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Original Study

Cost-Effectiveness of an Online Intervention for Caregivers of People Living With Dementia

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A B S T R A C T

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Objectives: Little evidence exists on costs or cost-effectiveness of online interventions for caregivers of people living with dementia. We aimed to assess cost-effectiveness of online cognitive behavioral therapy (CBT) for dementia caregivers with mild-to-moderate depression/anxiety, with or without telephone support, relative to a psychoeducational control treatment.

Design: Cost-effectiveness study of data from 3-armed randomized controlled trial comparing computerized CBT (cCBT) or telephone-supported cCBT (cCBT+Telephone) to modular online educational program on dementia (Psychoeducation).

Setting and Participants: UK-resident adult dementia caregivers with mild-to-moderate anxiety/depression. **Cost-effectiveness analysis:** We calculated health and social care costs, from participant-reported data collected at baseline, 12, 26 weeks, costs of intervention delivery. We examined 3 outcomes: cost of one-point reduction in General Health Questionnaire–12 (GHQ-12) rating at 26-weeks, cost of prevented “caseness” on GHQ-12 at 26 weeks, and cost per quality-adjusted life year (QALY) based on Short Form–6 Dimensions (SF-6D) over 26 weeks.

Results: Data from 176 participants (44 cCBT, 91 cCBT+Telephone, 41 Psychoeducation) were analyzed. Costs did not differ between cCBT and Psychoeducation; costs were £125 higher in cCBT+Telephone. Control and intervention groups did not differ on GHQ-12. Caseness was lower in cCBT+Telephone than Psychoeducation; cost of preventing a case was £610, and probability of cost-effectiveness on this outcome reached 98.5% at willingness to pay (WTP) of £12,900. Mean QALY did not differ between cCBT+Telephone and Psychoeducation. QALY gain in cCBT was 0.01 (95% CI 0.001, 0.021). Cost per QALY was £8130. Although base case probability of cost-effectiveness of cCBT was 93% at WTP-per-QALY of £27,600, sensitivity analyses suggested cCBT+Telephone was the more cost-effective.

Conclusions and Implications: We report preliminary evidence for adopting telephone-supported online CBT. This may be cost-effective in preventing a case of mental health disorder if, absent a societally accepted WTP threshold for this outcome, payers are willing to pay £12,900. Future research should investigate whether supported/unsupported online CBT improves health-related quality of life.

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Family and friends play vital roles in supporting people living with dementia. In many cases, these caregivers provide the bulk of support services for people with dementia and bear the costs of doing so. Dementia is a high-cost condition, costing £26.7 billion in England and £624 billion¹ globally.^{1–3} Unpaid care is associated with negative health outcomes, both physical and psychological.⁴ For example, many caregivers of people living with dementia experience poor psychological outcomes such as depression, anxiety, and burden.⁵ Poor mental health can lead to increased use of health and support services by caregivers.^{6–9} It is morally, socially, and economically important to find ways to help caregivers to maintain good mental health.

Approaches to improve caregivers' psychological outcomes include provision of information about the condition,¹⁰ psychoeducation offering both educational and psychological or psychotherapeutic elements,^{5,11} and cognitive behavioral therapy (CBT).¹² Interventions may offer a single approach or a combination. Web-based versions of these interventions offer the prospect of a low-cost scalable means of reaching caregivers.

There is some evidence that online interventions can work to improve well-being and psychological outcomes of caregivers of people living with dementia. Coupled with either professionally guided or self-guided psychological support, they can be effective in decreasing symptoms of depression and anxiety.^{13,14} Online interventions that are customized for individual users may have a greater impact on outcomes than interventions that are not personalized.¹⁴ There is mixed evidence that technology-based CBT interventions without professional support could be effective over short periods in reducing depression in caregivers of people living with dementia.^{12,15} However, evidence is lacking on the *costs* or *cost-effectiveness* of online interventions for caregivers of people living with dementia.¹⁵

We conducted an economic evaluation to assess the costs and cost-effectiveness of online interventions, comparing online CBT (1) without telephone support (unsupported CBT, or cCBT) and (2) with telephone support (supported CBT or cCBT+Telephone) relative to the control treatment (Psychoeducation).

