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International Journal of Cancer Management

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Peer Review Report for "Design and Evaluation of an mHealth Intervention for HPV Knowledge and Cervical Cancer Screening"

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Review Timeline:

Submit Date:	17 May 2025
Revised Date:	9 Aug 2025
Accepted Date:	26 Aug 2025

Revision (0)

Here, you can see the **Reviewers**, **Associate Editors** and **EICs'** comments from the beginning to the end of the revision process.

Abolfazl Payandeh : Reviewer

8 Jun 2025

To the Associate Editor,

The manuscript titled "Design and Evaluation of a Mobile Health Intervention to Enhance HPV Knowledge and Promote Cervical Cancer Screening: A Mixed Methods Study" addresses an important and timely topic with clear public health relevance. The study's focus on leveraging mobile health tools to improve awareness and screening behaviors for cervical cancer is commendable and aligns well with current efforts in preventive healthcare. The use of a mixed methods approach adds depth and credibility to the findings. However, the manuscript contains several English language and grammatical errors that occasionally obscure the meaning and hinder readability.

I have some comments that I hope will help strengthen the manuscript (16 comments).

(Please follow the attached file)

Majid Mokhtari : Reviewer

27 Jun 2025

Manuscript Number:

International Journal of Cancer Management – 162703

Title of the Manuscript:

Design and Evaluation of A Mobile Health Intervention to Enhance HPV Knowledge and Promote Cervical Cancer Screening: A Mixed Methods Study

Summary:

This study developed and evaluated a mobile health app (HPV-Bye) based on the Health Belief Model (HBM) to improve women's knowledge about HPV and cervical cancer screening, and to encourage Pap smear uptake. Results showed significant improvements in knowledge, HBM constructs, and screening rates among app users compared to controls. Despite the good idea, there are some concerns that need to be addressed.

Decision:

I recommend that this paper not be accepted without major revision.

Major Concerns:

1. The formula for sample size calculation (Equation No. 1) is mentioned but lacks context (e.g., expected effect size, power). Clarify assumptions (e.g., 80% power, effect size from prior studies) to justify the sample size.
2. While user and expert validation are described, the process for selecting the 15 women and 15 experts is unclear. Detailed recruitment criteria (e.g., diversity in age, education) to ensure representativeness.
3. The "single-blind" aspect is not explained (who was blinded?). Specify blinding (e.g., outcome assessors) to align with CONSORT guidelines.
4. RM-ANOVA is used but lacks detail on handling missing data (23 excluded participants). Address attrition (e.g., intention-to-treat analysis) to mitigate bias.
5. Overemphasis on positive results without critical examination of limitations (e.g., self-reported bias, short follow-up).
6. No comparison to similar apps (e.g., HPV vaccine decision aids) to contextualize innovation.

Minor Concerns:

1. Given the dynamic nature of this field, more recent studies (particularly from 2022–2024) should be included to keep the review current.
2. In both the introduction and discussion, several statements about global research trends, AI applications, and ultrasound usage lack proper citation. These claims should be supported by relevant references.

3. This article does not appear to focus on gene-level analysis. However, if any gene names are used, they should be italicized, while protein names remain in standard font.

4. Research Articles 23, Review Articles 12. While Review Articles provide helpful context, it is advisable for the authors to reference more Research Articles to support their analysis with original data. Over-reliance on reviews may reduce the manuscript's perceived originality.

REFeree : Associate Editor

28 Jun 2025

To EIC,

This manuscript needs revision based on the reviewer's comments

REFeree : EIC

28 Jun 2025

Dear Author,

Please revise the manuscript according to the comments of the reviewers and resubmit.

Thank You

OPEN PEER REVIEW

Revision (1)

Reply to Reviewers

Ideally, the reviewing process can significantly improve the submitted manuscripts by allowing the authors to take into account the advice of reviewers. Author(s) must reply to all reviewers' comments in a separate Word file, point by point. A "**Reply to Reviewers**" document is submitted along with revised manuscript during submission of revised files, summarizing the changes that the authors made in response to the reviewers' comments. The responses to reviewers' comments specifies how the authors addressed each comment the reviewers made.

You can read the authors' responses to the reviewers' comments in the next page.

Dear Editor, Hi

We sincerely appreciate the reviewer 's insightful and precise comment, which greatly contributes to improving the clarity of our manuscript. We fully agree with this important points raised by the reviewers. The revised points are presented below.

Reviewer 1:

Q1,2,3,4 : Thank you for your comments. All items were revised.

Q5: All required parameter estimations for the sample size calculation were added and explained.

Q6: The reference has been added to support Equation1.

Q7: It was revised.

Q8: This process had been conducted as described(forward-backward method by two expert in reproductive health and health education with proven English language proficiency) and it has been added to the manuscript.

Q9: Figure 1(study flowchart) was submitted separately as a supplementary file according journal guideline; A reference remains in the text.

