

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

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| TITLE (PROVISIONAL) | Effects of a video intervention on physicians' acceptance of pain apps: a randomized controlled trial |
| AUTHORS | Hein, Hauke; Glombiewski, Julia Anna; Rief, Winfried; Riecke, Jenny |

VERSION 1 – REVIEW

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| REVIEWER | Severin Hennemann University of Mainz, Dep. of Clinical Psychology, Psychotherapy and Experimental Psychopathology |
| REVIEW RETURNED | 30-Dec-2021 |

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| GENERAL COMMENTS | <p>Thank you for inviting me to review this interesting and valuable manuscript. The authors report on a pre-registered, randomized experimental trial studying the acceptance (i.e., behavioral intention) and its potential determinants of health apps in the context of chronic pain in a convenient sample of (mostly outpatient) physicians and medical students. The study is well-designed, theory-based, adequately powered and the reporting of findings is concise and well-structured. The study has important clinical implications concerning the implementation of mHealth in clinical practice and is likely to inform scientists and clinicians about the potential of AFIs. However, I see some room for improvements and outlined some suggestions below.</p> <p>----- Introduction -----</p> <p>(1) Most (freely) available apps for chronic pain cannot be recommended currently, as these lack scientific evaluation and have serious privacy issues, posing a potential threat to users, as concluded by a recent systematic review by Terhorst et al. 2021 (https://doi.org/10.1016/j.invent.2021.100376). Despite all the potential that the authors correctly point out, these limitations could be made clearer. Also, concrete evidence for the efficacy/effectiveness of mhealth for chronic pain (e.g., https://doi.org/10.1093/pm/pnz164, https://doi.org/10.3390/jcm9113557) could be added, since this forms an important basis for studying performance expectancy.</p> <p>----- Methods -----</p> <p>(2) Please provide details on randomization (allocation ratio, block sizes) and (b) add information on the lengths of videos. (3) The term “health apps”, which is used for the (UTAUT) items is perhaps too broad (e.g. could include communication, diagnosis, monitoring, intervention, etc.) and I wonder why you did not specify</p> |
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| | <p>“apps for chronic pain (condition/patients)”? Did you cross-check, what the participants understood of “health apps”?</p> <p>(4) Effort expectancy: I find the “user” perspective somewhat confusing since physicians would foremost prescribe apps. For example, most of the DiGAs (prescriptive eHealth in Germany) don’t have a “cockpit” function for physicians allowing them to monitor/support their patients.</p> <p>(5) The number of items per construct was unbalanced, i.e. 2 items (SI and FC) vs. 3 items (BI, PE, EE), please explain. Also, please provide measures of reliability or item-correlation as a precondition for summarizing scale scores.</p> <p>-----</p> <p>Results</p> <p>-----</p> <p>(7) You could add an effect size to the post-assessment group comparison (Cohen’s d around .30 would be a small effect).</p> <p>-----</p> <p>Discussion</p> <p>-----</p> <p>Overall, I liked to read the differentiated yet concise discussion of findings</p> <p>(8) With regard to the determinants of acceptance, experience with digital resources could be a strong predictor. Did you assess experience and could include this in your analysis? Otherwise, this could be discussed briefly.</p> <p>(9) A much more rigorous test of AFI’s would be not only with actual use/prescription of health apps but also with a larger interval between measurements since the short interval itself could have increased probability for significant change.</p> <p>-----</p> <p>Minor grammatical errors & spelling</p> <p>-----</p> <p>Figures: Use decimal points instead of commata. P.8 “Gender differences via Chi square test.” Word missing</p> |
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| REVIEWER | Lynn Webster PRA Health Sciences Utah |
| REVIEW RETURNED | 04-Jan-2022 |

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| GENERAL COMMENTS | <p>This reviewer appreciates the authors' efforts to show the level of acceptance for health apps used by people in pain and, perhaps, by their physicians. There is a paucity of this research regarding a burgeoning technology, so critical evaluations are necessary to understand what works and what doesn't work, and why.</p> <p>The study's intent seems clear, but this reviewer is confused about the design and results.</p> <p>There is a lack of description about what the apps are and what they do. Are they tools designed to measure patients' adherence to medication or a treatment plan? Or do the apps provide therapy to patients? If it's the latter, then what types of therapies are provided, and how often are the apps used? What type of monitoring do they offer and with what frequency? Please provide more detail about the apps.</p> |
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| | <p>Is there only one app, or are many apps used? The manuscript describes "apps," so it must be assumed that the study involves more than one app. What are the differences in the apps, and is there a difference in performance and acceptance depending on the app?</p> <p>The authors state that medical students demonstrated higher acceptance of the apps than the test group. Was there any assessment of how skilled the test group vs. medical students were in using these apps, specifically, or in using any apps, generally?</p> <p>Finally, what was the study population? Physicians or patients? If it was physicians, then how or why is the sample size of patients involved important? How many physicians were in each group? What were the demographics/experience levels with apps of the groups? Who was being evaluated? Were the authors measuring acceptance by the patients or by the physicians? Or both?</p> |
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| REVIEWER | Chantal Renella Lausanne University Hospital, Anesthesiology |
| REVIEW RETURNED | 31-Jan-2022 |