Methods

Design

Caring for Me and You (CFMAY) was a 3-armed randomized controlled trial for caregivers with mild to moderate depression or anxiety caring for people living with dementia. The trial compared online CBT with or without telephone support with a psychoeducational standard care treatment.¹⁵ Supported or unsupported CBT was hypothesized to significantly improve caregiver mental health relative to Psychoeducation, using the General Health Questionnaire–12 (GHQ-12)¹⁶ as the primary outcome measure. The economic evaluation was a cost-effectiveness analysis that took a health and social care payer perspective.

The study had English Health Research Authority ethical approval (13/SC/0117).

Sample

Eligible participants were people self-identifying as carers, aged 18 years and older, UK resident, and scoring between 5 and 15 on the Patient Health Questionnaire¹⁷ (PHQ-9) and/or scoring between 5 and 15 on the Generalized Anxiety Disorders Assessment (GAD7),¹⁸ indicating mild to moderate anxiety or depression.¹⁹ Stratifiers were used to balance allocation of participants across treatment groups (age groups: 18–40, 41–70, and ≥ 71 years; sex; depression severity based on PHQ-9: no, mild, and moderate).

Intervention

All participants had access to the CFMAY website. Depending on allocation, participants in the trial followed a modular online educational program on dementia (Psychoeducation), a 20-session course of online CBT (cCBT), or a 20-session course of CBT with telephone support (cCBT+Telephone). Participants self-completed research questions at baseline, 12, and 26 weeks by logging onto a secure website. Full details of trial methods are described elsewhere.^{15,20}

Resource Use and Costs

Resource use data were collected through the online platform alongside other measures, covering caregivers' prior 3 months' use of outpatient and inpatient hospital services, general practitioner contacts, primary care and community nurses, home care visits, and support from information/advice services. Costs were calculated by attaching a unit cost from nationally representative sources^{21,22} to units of service use (eg, hospital days) (Supplementary Table 1). We also calculated the unit costs of the interventions (Supplementary Table 1). The cost of a call, inclusive of psychology graduate telephone support and psychologist supervision, was £16.23 and the cost per hour, £35.70. Unit costs of setup calls and support calls (£8.93 and £17.85 respectively) were attached to numbers of setup and support calls received by individual participants across 26 weeks of follow-up. Web support costs of enrolled users were £33.97 and £4.23 per user, including and excluding development costs, respectively. Base year for prices was 2015–2016. Discounting of costs or outcomes was not needed as trial duration was not greater than 1 year.

Outcomes

The cost-effectiveness analysis examined 3 outcomes:

1. Cost of a 1-point reduction in GHQ-12 rating¹⁶ at 26-week follow-up
2. Cost of prevented "caseness" on the GHQ-12 at 26-week follow-up
3. Cost per QALY [Short Form–6 Dimensions (SF-6D)] over 26 weeks of follow-up

GHQ-12 measures mental distress²³ and scores range from 1 to 36; higher scores indicate worse mental distress. Scoring was reversed for cost-effectiveness analysis for ease of presentation. A binary variable for caseness (ie, a "case" of mental health disorder) on GHQ-12 was calculated using a threshold of 11 of 12 (scores from 0 to 11 coded as 0; scores from 12 to 36 coded as 1).²⁴ A binary variable for noncaseness (0 = case, 1 = noncase) was calculated as a measure of cases prevented.

SF-6D is a generic preference-based measure of health, consisting of 6 dimensions (physical functioning, role limitations, social functioning, pain, mental health, and vitality). Study participants reported their level of health in each of the 6 dimensions. SF-6D index scores (utilities) were derived from the 6 SF-6D items using preference weights based on health state valuations by a general UK population.²⁵ Preference weights applied to calculate SF-6D index scores are those derived from SF-36.²⁶ QALYs were calculated from SF-6D index scores as the area under the curve, assuming linear change in scores between follow-up points.²⁷

Cost-Effectiveness

We calculated incremental cost-effectiveness ratios (ICERs) for each comparison (cCBT vs Psychoeducation; cCBT+Telephone vs Psychoeducation). The ICER represents the difference in mean costs between intervention and control groups divided by the difference in

mean effects between these groups. We calculated incremental net monetary benefit (INMB) by monetizing the outcome produced by the intervention (multiplying a hypothetical societal decision maker's willingness to pay [WTP] for achieving the outcome by the between-group difference in effect) and deducting the between-group difference in costs. A positive INMB indicates that for a given WTP, benefit associated with the intervention exceeds the associated costs.²⁸ In exploring the cost-effectiveness of the interventions, we have included the WTP threshold set by the National Institute for Health and Care Excellence (NICE). NICE takes both clinical and cost-effectiveness evidence into account when making appraisals of new technologies. NICE has set a threshold for recommending adoption of health technologies in the English National Health Service within a range of between £20,000 and £30,000 per QALY.^{29,30}

