Reviewer's report

Title: An Economic Evaluation of an Augmented Cognitive Behavioural Intervention vs. Computerized Cognitive Training for Post-stroke Depressive Symptoms

Version: 2
Date: 29 June 2015

Reviewer: Braden Teao Te Ao

Reviewer's report:

Thank you for the opportunity to review the manuscript considered for publication with BMC Neurology. This a reasonably well presented study and it is good to see that the authors have adhered to the CHEER reporting guidelines. I read this manuscript with great interest. The authors concluded that the cost effectiveness results for CBT in comparison to CogniPlus were not favourable, and would not seem like a good investment for healthcare providers. However, I have a number of questions and general comments for the authors to address.

Major compulsory revisions

Introduction
What's the current rate or percentage of post-stroke depressive symptoms and increased hospitalisation?

Line 100: What were some possible reasons for why the effectiveness of psychological interventions are limited? Is this (i.e., effectiveness) in reference to efficiency or efficacy? And also-is this a general statement or is it in relation to specifically to stroke?

Line 101: What are the previous successes (if any) have been demonstrated for stroke? What does CBT involve…..what is it? I would've thought that the efficacy for such interventions are known.

The authors need to provide a strong rationale for the intervention including current alternatives.

Line 102: Please give some examples of the other chronic conditions. I understand these techniques are currently used in addiction, the question is whether if there's a place for CBT to play in applied neuroscience or stroke?

Methods
I noted that there was no mention in regards to the choice of model and assumptions underpinning the decision analytic model. Could the authors provide a figure of the model (including health states) and /or a description of the model assumptions?

One important aspect of economic evaluation is the ability to extrapolate resource use (cost) and health outcomes to estimate long-term cost and health outcomes. This is an added value in comparison to a clinical trial. Could the
authors comment on the justification for taking a short time horizon (i.e., 8 months post treatment) within the economic modelling? This should also be mentioned in the discussion as a limitation.

Line 242: The authors made note about “missing data” and how they dealt with this. Given that the results were based on a small sample size (i.e., N= 31 in CBT vs. N=30 in control). What was the proportion or percentage of missing data? Secondly did the imputation for missing data involve replacing with “weighted averages”? I struggle to understand how a set of plausible values could be generated with a relativity small sample size.

Line 250: How was cost effectiveness defined? Or more specifically, what was considered to be a successful ICER? This would be helpful for the general readership to understand your results and conclusion.

Line 277: Friction method needs more description. I noted the authors used a human capital approach (line 230) I presume productivity cost were calculated up to 65 years of age? If so- I would argue that a friction cost method should have been used within the base case analysis instead (Human capital (HC) in the sensitivity). Given that the average age of the study participant was around 60 years, what’s the likelihood of re-employment among this age group?- HC may have overestimated costs……Could the authors justify their approach?

Results

Line 294 Cost analysis
What are the possible reasons which might explain the difference in societal costs between groups? Is return to work rate higher in the CBT group? Although the authors touch on this in the discussion- I feel it should be placed earlier and discussed further in the discussions section.

Line 319 Cost effectiveness
Author could state the ICUR resulted in cost savings (i.e., €-160.390)? Rather than a “negative ICER”. This can me miss-interpreted as being a negitive outcome.

The results showed that they were more favourable when quality of life was considered when compared to the hospital anxiety and depression scale. Could the authors give more comment on the impact of the outcomes measured either here or the discussion section?

Line 335 Sensitivity analysis
Although the sensitivity results echo common and known trend, for instance lower costs depending on perspective and productivity cost methods. Should the HADS (rather than QALY) being tested also in the sensitivity analysis? But the authors should emphasise the conditions the study has identified in order for CBT to be cost effective-this would be more interesting.

Discussion

What are the “next steps” or recommendations for further ressearch?

Line 401-404 Why was cogniPlus choosen as the comparator? And care as
usual omitted from the analysis?

Line 407-415: The authors commented on recruitment difficulties yet the study recruited from multiple sites? Could the authors provide a direction for further research?

Line 418: With the number of missing values for HADs and EQ-5D-3L. Should a feasibility study be carried out to investigate whether data collecting methods is capable of obtaining these outcomes? Or something else?

Line 430-431 The author states that further research in a larger population is needed. Could they please provide more description here? Given that study collection was collected over multiple sites.

Minor essential revisions

Abstract

Line 44: Should it read higher healthcare costs? rather than substantial?

Line 76: What does the authors mean by this-(i.e., “did not show convincing”….)? has the authors considered defining what ICER constitutes as being “cost effective” within their study? Given that the ICER of €2,395 and an ICUR of €-160,390, as a reader I would’ve thought these results were convincing or quite positive.

Introduction

Line 90: It is better for the authors to provide specific numbers/costs to illustrate their point made. As it stands the statements introducing the burden of stroke (post-stroke depressive symptoms on cost of health and health care utilisation) are general comments.

I would recommend to use the word “higher” healthcare costs as opposed to “substantial” if not supported with appropriate reference.

Methods

Line 209: QoL should be written in full (I did not see this mentioned earlier-apologise if I missed this).

Line 211-228: Was the cost of implementation of CBT or CogniPlus included? As it stands one would immediately expect that CBT is less costly due to the number of sessions involved- is this correct?

Results

Line: 285-290 Sample

I wonder if a regression analysis would be helpful here to illustrate and systematic difference in sample characteristics between groups by demographic (i.e., age, sex, ethnicity, socio-economic status, severity, employment etc). Reported costs can be rounded up to the nearest dollar.

Discussion

Line 371 Not sure if “negative QALY” is the right term to use here.
Line 375 difference in effects—could the author provide 95% CI or range for the mean difference?

Tables and figure
Figure 3: CE acceptability curve, what are the possible reasons for the Linear progression? I was expecting to see a curve.

Discretionary revisions
None

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**
I declare that I have no competing interests