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| GENERAL COMMENTS | <p>This study focuses on barriers to the use of mobile applications for the treatment of chronic pain, targeting primary care doctors as well as medical students with a randomized parallel group educative web-based intervention to favor acceptance. The results indicate that brief educational videos may be an effective acceptance facilitating intervention for physicians and students alike.</p> <p>The study has a conceptual interest to better understand barriers/motivations to the use of e-health interventions. There are a few issues and limitations to address to further improve this work.</p> <p>Major</p> <ul style="list-style-type: none"> -The recruitment of physicians and students is not explained clearly. Who was invited? How? How many people were contacted to get the N answers? This is relevant to better understand how biased the replies were. -The figure 2 showing the two interventions should be translated from German. It is presented as screenshots from the videos. This does not feel as a very useful figure: it fails to explain much about the intervention (duration, depth of information provided), that could help to understand the intervention/control without having to read the supplementary materials. The video is presented in the discussion as "applied professional software to develop an appealing video that might be more convincing"... than prior efforts. The figure that is presented looks rather amateurish with mis-matched graphical sizes between the two panels. The contents with literature citations appears more convincing than the design, from what can be seen here. Therefore, I would suggest a revision of the figure, to make it more informative, and to revise the discussion on that topic. -Figure 3 /4 presents the results on acceptance/credibility for MD and students, without clarifying which is which. It would be helpful to clarify on the graphical representation which are the student and MD data. It is not clear why only these two measures are presented in graphical format. |
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| | <p>-The linear regression results could benefit from a table presentation or another form of illustration.</p> <p>-Discussion: “Accordingly, the low prescription rates (or the paucity of recommendations) of health apps by physicians could be partly attributable to their lack of credibility”. One missing factor in the discussion and investigation as such is the question of basic knowledge: have the doctors ever opened one of these apps? Do they know the name of one they could recommend? The intervention provides general information, which could prepare people to use such tools, but it’s so conceptual... if they do not know which app to prescribe, which ones are of value for which type of patient, their intentions are likely to go nowhere. The market is saturated with multiple tools and testing them is costly in time and energy. However, informing about specific tools might be seen as advertisement... these seem important points to raise and push the field forward.</p> <p>Minor: P. 6 “randomization was performed by the software used”: unclear. Was performed by the Unipark software? How? Blocks? Fully random?</p> <p>P6. Missing word: “Data collection was ?performed? between ...”</p> <p>Clarify in the methods: “With our medical student cohort, only the primary and secondary outcomes were assessed”. What was not assessed?</p> <p>Page 8: clarify the acronyms: “The CG watched a video providing general information about chronic pain (e.g., prevalence and costs for the health care system). The EG watched a video that discussed the content of health apps (e.g., how they can be used, and the results of recent studies).”</p> <p>Page 13: “performance expectancy has consistently proven to be one of the most important predictors of acceptance of new technologies” I would suggest avoiding “proven” and replace with “shown”, especially if only based on 2 studies.</p> |
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Severin Hennemann, University of Mainz

Comments to the Author:

Thank you for inviting me to review this interesting and valuable manuscript. The authors report on a pre-registered, randomized experimental trial studying the acceptance (i.e., behavioral intention) and its potential determinants of health apps in the context of chronic pain in a convenient sample of (mostly outpatient) physicians and medical students. The study is well-designed, theory-based, adequately powered and the reporting of findings is concise and well-structured. The study has important clinical implications concerning the implementation of mHealth in clinical practice and is likely to inform scientists and clinicians about the potential of AFIs. However, I see some room for improvements and outlined some suggestions below.

Thank you for your acknowledgment of our study and your valuable suggestions which helped to improve the manuscript. To make it more convenient for you to follow our revisions, we have highlighted all changes that relate to your comments in green in the marked manuscript. In addition, we have copied the changes into this document.

Introduction

(1) Most (freely) available apps for chronic pain cannot be recommended currently, as these lack scientific evaluation and have serious privacy issues, posing a potential threat to users, as concluded by a recent systematic review by Terhorst et al. 2021 (<https://doi.org/10.1016/j.invent.2021.100376>). Despite all the potential that the authors correctly point out, these limitations could be made clearer. Also, concrete evidence for the efficacy/effectiveness of mhealth for chronic pain (e.g., <https://doi.org/10.1093/pm/pnz164>, <https://doi.org/10.3390/jcm9113557>) could be added, since this forms an important basis for studying performance expectancy.