Statistical Analyses

Outcomes, resource use, and component costs of participants with data available at each assessment point ("available data") were described. Continuous outcomes were summarized in terms of means (standard errors), and intervention groups compared to the Psychoeducation group in *t* tests; categorical outcomes were summarized as numbers and percentages and compared in chi-squared tests. Significance level was set at 5%. Total 26-week costs and outcome scores were summarized from data available at baseline and 26-week follow-up ("complete data").

Cost-effectiveness analyses were conducted on complete case data (hereafter "complete data").³¹ Seemingly unrelated regressions (SURs)³² of costs and outcomes were combined with nonparametric bootstrap sampling over 70,000 replications, stratified by group allocation. Regressions included treatment allocation, baseline scores of the dependent variable (utility, GHQ scores, caseness, costs), and stratifying variables (participants in the youngest age group numbering fewer than 5 in the sample for analysis, the youngest and middle age groups were combined to create a binary age variable for 18–70 and ≥71 years).

Between-group differences were presented in terms of regression estimates and bias-corrected bootstrap 95% CIs (hereafter referred to as "CIs"). Marginal group means of outcomes and costs were derived from SUR models. Estimated between-group differences in costs and outcomes from each replication were used to calculate INMB over a range of willingness-to-pay values (£0–£30,000) and to plot the probability of this benefit being greater than zero over this range. The resultant cost-effectiveness acceptability curve (CEAC) allows decision makers to explore the likelihood that the interventions are cost-effective, in light of decision and sampling uncertainty.^{28,33} All analyses were conducted in Stata, release 16 (StataCorp).

Missing Data

The cost calculations required a complete set of cost items, so that any missing data in the component cost variables resulted in a missing total cost score at each point. If the 12-week total cost score was missing, this also resulted in a missing score for total costs over the full 26-week follow-up period.

Sensitivity Analyses

We conducted 2 sensitivity analyses (see further details in the [Supplementary Material 1](#)). Extreme high-cost outliers were excluded from the analysis sample to examine their impact on group costs and cost-effectiveness. Multiply imputed data were analyzed to examine robustness of results to the assumption underlying the complete cases analyses that data were missing completely at random.³⁴

Results

At baseline, 638 caregivers participated ([Supplementary Figure 1](#)). Substantial numbers did not complete follow-up assessments (414 or 65% of the sample at week 12; 430 or 67% at week 26). Where participants had completed online questionnaires at 12-week and 26-week follow-ups, the cost data were almost complete, with under 3% at baseline and under 2% missing at the follow-ups. Data sufficient to calculate costs over the whole follow-up period were available for 176 cases.

Sample Characteristics and Service Use

Most caregivers completing baseline measures were aged <71 years, female, and had depression of mild to moderate severity on the PHQ-9 ([Supplementary Table 2](#)). In the sample of 176 participants available for cost-effectiveness analyses, although the groups were not quite as well balanced on these factors, they did not differ on chi-squared tests in terms of sex, age, or depression severity.

At baseline, proportions visiting a GP surgery at least once over the prior 3 months ranged from 52% in the Psychoeducation group to 50% and 57% in cCBT and cCBT+Telephone groups respectively ([Supplementary Table 3](#)). More than a third of caregivers sought some form of information or advice. Service use patterns at follow-up were broadly similar to baseline. Participants in the cCBT+Telephone group received 919 calls (167 setup and 752 support calls) over the trial period, taking 417.75 hours.

Costs

Mean total health and social care costs over the prior 3 months were modest, ranging from £167 to £306 at baseline and £159 to £260 at 26-week follow-up ([Supplementary Table 4](#)). Hospital and primary/community health care costs accounted for at least 85% of overall costs in all arms at each follow-up. Three-month total costs were comparable between intervention and control groups at every time point. Intervention costs were the same in the cCBT and Psychoeducation groups, but significantly greater in the cCBT+Telephone than the Psychoeducation group (by £115, 95% CI 100, 130). Including the costs of web development in the unit cost of the web support component of the intervention, mean total cost per group increased only modestly, by £30.

