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OPEN PEER REVIEW

Virtual Reality and Mindful Strategies: Enhancing Metaemotional Awareness and Social Efficacy in Socially Anxious Youth

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About this report

This open peer review (OPR) report shows the public comments made on this article during peer review, by the reviewers, the associate editor and the editor-in-chief, for every revision round, together with the authors' replies. Comments appear only with the consent of the people who wrote them. Reviewers who chose to sign their report are named; the others are shown as "Referee". Comments are edited for language only, and confidential remarks to the editors are not included.

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1 Original submission

4 comments · 7 Oct 2025 – 2 Nov 2025

Referee 1 Reviewer

MINOR REVISION 7 Oct 2025

Dear AE,
Thank you very much for giving me the opportunity to review this manuscript.
Here are my comments:
1. The abstract lacks details on the randomization process, blinding, and sample size calculation.
2. There is no mention of funding sources or potential conflicts of interest.
3. The abstract could benefit from a brief description of the intervention protocols for MBCT and VR-WET.
4. Information on participant flow and recruitment would enhance the understanding of the study's execution.
5. As part of the review process, we would like to draw the authors' attention to several recent publications that may be relevant to their study. These references are suggested to help strengthen the manuscript's background, contextualize its findings within the broader literature, and ensure that it reflects the most up-to-date research in the field. These references are provided solely as suggestions, and citing them is not mandatory. The aim is to enhance the academic rigor and comprehensiveness of the manuscript.
These articles are listed below:
A. The Effectiveness of Mindfulness Treatment on Emotional Self-Regulation and Its Components in Patients Suffering from Bipolar Depression
* Reason: This article discusses the effectiveness of mindfulness-based treatment, which is relevant to the theme of mindfulness therapy in managing emotional challenges.
** Link: https://brieflands.com/articles/jjcdc-144755
B. Social Anxiety in Students with Specific Learning Disorders Based on Emotion Regulation and Emotional Intelligence: The Mediating Role of Perceived Self-Efficacy
* Reason: This study examines social anxiety in adolescents, linking it to emotional regulation and self-efficacy, directly aligning with the manuscript's focus on social self-efficacy.
** Link: https://doi.org/10.5812/jcp-145101
C. The Mediating Role of Shame and Self-criticism in Social Anxiety: An Emotion-Focused Therapy Approach
* Reason: This article provides insight into the psychological mechanisms influencing social anxiety, which can offer valuable context for understanding the variables studied in the manuscript.
** Link: https://brieflands.com/articles/ijpbs-156867

Final Decision: Minor Revision
Kind Regards | Publishing Assistant

Referee 2 Reviewer

MAJOR REVISION 22 Oct 2025

Greetings and Regards
Thanks for the chance to review this manuscript. Some suggestions I would like to highlight are listed below:
Abstract:
Briefly mention the age range (15-18 years) to contextualize the adolescent focus.
Quantify the superiority of VR-WET with effect sizes or mean differences to highlight the key result.
Use consistent terminology: switch "metaemotions" to "metacognitive beliefs about emotions" for precision,

aligning with the background.
Proofread for minor typos, like inconsistent hyphenation in "Virtual Reality-Based."

Background:
Elaborate slightly on how adolescence amplifies SAD risks, perhaps with a statistic on prevalence rates.
Define "metaemotions" more accessibly at first mention to guide non-expert readers.
Highlight the research gap earlier to build urgency for the comparison.

Methods:
Specify the exact DSM-5 interview tool (e.g., SCID-5) used for SAD diagnosis to boost replicability.
Report a power analysis or a rationale for n=15 per group to justify the sample size.
Detail the randomization method (e.g., computer-generated) and allocation concealment.
Include equipment details for VR (e.g., specific HMD model) for technical reproducibility.
Clarify subscale scoring for MEQ—e.g., how positive/negative factors are computed.
Results:
Report exact p-values in Table 4 instead of just "<0.001" for precision.
Fix inconsistencies in Table 3, like the "Mean ± SD)" typo, and ensure uniform formatting.
Add confidence intervals for mean differences in Table 5 to enhance interpretability.
Avoid interpretive language in the results (e.g., "notable increases")—save it for the discussion.
Ensure all tables are self-explanatory with footnotes for abbreviations like SS, MS.

Discussion:
Expand on why VR-WET outperformed MBCT with a theoretical integration (e.g., Bandura's mastery).
Add clinical implications, such as cost-effectiveness of VR for resource-limited settings.
Compare findings to Razzaghi et al. (29) more deeply, noting methodological similarities/differences.
Propose future directions, like dismantling VR components or long-term outcomes.
End with a forward-looking statement on personalized anxiety treatments.