Thank you for your suggestions and interesting and up-to-date literature proposals. We have implemented your suggestions as follows:

Two recent meta-analyses conclude that pain apps can reduce patients' pain in the long term[10.3390/jcm9113557] and have positive effects on depression and pain catastrophizing[10.1093/pm/pnz164]. However, despite their positive potential, it should be mentioned that most pain apps have not been scientifically evaluated yet and privacy protection is often not sufficiently guaranteed[10.1016/j.invent.2021.100376]

Methods

(2) Please provide details on randomization (allocation ratio, block sizes) and (b) add information on the lengths of videos.

We have added the type of randomization and the length of the video:

The present study is a web-based experimental trial with a parallel-group design using simple randomization procedure.

The control group (CG) watched a video (3:10 minutes) [...] The experimental group (EG) watched a video (3:23 minutes) [...]

(3) The term “health apps”, which is used for the (UTAUT) items is perhaps too broad (e.g. could include communication, diagnosis, monitoring, intervention, etc.) and I wonder why you did not specify “apps for chronic pain (condition/patients)”? Did you cross-check, what the participants understood of “health apps”?

To make sure that participants understood health apps correctly, we provided a brief definition of chronic pain apps at the beginning of the survey. Further, we repeatedly explained that questions refer to apps for chronic pain. In order to be more precise we made the following correction:

Before starting the survey, we gave participants a brief definition of health apps and instructed them that all questions are related to health apps for chronic pain patients.

(4) Effort expectancy: I find the “user” perspective somewhat confusing since physicians would foremost prescribe apps. For example, most of the DiGAs (prescriptive eHealth in Germany) don’t have a “cockpit” function for physicians allowing them to monitor/support their patients.

We have based the items on similar previous studies and have omitted major changes for better comparability. Since the instructions specifically stated that the questions relate to the prescription of pain apps, we assume that the physicians understood them accordingly. Still, we think it would have been clearer to explicitly adapt the items in terms of prescription

We understand your confusion and hope that we have been able to clarify it with this answer.

(5) The number of items per construct was unbalanced, i.e. 2 items (SI and FC) vs. 3 items (BI, PE, EE), please explain. Also, please provide measures of reliability or item-correlation as a precondition for summarizing scale scores.

We applied the items of Baumeister and Ebert which were already used in former studies. To ensure comparability of the study results, we stayed with the original number of items.

Following your suggestion we have now added correlation (for SI and FC) and Cronbach’s alpha (for all other scales). Moreover, since the correlation was very low for FC, we have briefly addressed this in the discussion:

In addition, the scale facilitating conditions had low correlation measures, accordingly results of this scale should be interpreted with caution.

Results

(7) You could add an effect size to the post-assessment group comparison (Cohen’s d around .30 would be a small effect).

We think your suggestion makes sense and have reported the post-assessment group comparison:

Acceptance: *Group comparison of post-assessment data reveals a small effect (Cohen’s $d=.30$).*

PE: *Again, group comparison of post-assessment data reveals a small effect (Cohen’s $d=.28$).*

Credibility: *Post-assessment group comparison reveals a small to moderate effect for credibility (Cohen’s $d=.38$).*

Discussion

Overall, I liked to read the differentiated yet concise discussion of findings

Thank you.

(8) With regard to the determinants of acceptance, experience with digital resources could be a strong predictor. Did you assess experience and could include this in your analysis? Otherwise, this could be discussed briefly.

Unfortunately, we have not measured experience. However, we totally agree with your point and discussed it in our limitations:

Because of the survey's brevity, we could not collect many other potentially relevant constructs like technologization threat[47] or previous experience with health apps.

(9) A much more rigorous test of AFI's would be not only with actual use/prescription of health apps but also with a larger interval between measurements since the short interval itself could have increased probability for significant change.

We completely agree that a longer time interval would be even more informative. Due to our particular sample of busy and time-scarce physicians, we decided to keep the survey as short and feasible as possible. We have slightly changed our concluding sentence accordingly:

Future studies should examine the long-term effect of acceptance facilitating interventions and their impact on behavioral measures.

Minor grammatical errors & spelling

Figures: Use decimal points instead of commata.

Thank you. We have adjusted the graphics.

P.8 "Gender differences via Chi square test." Word missing

We corrected that.

Reviewer: 2

Dr. Lynn Webster, PRA Health Sciences Utah

Comments to the Author:

This reviewer appreciates the authors' efforts to show the level of acceptance for health apps used by people in pain and, perhaps, by their physicians. There is a paucity of this research regarding a burgeoning technology, so critical evaluations are necessary to understand what works and what doesn't work, and why.

The study's intent seems clear, but this reviewer is confused about the design and results.

Thank you for acknowledging our study!