Outcomes

Outcome scores from all available participants did not differ between intervention and control groups in terms of mean GHQ-12 or SF-6D scores at either follow-up ([Supplementary Table 5](#)). Numbers with caseness for mental health in the available participants ([Supplementary Table 6](#)) were similar between Psychoeducation and cCBT. Comparing Psychoeducation and cCBT+Telephone, there was a trend in the cCBT+Telephone group for lower numbers with caseness.

Costs and Outcomes of Complete Data for Analysis

Intervention and control groups were broadly similar at baseline and follow-up in terms of total costs and GHQ-12 scores ([Table 1](#)). Total 26-week costs were £358 in the Psychoeducation, £458 in the cCBT, and £468 in the cCBT+Telephone group. Utilities (SF-6D index scores) did not differ between intervention and control groups at baseline; utilities and QALY gain did not differ between intervention and control groups at follow-up. Mean noncaseness (proportion rated as not having mental health disorder) was higher in the cCBT+Telephone than in the Psychoeducation group at follow-up.

Table 1
Outcomes and Costs (£, 2015–2016), Baseline and 26-Week Follow-Up, Complete Data (N = 176)

Item	Group Means (SE)			Mean Difference From Control and 95% CI					
	cCBT, Mean (SE)	cCBT+Tel., Mean (SE)	Psychoeducation, Mean (SE)	cCBT-Psychoeducation			cCBT+Tel.-Psychoeducation		
				Mean	95% CI	P	Mean	95% CI	P
Baseline	n = 44	n = 91	n = 41						
HSC cost*	238 (61)	186 (27)	216 (66)	22	–158, 201	.81	–30	–149, 89	.62
GHQ-12	16.045 (0.598)	15.769 (0.407)	16.195 (0.572)	–0.15	–1.800, 1.500	.86	–0.426	–1.845, 0.993	.55
Noncase [†]	0.205 (0.062)	0.143 (0.037)	0.122 (0.052)	0.083	–0.078, 0.244	.31	0.021	–0.108, 0.150	.75
Utilities	0.493 (0.013)	0.513 (0.009)	0.520 (0.019)	–0.027	–0.071, 0.017	.22	–0.007	–0.043, 0.029	.70
Follow-up	n = 44	n = 91	n = 41						
Intervention cost [‡]	4 (0)	119 (5)	4 (0)	0	–	–	115	100, 130	<.001
HSC cost [‡]	454 (83)	349 (42)	354 (49)	100	–95, 296	.31	–5	–145, 136	.95
HSC + intervention cost [‡]	458 (83)	468 (43)	358 (49)	100	–95, 296	.31	110	–34, 253	.13
Utilities	0.518 (0.017)	0.488 (0.011)	0.500 (0.015)	0.017	–0.028, 0.063	.45	–0.012	–0.050, 0.027	.54
QALY	0.249 (0.007)	0.249 (0.005)	0.249 (0.007)	0	–0.019, 0.020	.96	0	–0.016, 0.017	.97
GHQ-12	13.273 (0.844)	10.813 (0.567)	0.122 (0.052)	1.078	–1.213, 3.369	.35	–1.382	–3.346, 0.582	.17
Noncase [†]	0.432 (0.076)	0.626 (0.051)	0.415 (0.078)	0.017	–0.199, 0.233	.88	0.212	0.029, 0.394	.023

HSC, health and social care.

*Costs over the prior 3 months.

[†]Noncaseness for depression measured by GHQ-12, where GHQ-12 score ≥ 12 is coded as 0 and GHQ-12 score < 12 is coded as 1. Noncaseness is treated as continuous.[‡]Costs over 26-week follow-up. Intervention cost excludes website development costs.

Cost-Effectiveness Analyses

GHQ-12

On the GHQ-12 (Table 2), controlling for stratifiers, outcome in the cCBT group was somewhat but not significantly worse (ie, more mental distress) than in the Psychoeducation group, and cost was not significantly higher (CIs crossed zero). The cost per 1-point decrease on GHQ-12 (the ICER) for cCBT vs Psychoeducation (–£80) represents the cost of a slightly worse outcome in the cCBT group (Table 2). The outcome in the cCBT+Telephone group was somewhat better (lower mental distress) but CIs of the outcome difference crossed zero; costs were higher than those in the Psychoeducation group. The ICER for the cCBT+Telephone group of £100 represents the cost of a slightly better outcome in the cCBT+Telephone group.