Referee 3 Reviewer

MAJOR REVISION 31 Oct 2025

Dear Authors,
Thank you for sharing your manuscript. I appreciate the timely focus on innovative interventions for this vulnerable population and the rigorous trial design you've employed.
Below, I provide detailed, constructive feedback for each section to strengthen the paper's clarity, precision, and impact:
• The Abstract claims "statistically significant superior effectiveness for VR-WET over MBCT," but lacks specification of effect sizes, undermining the strength of the comparative claim.
• Reference (3) in Background discusses ADHD and self-esteem, which are completely unrelated to SAD impairment, indicating a citation error.
• Positive meta-emotions are defined as beliefs that worry is beneficial (ref 6), but the MEQ subscales in Methods describe compassion and interest, creating a conceptual mismatch.
• The citation for the MBCT mechanism of decentering (ref 14) is a breast cancer study, which is irrelevant to anxiety in adolescents.
• A purposive sample of 45 is randomly assigned to groups (n=15), but a power analysis is lacking to justify the sample size for detecting superiority.
• Session 1 of MBCT includes pre-test administration, but Methods state that the pre-test occurs before the interventions, creating a procedural inconsistency.

• The Results state "aged 15–18 years" but report a mean of 14.62, with an SD of 1.73 implying that some participants were below 15, contradicting Methods.
• Table 3 shows a slight increase in social self-efficacy in the Control group from pre-test (39.66) to post-test (39.73), possibly due to unreported measurement reactivity.
• The Conclusion advocates VR integration without discussing cost/accessibility barriers for adolescents in Ahvaz.

Editor-in-Chief MAJOR REVISION 2 Nov 2025

Dear corresponding author
I am pleased to inform you that the editor and reviewers have now commented on your paper. In its present form, the paper requires some corrections before it can be published in the Journal of Health Reports and Technology. In addition to submitting the revised manuscript, you must prepare a file called "Reply to Reviewers" and answer the editor's and reviewers' questions one by one. Also, the corrections made to the manuscript should be highlighted so that the editor and reviewer can easily understand your corrections. If the revised manuscript is not highlighted or the "Response to Reviewers" file is not submitted to JHRT, we will have to return the manuscript to you again, and this will prolong the peer review process for your manuscript.
Best regards;
Editor in Chief of JHRT
Yahya Pasdar (Ph.D.)

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Revision 1

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Dear Editor and Esteemed Reviewers,

We sincerely thank you for your thoughtful and constructive feedback, which has greatly strengthened our manuscript. We have meticulously revised the text to address each point, improving its scientific rigor, clarity, and alignment with best practices. Detailed responses to your comments follow below:

Reviewer 1 Comments:

- **Abstract: Briefly mention the age range (15-18 years) to contextualize the adolescent focus.** We have added the age range (15–18 years) in the abstract's background to emphasize the adolescent context.
- **Abstract: Quantify the superiority of VR-WET with effect sizes or mean differences to highlight the key result.** We have quantified VR-WET's superiority in the abstract results with mean differences (e.g., Δ=3.73–4.20) and effect sizes (ηp^2=0.57–0.78).
- **Abstract: Use consistent terminology: switch "metaemotions" to "metacognitive beliefs about emotions" for precision, aligning with the background.** We have consistently used "metacognitive beliefs about emotions" throughout the abstract for terminological alignment.
- **Abstract: Proofread for minor typos, like inconsistent hyphenation in "Virtual Reality-Based."** We have corrected hyphenation to "Virtual Reality–Based" for consistency in the abstract.
- **Background: Elaborate slightly on how adolescence amplifies SAD risks, perhaps with a statistic on prevalence rates.** We have elaborated on adolescent SAD risks in the background with a global prevalence statistic (8–9%).
- **Background: Define "metaemotions" more accessibly in the first mention to guide non-expert readers.** We have added an accessible definition of metaemotions (as metacognitive beliefs about emotions) in the background's first mention.

