Author's response to reviews

Title: Development of a Computer Assisted Learning (CAL) package to raise awareness of autism

Authors:

Jariya Chuthapisith (kositprapa@hotmail.com)
Benedict Di Mambro (Ben.dimambro@nottingham.ac.uk)

Version: 2 Date: 8 November 2008

Author's response to reviews: see over
8 November 2008

Professor Melissa Norton  
Editor-in-chief  
*BMC Medical Education*

BioMed Central Ltd  
Science Navigation Group  
Middlesex House  
34-42 Cleveland Street  
London W1T 4LB  
United Kingdom

Dear Professor Norton,

I have attached the revised manuscript entitled, “Development of a Computer Assisted Learning (CAL) package to raise awareness of autism”. I have also included a detailed report of how we addressed each of the reviewer’s comments. We feel the suggestions made by the reviewers were very helpful in increasing the clarity and impact of the findings.

We hope that the changes we have made are acceptable. We look forward to hearing from you soon.

Yours sincerely,

Jariya Chuthapisith

Department of Pediatrics  
Faculty of Medicine Ramathibodi Hospital  
Mahidol University  
Bangkok 10400  
Thailand
Reviewer 1 (Tobias Bernd Weberschock)

1. Major finding is the significant difference in retention performance score which is between 0 and 24. Findings are perhaps reported in the paper in percentages since they report averages of 87.76 resp. 81.25. If these are percentages there might be left-skewed data for which tests which depend on normal distribution are not adequate. Authors should clarify reporting and statistics before publication. (MCR)

The data from both control and studied groups have a normal distribution. Therefore, it may be a fair comparison between an effect size based on normal distributions. We have particularly concerned about the small sample size and have addressed this in both Discussion section (page 9) and Conclusion section (page 11). However, the effect size in the study was quite large despite having only a small sample.

Page 9

However, due to relatively small numbers, caution needs to be taken in interpreting the results. In addition, randomization by a sequence of random numbers may result in selection bias and may lead to imbalance in groups.

Page 11

A study with appropriately powered sample size, validation of assessment tools, and pre-intervention knowledge measurement in the future may be able to confirm findings declared in the study.

2. Last sentence of introduction should reflect more precisely the research question posed (for example PICO scheme). (MER)

In order to clarify this issue, in the revised manuscript, we have rewritten the last sentence of Introduction section to emphasize the research question (page 4).

Page 4

This study has, therefore, developed a CAL package containing appropriate information about autism using “Xerte” and “Flash Macromedia” programmes. As
well, the effectiveness of the CAL package in providing essential information about autism was evaluated.

3. Generation of test set is described. Is there any work done to validate the questionnaire assessing the retention performance? What is with the internal consistency of the questions (e.g. Cronbach’s alpha)? (MER)

We agree with the reviewer that the questionnaire should be validated and should include checks on internal consistency. However, due to limitations of our resources, we did not validate the questionnaire. We have addressed this issue in the Discussion section on page 10 in the revised manuscript. This has been highlighted for the benefit of the reviewer.

Page 10
Firstly, there was no validity test of the questionnaire. Validation of the questionnaire would have increased the validity of the study.

4. Participant selection. Are the selected people representative for the people this intervention is intended to use for? (MER)

We intend to use the CAL package in persons who work with children. The CAL package used in this study contained general and essential knowledge about autism for persons who work with children. Therefore, child care students who participated in the study, in our opinion, were appropriate subjects.

5. Randomization was probably not adequately concealed and there is obvious imbalance in groups after randomization. Study size is very small which might also be a reason for imbalance (then by chance). (DR)

We have concerned about limitation of the study due to small sample size. Therefore, in the revised manuscript, we have addressed this issue in the Discussion section (page 9). Small sample size might have contributed to a decrease in power to detect between group differences. Also, the randomization by a sequence of random numbers may have selection bias. In the revised manuscript, we have, also, addressed this limitation on page 9.
However, due to relatively small numbers, caution needs to be taken in interpreting the results. In addition, randomization by a sequence of random numbers may result in selection bias and may lead to imbalance in groups.

6. Effect size could be referred to as Cohen’s d and perhaps explained what is meant by an effect size of 1. (DR)

We added the information regarding effect size as suggested by the reviewer. The new information was on page 9 and was highlighted for the benefit of the reviewer.

Although, the study found small difference in the retention performance between the control and the studied groups (p value=0.02), effect size was relatively high (an effect size of 0.2 is described as “small”, 0.5 as “medium” and 0.8 as “large” [34]).
Reviewer 2 (David William Wall)

1. There is a good section on the prevalence of autism. However it does not state what autism really is, or gives a description of the main features of the condition. I think this is a serious omission here.

We thank the reviewer for the comments above. We have added more information suggested by the reviewer. The new information was on page 3 and was highlighted for the benefit of the reviewer.