No CEAC is shown for cCBT vs Psychoeducation as the former had a somewhat worse outcome (greater mental distress) than for the Psychoeducation group (although CIs crossed zero). Probability of cCBT+Telephone support being cost-effective on GHQ-12 is illustrated by the CEAC (Figure 1). Probability of cost-effectiveness was 91% at all WTP values between £4200 and £30,000. cCBT+Telephone support could be considered cost-effective if the decision maker was willing to

accept less than 95% certainty at a given WTP (eg, they could be 80% confident that this intervention was cost-effective at WTP of £2200).

Caseness on the GHQ-12

The cCBT group had somewhat higher caseness and higher costs (CIs of both outcome and cost differences crossing zero; Table 2). The cost of preventing a case on GHQ-12 with cCBT+Telephone support vs Psychoeducation was £610. There was a reduction in caseness (ie, no longer having a mental health condition) and an increase of £125 in the cCBT+Telephone group (the CIs of cost and outcome differences did not include zero).

The CEAC (Figure 2) for cCBT+Telephone shows that the probability of cost-effectiveness in terms of preventing a case reached 98.5% at £12,900. A decision maker willing to pay at least this amount would have a high level of confidence of cost-effectiveness of cCBT+Telephone. As the outcome in the cCBT group was worse than in the Psychoeducation group, no CEAC is shown.

QALY gain

The cCBT group had a QALY gain of 0.01 (95% CI 0.001, 0.021), costs were somewhat higher than Psychoeducation and the ICER

Table 2
Cost-Effectiveness Analyses: Costs (£, 2015–2016) and Outcomes at 26 Weeks, Complete Data (N = 176)

Item	Group Means* (95% CI) [†]			Adjusted Estimates Mean Difference From Control (95% CI) [‡]			
	cCBT (n = 44)	cCBT+Tel. (n = 91)	Psychoeducation (n = 41)	cCBT vs Psychoeducation		cCBT +Tel. vs Psychoeducation	
				Difference	ICER	Difference	ICER [‡]
Costs [§]	439 (337, 581)	479 (404, 567)	354 (254, 456)	85 (–49, 267)	–80	125 (12, 262)	100
GHQ-12**	13.243 (11.7, 14.864)	10.866 (9.792, 12.019)	12.109 (10.69, 13.623)	1.134 (–1.034, 3.306)		–1.243 (–3.051, 0.61)	
Costs [§]	439 (337, 580)	479 (404, 567)	354 (254, 456)	85 (–49, 267)	–7660	125 (12, 263)	610
Noncaseness ^{††}	0.415 (0.279, 0.559)	0.63 (0.528, 0.727)	0.426 (0.286, 0.577)	–0.011 (–0.211, 0.187)		0.204 (0.02, 0.372)	
Costs [§]	440 (337, 581)	479 (404, 567)	354 (255, 456)	85 (–48, 268)	8130	125 (12, 262)	39680
QALY ^{‡‡}	0.256 (0.246, 0.265)	0.248 (0.24, 0.256)	0.245 (0.237, 0.253)	0.01 (0.001, 0.021)		0.003 (–0.006, 0.012)	

*Estimated marginal means, bootstrap bias–corrected CIs. Cost–outcome estimates rounded to whole numbers or 3 decimal places.

[†]Observed mean difference and bootstrap bias–corrected 95% CIs of the difference.[‡]ICER estimates rounded to nearest 10.[§]Estimates from SUR equation for costs adjusted for stratifiers (age group, sex, depression on PHQ-9 categorized as no, mild and moderate), baseline costs.^{||}ICER: GHQ-12 scores were reversed so that an increase represented an improvement, and the ICER represents the cost of a 1-point increase.

**GHQ-12 from the SUR equations has been transformed to the original scale, so that an increase represents a poorer outcome. Estimates from SUR equation for GHQ-12 adjusted for stratifiers (age group, sex, depression on PHQ-9 categorized as no, mild, and moderate), baseline GHQ-12.