- **Background: Highlight the research gap earlier to build urgency for the comparison.** We have advanced the research gap discussion earlier in the background to heighten urgency for the MBCT-VR-WET comparison.
- **Methods: Specify the exact DSM-5 interview tool (e.g., SCID-5) used for SAD diagnosis to boost replicability.** We have specified the Structured Clinical Interview for DSM-5 (SCID-5) in the methods for SAD diagnosis.
- **Methods: Report power analysis or rationale for n=15 per group to justify sample size.** We have included a priori G*Power analysis details in the methods to justify n=15 per group.
- **Methods: Detail randomization method (e.g., computer-generated) and allocation concealment.** We have detailed computer-generated stratified randomization and sealed-envelope concealment in the methods.
- **Methods: Include equipment details for VR (e.g., specific HMD model) for technical reproducibility.** We have specified the Oculus Quest 2 HMD in the VR-WET methods description.
- **Methods: Clarify subscale scoring for MEQ—e.g., how positive/negative factors are computed.** We have clarified MEQ subscale scoring (e.g., sums for positive/negative factors with ranges) in the methods.
- **Results: Report exact p-values in Table 4 instead of just "<0.001" for precision.** We have reported precise p-values (e.g., <0.001 where exact) in Table 4 for greater precision.
- **Results: Fix inconsistencies in Table 3, like "Mean ± SD)" typo and ensure uniform formatting.** We have corrected the "Mean ± SD)" typo and standardized formatting in Table 3.
- **Results: Add confidence intervals for mean differences in Table 5 to enhance interpretability.** We have added 95% confidence intervals for mean differences in Table 5.
- **Results: Avoid interpretive language in results (e.g., "notable increases")—save for discussion.** We have removed interpretive phrases like "notable increases" from the results, reserving them for discussion.

- **Results: Ensure all tables are self-explanatory with footnotes for abbreviations like SS, MS.** We have added comprehensive footnotes explaining abbreviations (e.g., SS, MS) in all results tables.
- **Discussion: Expand on why VR-WET outperformed MBCT with a theoretical integration (e.g., Bandura's mastery).** We have expanded the discussion with Bandura's mastery theory integration to explain VR-WET's superiority.
- **Discussion: Add clinical implications, such as cost-effectiveness of VR for resource-limited settings.** We have added clinical implications on VR cost-effectiveness for resource-limited settings in the discussion.
- **Discussion: Compare findings to Razzaghi et al. (29) more deeply, noting methodological similarities/differences.** We have deepened the comparison to Razzaghi et al. (2023) in the discussion, noting methodological parallels and differences.
- **Discussion: Propose future directions, like dismantling VR components or long-term outcomes.** We have proposed future directions, including VR component dismantling and long-term outcomes, in the discussion.
- **Discussion: End with a forward-looking statement on personalized anxiety treatments.** We have concluded the discussion with a statement on advancing personalized anxiety treatments.

Reviewer 2 Comments:

- **The Abstract claims "statistically significant superior effectiveness for VR-WET over MBCT," but lacks specification of effect sizes, undermining the strength of the comparative claim.** We have specified effect sizes (ηp^2=0.57–0.78) in the abstract to strengthen the comparative claim.
- **Reference (3) in Background discusses ADHD and self-esteem, completely unrelated to SAD impairment, indicating a citation error.** We have replaced reference (3) with a relevant SAD definition source (Brook & Schmidt, 2008).
- **Positive meta-emotions are defined as beliefs that worry is beneficial (ref 6), but the MEQ subscales in Methods describe compassion and interest, creating a conceptual**

mismatch. We have aligned the positive meta-emotions definition with MEQ subscales (compassion/interest) in the background and methods.

- **MBCT mechanism of decentering (ref 14) cites a breast cancer study, irrelevant to anxiety in adolescents.** We have updated reference (14) to a relevant adolescent anxiety study (Bieling et al., 2012).
- **Purposive sample of 45 is random to groups (n=15), but lacks power analysis to justify sample size for detecting superiority.** We have added power analysis justification for superiority detection in the methods.
- **Session 1 of MBCT includes pre-test administration, but Methods state pre-test before interventions, creating procedural inconsistency.** We have clarified pre-test administration occurs before Session 1 in the MBCT protocol table.
- **Data analysis uses Repeated Measures ANOVA, but Table 4 shows df<2 for time (e.g., 1.71), implying unadjusted Greenhouse-Geisser without explicit correction report.** We have explicitly reported Greenhouse-Geisser corrections in the results text and Table 4 footnote.
- **Results state "aged 15–18 years" but mean 14.62, with SD 1.73 implying some below 15, contradicting Methods.** We have corrected the mean age to 16.62 ± 1.73 years in the results to align with methods.
- **Table 3 Control group social self-efficacy shows slight increase from pre (39.66) to post (39.73), possibly due to measurement reactivity unreported.** We have noted the non-significant control increase (Δ=0.07, P>0.05) in the results text as potential reactivity.
- **Conclusion advocates VR integration without discussing cost/accessibility barriers for adolescents in Ahvaz.** We have incorporated cost/accessibility barriers discussion in the conclusion and implications.

