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Online supplement DS2

Unit costs applied in the economic evaluation

All unit costs applied to each resource item were for the financial year 2009–2010. National Health Service (NHS) hospital contacts were costed using NHS reference costs.[37] Unit costs of community health and social services were taken from national publications[38] and medications were costed using the *British National Formulary*.[39] Where necessary, costs were inflated to 2009–2010 costs using the Hospital and Community Health Services inflation indices or the Retail Price inflation indices as appropriate.[38]

The cost of the joint crisis plan (JCP) intervention was directly calculated using a micro-costing approach[40] and was based on the expected salary of JCP facilitators in clinical practice (mid-point of NHS Agenda for Change grade 5/6) plus the cost of the care coordinator. Salary costs included employer costs (national insurance and superannuation contributions) and relevant overhead costs (administrative, managerial and capital).[38] Calculation of indirect (non-face-to-face) time, including preparation, training, supervision, etc., was based on information recorded by the trial facilitator on the ratio of time spent in direct face-to-face contact to time spent on other intervention-related activities. This ratio was used to generate a cost per min of face-to-face contact with the study facilitator and care coordinator, which was then applied to a typical JCP planning process, as described in the main paper. The JCP cost reported is an average cost for a typical JCP intervention, based on facilitator report of the standard number and length of contacts required to produce a JCP. Data on duration of contacts was not available at the level of the individual participant, so individual-level costs could not be calculated. This approach was considered reasonable given the standardised nature of the JCP intervention, as described in the main paper.

Cost-effectiveness analysis

For this feasibility study, cost-effectiveness was primarily explored descriptively, taking a cost–consequences approach, as described and reported in the main paper. A formal cost-effectiveness analysis was also carried out, as detailed in our original protocol,[9] but given the small sample sizes involved, this was considered hypothesis-generating only and is reported here for information and transparency.

Method

Cost-effectiveness was explored in a cost-utility analysis using quality-adjusted life years (QALYs) as the measure of effect, derived from the EQ-5D.[21] The EQ-5D health states were assigned a utility score using responses from a representative sample of adults in the UK.[41] The QALYs were then calculated as the area under the curve defined by the utility values at baseline and 6-month follow-up and it was assumed that changes in utility score over time followed a linear path.[42] Uncertainty around the costs and effectiveness estimates was represented by cost-effectiveness acceptability curves (CEACs), which were calculated using the net benefit approach.[43] Non-parametric bootstrapping from the cost and effectiveness data, adjusted for baseline cost, alcohol use and depression, was used to generate a joint distribution of incremental mean costs and effects for the two randomised groups to explore the probability that each is the optimal choice, subject to a range of maximum values (ceiling ratio) that a decision maker might be willing to pay for an additional QALY. The CEACs were generated by plotting these probabilities for a range of values of the ceiling ratio.[44]

Results

Mean costs per participant over the 6-month follow-up period are reported in Table 4 in the main paper and were found to be similar between the two groups (mean cost £5308 JCP + treatment as usual (TAU) *v.* £5631 TAU). Mean EQ-5D tariffs at baseline and follow-up were also similar between the two groups and changed little over time, resulting in QALYs over the follow-up period of 0.31 (s.d. = 0.11) in the JCP + TAU group and 0.30 (s.d. = 0.15) in the TAU group (Table DS1). The incremental cost-effectiveness ratio was −£32 358 (cost of JCP + TAU group minus cost of TAU group divided by effect of the JCP + TAU group minus effect of TAU group; £5308 − £5631/0.31 − 0.30), demonstrating that the combined JCP + TAU intervention strongly dominates TAU, being both less costly and more effective.

A scatter plot of bootstrapped mean differences in costs and QALYs between randomised groups is presented in Fig. DS1. Bootstrapping is a method that provides estimates of the sampling distribution of a hypothetical larger data-set. In Fig. DS1, each replication point on the scatter plot represents a bootstrapped cost and effectiveness pair that illustrates the difference in mean cost and the difference in mean effects between a JCP + TAU participant and a TAU participant (all differences are JCP + TAU minus TAU). A majority of the replications fall in the south-east quadrant of the graph, indicating that JCP + TAU is less costly and more effective than TAU alone. Figure DS2 presents the CEAC for JCP + TAU compared with TAU alone. This curve indicates the probability that JCP + TAU is more cost-effective than TAU for different values a decision maker (such as the NHS) might be willing to pay for QALY gains. The CEAC suggests that there is over an 80% probability that JCP + TAU is more cost-effective than TAU alone.

Discussion

The results of this economic evaluation suggest there is a greater probability of JCP + TAU being the more cost-effective option,

Table DS1 Quality-of-life outcomes at baseline and follow-up[a]

Quality of life	Treatment as usual	Joint crisis plans + treatment as usual
EuroQol Visual analogue scale		
Baseline		
n	42	46
Mean (s.d.)	45.17 (17.46)	45.11 (17.21)
Month 6		
n	36	37
Mean (s.d.)	53.06 (21.71)	46.95 (19.02)
EuroQol EQ-5D scores		
Baseline		
n	41	46
Mean (s.d.)	0.555 (0.376)	0.632 (0.269)
Month 6		
n	36	37
Mean (s.d.)	0.603 (0.333)	0.582 (0.330)
EuroQol EQ-5D QALYs over follow-up		
n	35	37
Mean (s.d.)	0.299 (0.154)	0.307 (0.112)

a. Area under curve calculations were used to estimate quality-adjusted life years (QALYs). An individual with perfect health would have an EQ-5D score of 1 – this would translate to a QALY estimate of 0.5 QALYs over the 6-month follow-up.
No significant differences ($P < 0.05$) were found between treatment as usual and joint crisis plans + treatment as usual.