^{††}Noncaseness for depression measured by GHQ-12, where GHQ-12 score ≥ 12 is coded as 0 and GHQ-12 < 12 is coded as 1. Noncaseness is treated as continuous. Estimates from SUR equation for noncaseness at 26-week follow-up adjusted for stratifiers (age group, sex, depression on PHQ-9 categorized as no, mild, and moderate), baseline noncaseness.^{‡‡}Estimates from SUR equation for QALY adjusted for stratifiers (age group, sex, depression on PHQ-9 categorized as no, mild, and moderate), baseline utility.

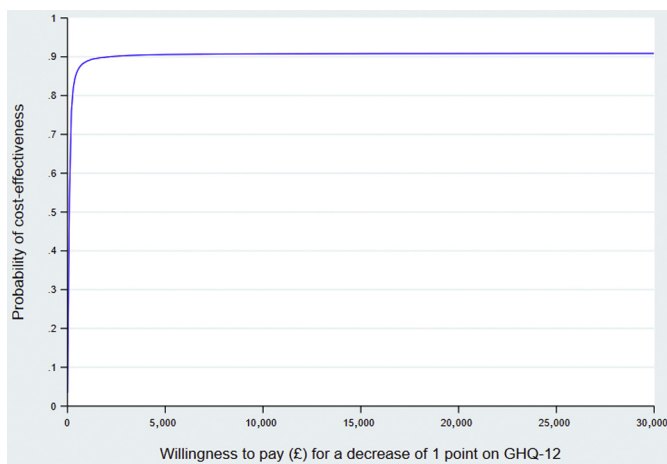


Fig. 1. Cost-effectiveness acceptability curve, GHQ-12: cCBT+Telephone vs Psychoeducation.

was £8130 (Table 2). The cCBT+Telephone intervention produced 0.003 more QALY than Psychoeducation, with cost per QALY of £39,680, considerably above the NICE threshold range.²⁹ cCBT achieved a higher QALY gain and a lower ICER than did cCBT+Telephone.

Probability of cost-effectiveness of cCBT reached 88% at a WTP of £20,000 and 93% at £27,600. A decision maker could not be highly certain of the cost-effectiveness of cCBT at WTP values within the NICE threshold range. If the decision maker was willing to accept a lower than 95% level of certainty, they could, for instance, be 70% confident that cCBT was cost-effective at a WTP of £23,000. Probability of cost-effectiveness of cCBT+Telephone in terms of QALY gain was 44% at a WTP of £30,000 (Figure 3).

Sensitivity Analyses

Results are presented in full in the [Supplementary Material 1](#) and the findings summarized here.

Outliers

Results of analyses excluding outliers were broadly similar to the base case.

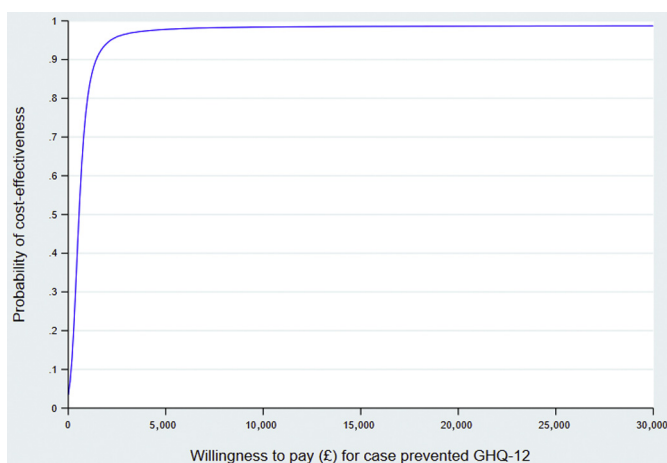


Fig. 2. Cost-effectiveness acceptability curve, caseness on GHQ-12: cCBT+Telephone vs Psychoeducation.