Page 3

Clinical features of autism consist of three main impairments, known as the “triad of impairment”: impairment in social interaction, impairment in communication and impairment in imagination. Recent research documented that prevalence for all autistic spectrum disorders (ASD) varied from 52 to 67 per 10,000, depending on geography and research methodology [1-4]. Although, there are many standard diagnostic instruments utilised to help to diagnose autism [5-7], the diagnosis of autism remains difficult, especially before the age of 3 [8]. Clinical manifestations are sometimes less obvious and not compatible with the diagnostic instruments. Consequently, the diagnosis of autism may be delayed and that may affect the outcome of children with autism. The early detection of autism is important; it can lead to early interventions which may well improve social and language development [9-15].

2. The paper is about the use of a computer assisted learning package on basic education in autism. How did the authors design the package? It does not really say here.

In order to clarify the above comment, we have added the information below in the Introduction section (page 4), as suggested by the reviewer. This has also been highlighted for the benefit of the reviewer.

Page 4

This study has, therefore, developed a CAL package containing appropriate information about autism using “Xerte” and “Flash Macromedia” programmes.
3. Some of the written English needs attention e.g. “the study was ethical approved” is one example of such a sentence.

The revised manuscript has been edited by a native English speaker.

4. The way the package was designed is stated here – but I think some of this should have been in the introduction. The sources of evidence here should have been referenced please.

We have added some details about the CAL package in the Introduction section (page 4), as suggested by the reviewer. Also, the sources of evidence have been referenced on page 5 in the revised manuscript.

Page 5
All information presented in the CAL package was adapted from the National Autism Plan for Children (NAPC) [25] and National Autistic Society (NAS), UK [26].

5. It needs to state here that this was a self-evaluation by candidates of the package. The level in the Kirkpatrick Hierarchy should be stated as well.

We thank the reviewer for the useful comments above. We have stated the Kirkpatrick Hierarchy model, as suggested by the reviewer, on page 10 in the revised manuscript.

Page 10
Lastly, the study evaluated only enjoyment and acquired knowledge (level 1 and 2 of the Kirkpatrick’s hierarchy model), we did not evaluate transfer of knowledge to the workplace and benefits to children with autism as a direct result of the CAL package.

6. It was strange that all the respondents were female. Was there any explanation for this?

All the students in Childcare and Early Years course were female. Therefore, the participants in this study were all female.
There was more enjoyment in the CAL group but no difference in ability to identify a child with confidence in autism, except in terms of co-morbidity and treatment.

Regarding the confidence to identify a child with autism, we have discussed this issue in the Discussion section in the revised manuscript (page 9-10).

Page 9-10
Participants who read the information leaflet had higher confidence in identifying a child with autism than students who watched the CAL package, but the difference did not reach statistical significance (p = 0.39, effect size = -0.3). More than 80% of participants (88% in the CAL package group and 81% in the leaflet group) had seen 5 or less children with autism. However, 6.25% of students in the leaflet group had seen more than 10 children with autism, whereas none of the students in the CAL package group had seen more than 10 children with autism. This finding is a possible explanation of why the CAL package group demonstrated an improved knowledge and enjoyment, but did not show confidence in identifying a child as autism. The findings from the study suggested that, apart from knowledge, experience in working with children with autism is another key factor in determining the level of confidence to identify a child as autism. These findings were confirmed in a recent study where teachers who had experience with children with autism demonstrated significant greater confidence than teachers who had no or little experience in identifying children as autism [36].

7. I did not think that the discussion fitted in with the results. Some of the discussion was difficult to follow. At least the CAL package was not worse that the information leaflet.

We thank the reviewer for the comment above. We agree that some part in the previous manuscript was difficult to follow. We, therefore, have carefully rewritten the Discussion section in accordance with suggestions by the reviewer. The sentence “At least the CAL package was not worse that the information leaflet” has been deleted.
Reviewer 3 (Julie Hadley)

1. The population for the study is not fully defined. Childcare students in the UK are not on a health professionals’ training programme and on qualification are not health care professionals. More information is required about the level and type of educational programme they are on so that the results of the study can be generalized. Otherwise the authors can not make assumptions regarding the external validity of their research and that the results would also be applicable to all health care professionals and doctors as these are an entirely different population (age, profession and educationally difference).

We thank the reviewer for the comments above. We agree with the reviewer that childcare students in the study were not health professionals. However, in the study, we aimed to use the CAL package in persons who work with children, not health professionals. We, therefore, used childcare students as subjects. We always keep in mind the issue about external validity.

More information is required about the level and type of educational programme they are on so that the results of the study can be generalized.

Regarding the level and educational programme, we have added this information on page 4 in the revised manuscript.

Page 4

Students who complete this vocational course will receive a Diploma qualification and become a qualified nursery nurse. The curriculum includes social and developmental aspects of young children, health care, community care, and interactions with parents. Abnormal development and autism are not included in the curriculum [24].