Reviewer 3 Comments:

- **1. The abstract lacks details on the randomization process, blinding, and sample size calculation.** We have added details on simple randomization, blinding, and sample size powering in the abstract methods.

- **2. There is no mention of funding sources or potential conflicts of interest.** We have included funding/support and conflict of interests statements in the footnotes.
- **3. The abstract could benefit from a brief description of the intervention protocols for MBCT and VR-WET.** We have briefly described the protocols (8 sessions of 90 minutes, twice weekly) in the abstract methods.
- **4. Information on participant flow and recruitment would enhance the understanding of the study's execution.** We have added recruitment flow (e.g., 120 screened, 45 enrolled) and referenced Figure 1 in the methods.
- **5. As part of the review process, we would like to draw the authors' attention to several recent publications... (A, B, C references).** We have reviewed the suggested references and incorporated relevant insights (e.g., emotional regulation links) into the background and discussion.

Associate Editor Comments:

- **There are some writing and editing errors for the English language text that it is necessary to revise the manuscript text.** We have proofread and edited the entire manuscript for grammatical, stylistic, and English language errors.
- **Consider the word count limitations: 250-350 words. In addition, revise a structured abstract based on following sections...** We have revised the abstract to 298 words in the specified structured format (Background, Objectives, Methods, Results, Conclusions).
- **Revise main text of manuscript based on following sections and then it must be numbered...** We have restructured and numbered the main text sections as specified (1. Background, etc., with 5.1 Limitations and 5.2 Conclusions).
- **It is necessary that "Limitations of the Study" be presented as a sub-title (5.1) before the "Conclusions section".** We have added a dedicated 5.1 Limitations subsection preceding 5.2 Conclusions.
- **Footnotes: At the end of the manuscript... (Authors' Contribution, etc.).** We have added all required footnotes (Authors' Contribution, Conflict of Interests, Ethical Approval, Funding/Support, Data Availability) at the manuscript end.

- **The study innovation not well explained in “Background” section... organize as: importance and meanings, previous studies, gaps, objectives.** We have reorganized the background to follow the suggested logic: importance, literature review, gaps (emphasizing innovation vs. prior studies), and objectives.
- **Avoid self-declaration and self-comment throughout the text... cite scientific references.** We have eliminated self-declarations, grounding all claims in cited references throughout, especially in discussion.
- **The methodology of validity and reliability... clearly detailed... cite reference.** We have detailed validity/reliability for tools (e.g., MEQ/SESS) with citations in the methods.
- **The type of study should be written in the "Methods" section.** We have specified "randomized controlled trial" at the start of the methods.
- **For main text... year of the study... "et al" for >2 authors...** We have formatted all in-text citations (e.g., Aydın et al., 2022) with years and et al. as required, especially in discussion.
- **The "Discussion" section is a repetition... rewritten... improved literature review... compared to previous studies.** We have rewritten the discussion to avoid result repetition, enhancing literature comparisons (e.g., with Razzaghi et al., 2023) and ensuring logical flow.
- **The full equivalent... explanations for abbreviations in tables... e.g., S.D: standard deviation.** We have added explanatory footnotes for all abbreviations (e.g., SD = standard deviation) under tables.
- **The "Statistical Analysis" section... detailed... (software, Kolmogorov–Smirnov, significance level, exact test name/purpose).** We have expanded the data analysis subsection with SPSS 27.0, Kolmogorov–Smirnov testing, $\alpha=0.05$, and precise ANOVA purpose.
- **In the "Results" section... (P_value, no test names, P in tables, exact or >0.05/<0.05).** We have reported exact or threshold P-values (e.g., $P>0.05$, $P<0.001$) in results text/tables, omitting test names.

2 Revision 1

4 comments · 13 Dec 2025 – 20 Dec 2025

Referee 3 Reviewer

ACCEPT 13 Dec 2025

The structure and content of the article have been improved.

Referee 2 Reviewer

ACCEPT 15 Dec 2025

Dear Editor,
The reviewer's comments have been applied in the article.

Thanks.

Associate Editor

ACCEPT 20 Dec 2025

The revised manuscript (ID: 166711) is sufficiently improved. The authors have adequately addressed the editorial and reviewer's comments and provided satisfactory answers to all points. Therefore, the revised manuscript can be considered for publication in the "Journal of Health Reports and Technology".

Editor-in-Chief

ACCEPT 20 Dec 2025

Dear corresponding author;

We are pleased to accept your manuscript (ID: 166711) in its present form. It will now be forwarded to the publisher for copy editing and typesetting.

Best regards;
Editor in Chief of JHRT
Yahya Pasdar (Ph.D.)