. Briggs A. Economic evaluation and clinical trials: size matters. *BMJ* 2000; **321**: 1362-3.
41. van Noorden MS, Van Fenema EM, van der Wee NJ, van Rood YR, Carlier IV, Zitman FG, Giltay EJ. Predicting outcomes of mood, anxiety and somatoform disorders: the Leiden routine outcome monitoring study. *J Affect Disord* 2012; **142**: 122-31.
42. Furukawa TA, Noma H, Caldwell DM, Honyashiki M, Shinohara K, Imai H, Chen P, Hunot V, Churchill R. Waiting list may be a nocebo condition in psychotherapy trials: a contribution from network meta-analysis. *Acta Psychiatr Scand* 2014; 130: 181-92.
43. van Schaik DJ, Klijn AF, van Hout HP, van Marwijk HW, Beekman AT, de Haan M, van Dyck R. Patients' preferences in the treatment of depressive disorder in primary care. *Gen Hosp Psychiatry* 2004; **26**: 184-9.
44. Rush AJ, Trivedi MH, Wisniewski SR, Nierenberg AA, Stewart JW, Warden D, Niederehe G, Thase ME, Lavori PW, Lebowitz BD, McGrath PJ, Rosenbaum JF,

Sackeim HA, Kupfer DJ, Luther J, Fava M. Acute and longer-term outcomes in depressed outpatients requiring one or several treatment steps: a STAR*D report.

Am J Psychiatry 2006; **163**: 1905-17.

45. van Straten A, Tiemens B, Hakkaart L, Nolen WA, Donker MC. Stepped care vs. matched care for mood and anxiety disorders: a randomized trial in routine practice. *Acta Psychiatr Scand* 2006; **113**: 468-76.

Appendix I Table 1 Mean number of sessions of primary treatment for a follow-up period of one year.

Number of sessions Primary Treatment ¹	Concise care (n=93)				Standard care (n=89)				P-value
	Mean (±SD)	IQR	Median	Range	Mean (±SD)	IQR	Median	Range	
<i>At 3 months assessment (T²)</i>									
Number of sessions Primary Treatment ¹	10 (20)	2-9	6	0-177	5 (9)	0-7	2	0-47	0.081
Cognitive Behavioural Therapy	8 (17)	1-8	5	0-145	4 (7)	0-6	1	0-37	0.061
Pharmacotherapy	1 (4)	0-0	0	0-26	1 (3)	0-0	0	0-18	0.283
Crisis contacts	0 (2)	0-0	0	0-18	0 (3)	0-0	0	0-31	0.969
<i>At 6 months assessment (T³)</i>									
Number of sessions Primary Treatment ¹	12 (20)	3-14	8	0-177	10 (11)	0-13	8	0-47	0.353
Cognitive Behavioural Therapy	10 (17)	1-12	7	0-145	9 (10)	0-13	7	0-43	0.376
Pharmacotherapy	2 (4)	0-1	0	0-26	1 (3)	0-1	0	0-18	0.363
Crisis contacts	0 (0)	0-0	0	0-18	0 (0)	0-0	0	0-31	0.987
<i>At 12 months assessments (T⁴)</i>									
Number of sessions Primary Treatment ¹	13 (21)	3-17	8	0-177	12 (13)	1-16	9	0-63	0.466
Cognitive Behavioural Therapy	11 (18)	1-12	7	0-145	10 (12)	0-14	8	0-63	0.617
Pharmacotherapy	2 (5)	0-1	0	0-26	1 (3)	0-1	0	0-18	0.372
Crisis contacts	0 (3)	0-0	0	0-18	0 (2)	0-0	0	0-31	0.987

Note: Number of sessions are presented as mean (±standard deviation [SD]), interquartile range (IQR), median, range).

¹Total number of Face to Face, No Show, Telephone and/or email contacts primary treatment.