Q10: Thank you for your attention. The full label was already entered as family history of cervical cancer but was not visible due to table formatting. It has been adjusted.

Q11: Thank you. A typographical error in the value for nulliparous and multiparous women in the control group has been corrected.

Q12: The score ranges have been included under each variable name in Table 2.

Q13: Thank you. The statistical test(Repeat measures ANOVA) has been added below Table 2.

Q14: Thank you for your comment. While both groups showed significant within-group changes, the significant time-by-group interaction confirms the greater effectiveness of the educational mobile application compared to routine care alone. This point has been clarified in the revised manuscript(Results and discussion sections).

Q15: The limitations and recommendations have now been clearly stated in separate, well-ordered paragraphs.

Q16: References 5 and 9 have been revised with correct citation details, including web address and access dates.

Reviewer 2:

Major concerns:

Q1: It is an important point. The sample size was calculated based on an expected increase in pap smear uptake from 28% to 50% with 80% power and a 5% significant level and 10% dropout. It was set at 380 participants(180 per group). This has been added to methods section.

Q2: 15 women were selected as described in the study participant and 15 expert with relevant backgrounds were recruited for App validation. This has been clarified in the revised manuscript.

Q3: As the nature of intervention(mobile app) blinding of participants and researcher was not feasible. However the data analyst was blinded. This has been clarified in the revised manuscript.

Q4: The app required users to fully complete each questionnaire before proceeding. The 23 participant who discontinued the study midway and left data incomplete were excluded from the complete-case analysis. This has been clarified in the manuscript.

Q5: In response to your valuable suggestion, the limitations section has been revised and expanded accordingly.

Q6: The innovative aspects of our study have been revised and highlighted in the final of the introduction section.

Minor concern:

Q1, Q4: Thank you for highlighting the need to strengthen the literature review with more recent and research-based sources. In response, two recent primary studies (2023 and 2024) on digital HPV interventions were added to the discussion section to enhance the relevance and currency of the review.

Q2: Thank you for your thorough attention. One missing reference was identified during our review and has been added as reference 72.

Q3: The mentioned elements have been carefully reviewed and corrections were applied where necessary

Q4: Addressed in response to Q1.

AI Comments:**Major comments:**

Q1: we have added Randomized Controlled Trial to the title to clearly indicate the study design.

Q2: We have revised the abstract to include 95% confidence interval and added them in results section .

Q3: we have added and revised the limitations and recommendations in two separate sections .

Minor comments:

Q1: Participant were randomly assigned to intervention and control groups in 1:1 ratio that was added in method section (Procedure).

Q2: Eligibility criteria are detailed in the method section(Study Participants); they were omitted from the abstract due to word limits.

Q3: This study was funded by Shahid Beheshti university that was mentioned in Acknowledgments section.

***Following the revisions made in response to the reviewers' suggestions, additional references were incorporated in to the manuscript. As a result, the references section has been modified.**

With best regards

Dr Zohreh Keshavarz

OPEN PEER REVIEW

Revision (1)

Majid Mokhtari : Reviewer

19 Jul 2025

Manuscript Number:

International Journal of Cancer Management – 162703

Title of the Manuscript:

Design and Evaluation of A Mobile Health Intervention to Enhance HPV Knowledge and Promote Cervical Cancer Screening: A Mixed Methods Study

Summary:

In my view, the research is well-founded, and with the implemented revisions and corrections, the previously raised concerns have been effectively addressed. Consequently, the study now stands as a valid contribution to the readers of this journal. The authors' commendable efforts to enhance and refine the content are sincerely appreciated.

Decision:

I recommend that this paper be accepted.

REFEREE : Associate Editor

20 Jul 2025

Dear EIC

Manuscript is ready to be published

REFEREE : EIC

20 Jul 2025

Dear Author,

Please revise the manuscript according following comments and resubmit.

Thank You

--Consider shortening the title to "Design and Evaluation of an mHealth Intervention for HPV Knowledge and Cervical Cancer Screening."

--In the abstract, specify the study setting (country/region) and, if available, include the clinical trial registration number.

---Introduction and Background

Reorganize into five concise paragraphs:

HPV biology and high-risk genotypes

Global and Iran-specific prevalence data

Importance of vaccination and Pap-smear screening

Cultural barriers and awareness gaps

Role of mHealth and the Health Belief Model (HBM) in Iran

Eliminate repetitive statistics by presenting each key figure once with proper citation.

Conclude with a clear statement on how mHealth can address these gaps and why Iran-specific research is needed.

As you know, Iran does not have a formal cervical cancer screening program, and HPV infection does not inevitably lead to cervical cancer—this crucial point should be noted at the very beginning of the manuscript.

Methods

---State the study location, ethical approval, and trial registration number if it has.

Detail sample-size calculation, recruitment period, and full description of qualitative methods (e.g., number of interviews, thematic analysis).