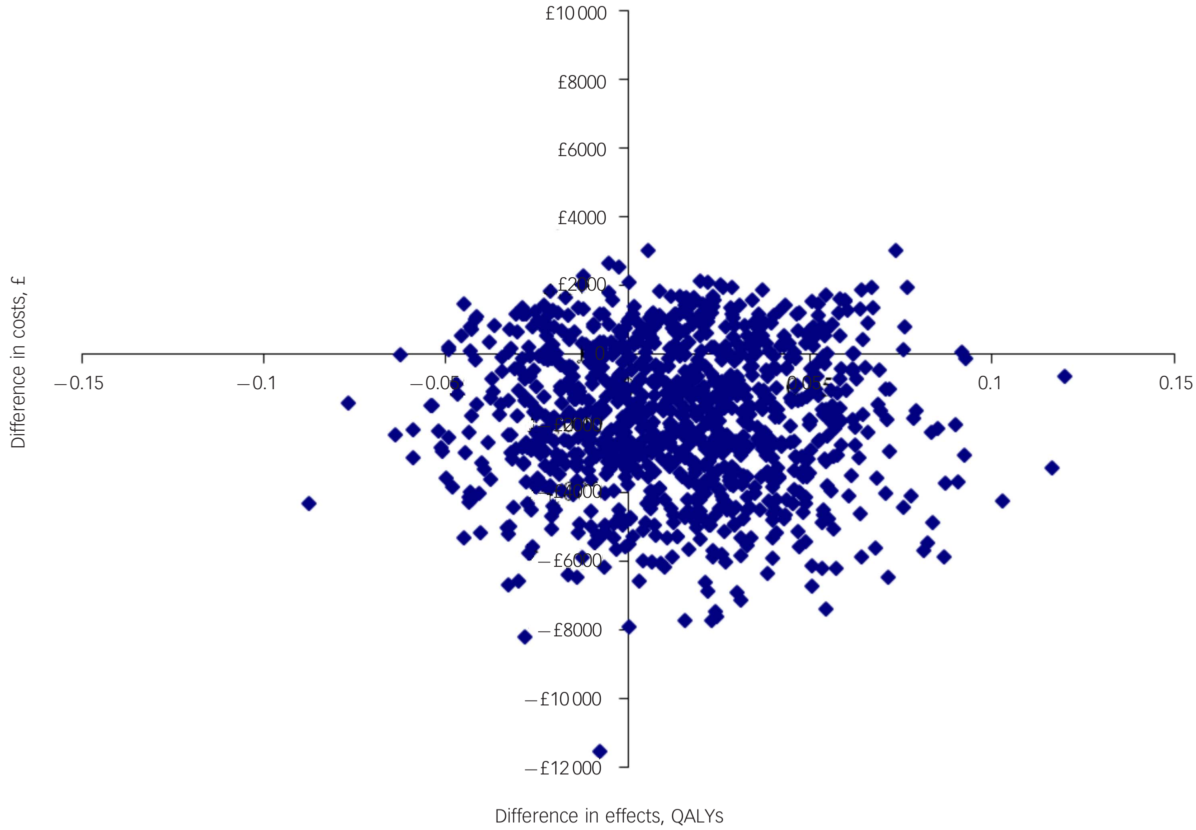

Fig. DS1 Scatter plot of bootstrap replications used to create cost-effectiveness acceptability curve.

QALYs, quality-adjusted life years.

despite only small and non-significant differences between the two groups in terms of both costs and effects.

From a decision-making point of view, the perversity of ruling out an intervention that has the highest probability of being cost-effective has been highlighted as a limitation of conventional hypothesis testing.[45,46] Although observed differences may indeed be the result of chance, a decision still has to be made and the recommended approach is to use the available evidence rather than to dismiss it on the basis of an arbitrary decision rule. It should then be left to the decision maker to assess the quality of the available evidence and decide whether or not there is a need for further information. In the meantime, it is argued that the decision maker would do better to select the intervention with the highest probability of being cost-effective, in this case JCP + TAU, than to simply maintain the status quo.

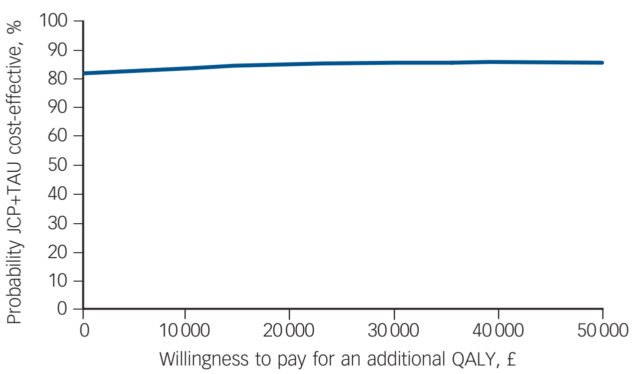

Fig. DS2 Cost-effectiveness acceptability curve for joint crisis plans + treatment as usual (JCP + TAU) over 6 months follow-up.

QALY, quality-adjusted life year.

Given the exploratory nature of this trial, however, the small sample sizes involved, the lack of significant improvements in the primary outcome measure and the large confidence intervals for costs, a decision to fund JCPs in addition to TAU may be premature.

Additional references

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