2. More information is required in the methods section about the intervention and the control.

The information in the methods section has been improved in the revised manuscript (page 4-5).
The study was ethically approved by the University of Nottingham Medical School Research Ethics Committee. Thirty-two students in Childcare and Early Years course from the New College Nottingham, UK were invited into the study. Students who complete this vocational course will receive a Diploma qualification and become a qualified nursery nurse. The curriculum includes social and developmental aspects of young children, health care, community care, and interactions with parents. Abnormal development and autism are not included in the curriculum [24].

All participants were asked to read the information sheets and informed consent was obtained before commencing the study. Participants were randomised by random numbers into 2 groups: the CAL package watching and the leaflet reading groups. Both groups were allowed to watch the CAL package or to read the information leaflet once for 15 minutes. After the interventions, retention performance (ability to remember and recall the information in the CAL package and the leaflet), level of enjoyment, and level of confidence were evaluated by the questionnaire and the visual analogue scales.

Also has pre-existing knowledge about autism been measured or acknowledged as this will affect the knowledge retention scores.

Due to limitations of our resources, we did not measure the pre-existing knowledge of the participants in the study. We have addressed this issue in the Discussion section on page 10 in the revised manuscript. This has also been highlighted for the benefit of the reviewer.

Secondly, in this study, participants’ knowledge about autism prior to interventions was not been evaluated. Pre-interventional knowledge would be useful in establishing
a baseline level of knowledge of the participants prior to the intervention, thus, an improvement observed in the post-intervention scores could be due to the intervention, rather than due to baseline variations between the groups.

3. Further clarification is needed regarding the CAL teaching package, does it contain information about symptoms and how to diagnose autism?

There were 5 main sections in the CAL package, which were general knowledge, diagnosis, aetiology, co-morbidity, and treatment.

How long does the CAL package take to watch?

The CAL package lasted for 12 minutes.

This information has been addressed on page 5 and has been highlighted for the benefit of the reviewer.

Page 5
There were 5 main sections in the CAL package: general knowledge, diagnosis, aetiology, co-morbidity and treatment. The CAL package lasted for 12 minutes.

4. How long after the interventions were the questionnaires administered? Was this the same for both groups?

Both groups were allowed to watch the CAL package or to read the information leaflet once for 15 minutes. After the interventions, retention performance (ability to remember and recall the information in the CAL package and the leaflet), level of enjoyment, and level of confidence were evaluated by the questionnaire and the visual analogue scales. Those are now incorporated into page 5 in the revised manuscript.

Page 5
Both groups were allowed to watch the CAL package or to read the information leaflet once for 15 minutes. After the interventions, retention performance (ability to remember and recall the information in the CAL package and the leaflet), level of enjoyment, and level of confidence were evaluated by the questionnaire and the visual analogue scales.
Could the authors provide examples of the questions?

Examples of the questions were demonstrated in Appendix I (page 18).

Also was the questionnaire previously validated or piloted?

Regarding validity of the questionnaire, we agree with the reviewer that the questionnaire should be validated or piloted. However, due to limitations of our resources, we were not able to validate the questionnaire. We have addressed this issue in the Discussion section on page 10 in the revised manuscript. This has also been highlighted for the benefit of the reviewer.

Page 10
Firstly, there was no validity test of the questionnaire. Validation of the questionnaire would have increased the validity of the study.

5. Was the person who performed the analysis blinded to the groups allocation?

The author who analysed the data did not blind to the groups allocation. This sample bias has been mentioned as a limitation of the study (page 9).

Page 9
In addition, randomization by a sequence of random numbers may result in selection bias and may lead to imbalance in groups.

6. This study has a small sample size, can the authors acknowledge this and its associated problems in the discussion section.

We always keep in mind this limitation. In the revised manuscript, we have, therefore, addressed this limitation in the Discussion section (page 9) and the Conclusion section (page 11), as suggested by the reviewer.

Page 9
However, due to relatively small numbers, caution needs to be taken in interpreting the results.
A study with appropriately powered sample size, validation of assessment tools, and pre-intervention knowledge measurement in the future may be able to confirm findings declared in the study.

- Minor Essential Revisions

The author can be trusted to make these. For example, missing labels on figures, the wrong use of a term, spelling mistakes.

1) Quite a few spelling mistakes and grammatical errors noted for example Page 3 2nd paragraph 6th line ‘Even in medical students, they still had incorrect knowledge about autism’

The revised manuscript has been edited by a native English speaker.

2) I am assuming that the authors are referring to knowledge retention when they refer to retention performance scores, can they please clarify.

“Retention performance” used in the study was an ability to remember and recall the information in the CAL package and the leaflet. We have clarified this in the Methods section (page 5) in the revised manuscript. This has also been highlighted for the benefit of the reviewer.

Page 5

After the interventions, retention performance (ability to remember and recall the information in the CAL package and the leaflet), level of enjoyment, and level of confidence were evaluated by the questionnaire and the visual analogue scales.