

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	A novel ACT-based video game to support mental health through embedded learning: A mixed-methods feasibility study protocol
AUTHORS	Edwards, Darren; Kemp, Andrew

VERSION 1 – REVIEW

REVIEWER	Giuseppe Riva Università Cattolica del Sacro Cuore, Milan, Italy
REVIEW RETURNED	26-Jun-2020

GENERAL COMMENTS	<p>I found the protocol clear and very interesting and the mixed method approach appropriate for the type of study. However I have these concerns:</p> <ul style="list-style-type: none">- NO TRIAL REGISTRATION IS PROVIDED. It is quite uncommon for protocols submitted for publication. It is also missing the ethical committee clearance;- THE LACK OF SAMPLE SIZE ESTIMATION: even if the study is a preliminary one, other ACT studies can be used for a first estimation of sample size. In my view, 25 participants may be not enough even for a feasibility/qualitative study given the complexity of the ACT game and the different sections involved.- THE LACK OF EXPLICIT CONTROL PROCEDURES FOR ONLINE DATA COLLECTION: as specified in the text: "The study will be conducted entirely online, with both the game and questionnaires (through Qualtrics) available online". However, it is not clear how the researchers will verify if the person playing the game and responding to the questionnaire will be the same for all the different sessions. A check system (i.e. using the videocamera of the PC) is strongly suggested.
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REVIEWER	Manuela Ferrari McGill University
REVIEW RETURNED	08-Sep-2020

GENERAL COMMENTS	<p>Dear Authors:</p> <p>I was invited to review your manuscript, entitled: A novel ACT-based video game to support mental health through embedded learning: A mixed-methods feasibility study protocol. I think the project is very interesting, the game is novel in nature, and the study proposal is well developed and presented.</p> <p>I would like to invite you to consider the following changes:</p>
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	<p>Major changes:</p> <p>1) Introduction: The introduction is very comprehensive but quite long. I think it can improve by presenting key content in a more succinct manner:</p> <p>a. For example, I will condense the first four paragraphs in one or two, I think the focus should be on presenting the evidence of serious video games in mental health.</p> <p>b. Also, I found that the content is not always well organized. For example, after presenting video games as therapeutic tools, the next sections should focus on biofeedback games and present a rationale for why a new game is necessary.</p> <p>c. I would like to invite you to move some of the content that describes the new video game in the methods section, for example, the paragraph about the ACT principles and how the ACT principles are deployed into the game.</p> <p>2) Methodology - Recruitment and consent: Please elaborate on purposive sampling as well as please add references. My understanding is that a purposive sampling of 25 participants will be used for both the quantitatively and qualitative components of the study. Overall sampling needs a stronger rational.</p> <p>3) Methodology: The qualitative component of the study lacks information (e.g., how focus groups/interviews will be conducted, how many focus groups/interviews). Also, primary and secondary outcomes are related to both qualitative and quantitative components of the study; I think it is important to present a balanced content on the two methodologies.</p> <p>4) Conclusion: I think the articles will improve by adding a section on study limitation, and how authors will overcome such limitations and possible obstacles, as well as by adding a section on the impact of this study.</p> <p>Minor changes:</p> <p>1) Abstract: Please present spelled-out any acronym when introduced the first time (e.g., ACT-based video game, MRC framework).</p> <p>2) Page 11 lines 3-13: Association of Contextual Behavioural Science (ACBS) website¹, and it does not require formal clinical training or accreditation to practice (Harris, 2009). Given that the principle researcher DE2 has developed previous ACT-based interventions including an eHealth format(Edwards et al., 2019), there is ample experience in this research team to develop such an intervention effectively. I found this statement a bit off; it is something I would expect to read in a grant proposal, not in the intro to a manuscript.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer 1> I found the protocol clear and very interesting and the mixed method approach appropriate for the type of study. However I have these concerns:

Reviewer 1> - NO TRIAL REGISTRATION IS PROVIDED. It is quite uncommon for protocols submitted for publication. It is also missing the ethical committee clearance;

Authors>Thanks for this, we have now provided the trial registration and details of ethical committee clearance.

Reviewer 1> - THE LACK OF SAMPLE SIZE ESTIMATION: even if the study is a preliminary one, other ACT studies can be used for a first estimation of sample size. In my view, 25 participants may be not enough even for a feasibility/qualitative study given the complexity of the ACT game and the different sections involved.

Authors> We have increased our sample size to 36, in line with the median sample size of feasibility studies (in line with the study below).