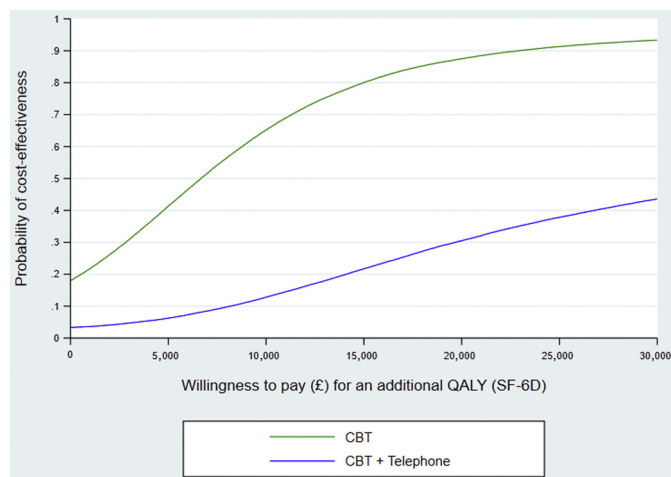


Fig. 3. Cost-effectiveness acceptability curves, QALY (SF-6D): cCBT+Telephone vs Psychoeducation and cCBT vs Psychoeducation.

Multiply imputed data

Results of some analyses were at odds with those of the base case. cCBT was more costly than Psychoeducation (CIs of the difference did not cross zero), whereas cCBT+Telephone was not significantly more costly (CIs of the difference crossed zero). cCBT+Telephone produced a larger QALY gain relative to Psychoeducation than did cCBT. The cost per QALY of cCBT+Telephone (£5410) was much lower than that of cCBT (£84,050). Probability of cCBT+Telephone being cost-effective was above 97.5% at a WTP of £19,500 (whereas the probability of cCBT being cost-effective was between 4% and 15% at WTP of £20,000 and £30,000, respectively).

Discussion

We examined the impact of online CBT, with and without telephone support, on mental health, quality of life, service use, and costs of caregivers of people living with dementia. Health and social care costs were modest; health care services accounted for the greatest part. Direct costs of both online Psychoeducation and cCBT interventions were low, whereas direct costs of providing telephone support were greater, as expected. However, total costs of the cCBT+Telephone support group were similar to those in the other groups.

Cost-effectiveness analyses suggested that cCBT+Telephone support could be cost-effective in preventing caseness on GHQ-12. In the absence of a societally accepted willingness-to-pay threshold for preventing a case of mental health disorder, payers would need to decide whether they are willing to pay £12,900 to prevent a case (with high levels of confidence in this estimate). Analyses of SF-6D-derived QALY suggested that cCBT vs Psychoeducation could be cost-effective. However, neither cCBT nor cCBT+Telephone support would be considered cost-effective with high levels of confidence within the £20,000–£30,000 per QALY range of willingness-to-pay thresholds associated with NICE recommendations.

It is important to consider these results in conjunction with those from the clinical effectiveness study. Fossey et al.¹⁵ found that online CBT with telephone support and online Psychoeducation produced similar outcomes in terms of caregivers' mood and mental health. However, mood, depression, and stress were worse for online CBT without telephone support than Psychoeducation participants. We note some limitations to the analyses. Attrition was considerable and unequal between groups: the number of cases available for economic analysis was approximately a third of the target sample size in the

cCBT and Psychoeducation groups and approximately three-quarters of the target in the cCBT+Telephone support group. Results of sensitivity analysis with multiply imputed data contradicted the results of the base case on QALY, suggesting that CBT with telephone support was the more cost-effective option. Generalizing the results of the SF-6D-QALY analyses is not straightforward because study participants were asked to rate dimensions directly rather than to complete the SF-12 or SF-36, from which the SF-6D is usually derived.³⁵ Nonetheless, these findings contribute to the currently scant evidence base on costs and cost-effectiveness of online interventions for caregivers of people living with dementia.

Family caregivers of people living with dementia carry substantial burdens, in terms of unpaid care time and lost employment,^{3,9} and poor mental health.⁴ This study did not address whether online support of the kind offered in CFMAY had economic impacts from the societal perspective, that is, including the economic consequences of these impacts, nor did it address the health and care costs of the cared-for person with dementia. These questions could be addressed in future economic evaluations of online interventions to support dementia caregivers.

Conclusion and Implications

Our evaluation offers some preliminary economic evidence for adopting telephone-supported online CBT to reduce caseness by providing mental health support to dementia caregivers who have mild to moderate depression or anxiety. In light of the evidence from this study and the clinical evaluation,¹⁵ CBT with telephone support or online psychoeducation should be offered in preference to online CBT without telephone support. Further work is needed to assess whether online CBT with or without telephone support improves health-related quality of life. Future studies should include an economic evaluation to inform decisions about online interventions for supporting caregivers in the face of limited resources but growing dementia prevalence.

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