Specify which statistical tests were used for each outcome (e.g., repeated-measures ANOVA, chi-square) and the software version.

--Results

Add a CONSORT flowchart to illustrate enrollment, allocation, follow-up, and analysis.

Present mean±SD for each HBM construct at baseline, immediately post-intervention, and eight weeks later in a concise table.

Report effect sizes alongside p-values to convey the magnitude of change.

Clarify whether Pap-smear uptake was self-reported or verified via medical records.

----Discussion and Conclusion

Structure with clear subheadings:

Interpretation of Key Findings

Comparison with Previous Literature

Study Limitations

Future Recommendations

Highlight any unique features of your app (e.g., audio installation guide) in a dedicated paragraph.

Specify the generalizability of results (e.g., age range, cultural context).

Include effect-size metrics to emphasize the intervention's impact.

Expand on strategies for sustaining engagement (e.g., periodic reminders, updated content) with citations.

Please note the statistics of HPV and cervical cancer in Iran and emphasize that this is not the 10th most prevalence cancer in Iran despite western countries.

OPEN PEER REVIEW

Revision (2)

Reply to Reviewers

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You can read the authors' responses to the reviewers' comments in the next page.

Responses to reviewer

We sincerely appreciate your thorough review, thoughtful comments and constructive feedback, which have significantly enhanced the quality of our manuscript.

Title and Abstract:

- We consider shortening the title to Design and Evaluation of An mHealth Intervention for HPV knowledge and Cervical Cancer Screening.
- The statement regarding the study setting is already included in the first line of the Methods section in the abstract and the number of RCT has been added to the abstract(end of method section).

Introduction and background:

-The Introduction was already structured around the key thematic areas suggested, including HPV biology, global and Iran-specific prevalence, vaccination and screening importance, cultural barriers, and the role of mHealth and the Health Belief Model in Iran. However, based on the editor's valuable feedback, we have further revised and refined the section to enhance clarity and ensure full alignment with the recommended structure. Additionally, a new sentence emphasizing the cultural taboos around HPV and the lack of mHealth-based HBM studies in Iran has been added. To respect the reviewer's suggestion, we have removed the repetitive statistic .

-A clarification about the non-inevitability of HPV infection leading to cervical cancer was added at the beginning.

Methods:

- The clinical trial was registered prospectively in the Iranian Registry of Clinical Trials (IRCT), and the registration number is mentioned in both the abstract and the Ethics section.

-The details of sample size calculation have previously been addressed in the "Study Participants and Sampling" section. In accordance with your request, the effect size(Cohen's $h=0.46$) has now been included.

- The statistical tests used for each outcome and the software version are clearly specified in the Statistical Analysis section, which has been highlighted in the revised manuscript

Results

-A flowchart was already provided, and we will revise it to follow the standard CONSORT diagram format.

- A requested table has already been included as Table 2, in the manuscript. Following your suggestion, we have added the column for effect size to this table.

- Pap-smear uptake was verified by medical test results, which participants uploaded through the mobile app. It has added to Outcome Measures section.

Discussion and conclusion:

- We have structured the Discussion section with clear subheadings including Interpretation of Key Findings, Comparison with Previous Literature, Study Limitations, and Future Recommendations, as requested. We have also enhanced the clarity of these subsections to ensure better readability. We are willing to make further adjustments if needed.

- Unique app features, generalizability, effect sizes, engagement strategies and Iran specific cancer state were added to the recommendation section.

With best regards

Dr Zohreh Keshavarz

OPEN PEER REVIEW

Revision (2)

REFEREE : Associate Editor

3 Aug 2025

This manuscript is ready to be published.

REFEREE : EIC

3 Aug 2025

Dear Author,

The Introduction section needs revision regarding the incidence and age distribution of cervical cancer. It currently includes incorrect information. Cervical cancer is the 4th most common cancer among women in Western countries but ranks 11th in Iran. Also, the average age of patients in Iran is about 10 years higher than in the West. Please revise the text accordingly and cite the article I've shared bellow:

<https://www.frontiersin.org/journals/oncology/articles/10.3389/fonc.2023.1132369/full>

OPEN PEER REVIEW

Revision (3)

Reply to Reviewers

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You can read the authors' responses to the reviewers' comments in the next page.

Dear Editor,

Thank you for your valuable feedback. In accordance with your suggestion, we have revised the *Introduction* section to accurately reflect the incidence and age distribution of cervical cancer. Specifically, we have noted that cervical cancer ranks 11th among cancers in Iran, and that the average age of patients is approximately 10 years higher than in Western countries. The recommended reference (Frontiers in Oncology, 2023) has been appropriately cited. It has been highlighted in the manuscript.

With best regards

Dr Zohreh Keshavarz

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Revision (3)

REFEREE : EIC

26 Aug 2025

Dear Author,

Thank you for submitting your work to IJCM.