Billingham, S. A., Whitehead, A. L., & Julious, S. A. (2013). An audit of sample sizes for pilot and feasibility trials being undertaken in the United Kingdom registered in the United Kingdom Clinical Research Network database. *BMC medical research methodology*, 13(1), 104.

Reviewer 1> - THE LACK OF EXPLICIT CONTROL PROCEDURES FOR ONLINE DATA COLLECTION: as specified in the text: "The study will be conducted entirely online, including both the game and questionnaires (via the Qualtrics platform) ". However, it is not clear how the researchers will verify if the person playing the game and responding to the questionnaire will be the same for all the different sessions. A check system (i.e. using the videocamera of the PC) is strongly suggested.

Authors> Many thanks for this useful suggestion. We have now included a check system which involves participants being given a unique identifier code for log-in, which will allow us to record meta-data of log-in and log-out, as well as how long the game was played for and what sessions of the game were completed for each participant. This will be done instead of direct video camera which may cause privacy concerns. The same identifier code will be used for the questionnaire, which will log how long the participant spent completing the questionnaire, ensuring they are not rushing through, and utilizes reverse score questions which ensures participants are paying attention. Finally, the questionnaire, post intervention, will ask the participant about adherence to the intervention and questionnaire.

Reviewer: 2

Reviewer> I think the project is very interesting, the game is novel in nature, and the study proposal is well developed and presented. I would like to invite you to consider the following changes:

Authors> Many thanks for your kind comments.

Reviewer 2> 1) Introduction: The introduction is very comprehensive but quite long. I think it can improve by presenting key content in a more succinct manner:

a. For example, I will condense the first four paragraphs in one or two, I think the focus should be on presenting the evidence of serious video games in mental health.

Authors> We have now condensed the first four paragraphs, as suggested.

Reviewer 2> b. Also, I found that the content is not always well organized. For example, after presenting video games as therapeutic tools, the next sections should focus on biofeedback games and present a rationale for why a new game is necessary.

Authors> We have moved the paragraph on demographics of game users before introducing videogames as a therapeutic tool, and how these are applied through gamification. This then now leads into the various games, their limitations, and our justification, as requested.

Reviewer 2> c. I would like to invite you to move some of the content that describes the new video game in the methods section, for example, the paragraph about the ACT principles and how the ACT principles are deployed into the game.

Authors> We feel that we should introduce ACT in the introduction, however, we have now moved some of the text specific to the implementation of ACT as an intervention to the methods section, as you have suggested.

Reviewer 2> 2) Methodology - Recruitment and consent: Please elaborate on purposive sampling as well as please add references. My understanding is that a purposive sampling of 25 participants will be used for both the quantitatively and qualitative components of the study. Overall sampling needs a stronger rational.

Authors> We have now elaborated on these points and have also included a reference to justify the sample size.

Reviewer 2> 3) Methodology: The qualitative component of the study lacks information (e.g., how focus groups/interviews will be conducted, how many focus groups/interviews). Also, primary and secondary outcomes are related to both qualitative and quantitative components of the study; I think it is important to present a balanced content on the two methodologies.

Authors> We have included additional details for the qualitative component, which include details of when the focus group will take place and how many participants will be allocated to each focus group.

Reviewer 2> 4) Conclusion: I think the articles will improve by adding a section on study limitation, and how authors will overcome such limitations and possible obstacles, as well as by adding a section on the impact of this study.

Authors> A section on limitations, how these will be overcome, and impact of the study sections have now been included.

Minor changes:

Reviewer 2> 1) Abstract: Please present spelled-out any acronym when introduced the first time (e.g., ACT-based video game, MRC framework).

Authors> Thanks, and done.

Reviewer 2> 2) Page 11 lines 3-13: Association of Contextual Behavioural Science (ACBS) website¹, and it does not require formal clinical training or accreditation to practice (Harris, 2009). Given that the principle researcher DE2 has developed previous ACT-based interventions including an eHealth format (Edwards et al., 2019), there is ample experience in this research team to develop such an intervention effectively. I found this statement a bit off; it is something I would expect to read in a grant proposal, not in the intro to a manuscript.

Authors> We have removed this as requested.

VERSION 2 – REVIEW

REVIEWER	Giuseppe Riva Università Cattolica del Sacro Cuore, Milan, Italy
REVIEW RETURNED	21-Oct-2020

GENERAL COMMENTS	The authors successfully replied to the different issues I raised in my previous review. I think that the paper is now ready for publication.
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REVIEWER	Manuela Ferrari McGill University
REVIEW RETURNED	25-Oct-2020

GENERAL COMMENTS	Dear Authors, Thank you for answering each of my comments and questions; I am satisfied with the changes made to the paper. I am looking forward to seeing this work published.
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