We will try to answer your questions as best as we can. To make it convenient for you to follow our revisions, we have highlighted all the changes that relate to your comments in grey in the marked manuscript. In addition, we have copied the changes into this document.

There is a lack of description about what the apps are and what they do. Are they tools designed to measure patients' adherence to medication or a treatment plan? Or do the apps provide therapy to patients? If it's the latter, then what types of therapies are provided, and how often are the apps used? What type of monitoring do they offer and with what frequency? Please provide more detail about the apps.

Thank you for pointing this out. Due to the wide range of possible applications (e.g. diary, monitoring, intervention, etc.) a precise definition is difficult but we have now included a brief overview of possible functions of pain apps in the introduction:

Pain apps offer a wide range of application possibilities ranging from diary functions for monitoring pain to specific interventions.

Is there only one app, or are many apps used? The manuscript describes "apps," so it must be assumed that the study involves more than one app. What are the differences in the apps, and is there a difference in performance and acceptance depending on the app?

In our study we did not investigate acceptance of an specific app but we were interested in physicians' acceptance of health apps in the context of chronic pain in general to have more generalizable results.

The authors state that medical students demonstrated higher acceptance of the apps than the test group. Was there any assessment of how skilled the test group vs. medical students were in using these apps, specifically, or in using any apps, generally?

As the student sample was only an additional, secondary analysis we unfortunately have no more information about experiences and skills with apps.

To address your important comment anyway, we included it in our discussion:

This could be due to a generally higher level of skill and familiarity among the younger sample in using mobile technologies.

Finally, what was the study population? Physicians or patients? If it was physicians, then how or why is the sample size of patients involved important? How many physicians were in each group? What were the demographics/experience levels with apps of the groups? Who was

being evaluated? Were the authors measuring acceptance by the patients or by the physicians? Or both?

The study population were physicians mainly in an outpatient setting (N = 248; experimental group = 124, control group = 124) (see also Participants and Sample Characteristics in the study). We further assessed an additional sample of medical students (N = 101). We surveyed the acceptance of physicians because they play a gatekeeping role in recommending health apps to patients. Thus, no patients were involved in the study at all.

We hope to have answered all of your questions related to the manuscript.

Reviewer: 3

Prof. Chantal Renella, Lausanne University Hospital

Comments to the Author:

This study focuses on barriers to the use of mobile applications for the treatment of chronic pain, targeting primary care doctors as well as medical students with a randomized parallel group educative web-based intervention to favor acceptance.

The results indicate that brief educational videos may be an effective acceptance facilitating intervention for physicians and students alike.

The study has a conceptual interest to better understand barriers/motivations to the use of e-health interventions. There are a few issues and limitations to address to further improve this work.

Thank you for your critical and valuable review. To make it convenient for you to follow our revisions, we have highlighted all the changes that relate to your comments in turquoise in the marked manuscript. In addition, we have copied the changes into this document.

Major

-The recruitment of physicians and students is not explained clearly. Who was invited? How? How many people were contacted to get the N answers? This is relevant to better understand how biased the replies were.

We have now revised the information on recruitment in the manuscript.

Unfortunately, the number of students contacted is very difficult to estimate, as universities do not provide us with information on the number of their medical students. We estimate to have reached about 500-2000 students by email and facebook groups. However, since this is only a very rough estimate, we have left this part open.

We recruited physicians via email distribution lists, physician networks, and emails to practices. Due to the different recruitment methods, we can only estimate the number of physicians contacted. We assume that we reached approximately 10000 physicians, of whom 354 started the survey. The response rate is comparable to a similar study [33].

We additionally recruited a sample of 101 medical students via Facebook groups for medical students as well as email distribution lists of medical schools.

-The figure 2 showing the two interventions should be translated from German. It is presented as screenshots from the videos. This does not feel as a very useful figure: it fails to explain much about the intervention (duration, depth of information provided), that could help to understand the intervention/control without having to read the supplementary materials. The video is presented in the discussion as “applied professional software to develop an appealing video that might be more convincing”... than prior efforts. The figure that is presented looks rather amateurish with mis-matched graphical sizes between the two panels. The contents with literature citations appears more convincing than the design, from what can be seen here. Therefore, I would suggest a revision of the figure, to make it more informative, and to revise the discussion on that topic.

Thanks to your critical comment we hope that the interventions become clearer by now providing more details about the content of both videos under the Interventions section:

The control group (CG) watched a video (3:10 minutes) providing general information about chronic pain (e.g., prevalence and costs for the health care system and psychosocial consequences for people suffering from chronic pain). The experimental group (EG) watched a video (3:23 minutes) that discussed the content of health apps (e.g., how they can be used and the results of recent studies). We kept the information of both videos in simple language. In terms of content, the videos only gave a general overview of the topic without going into too much detail.

In addition, we have exchanged the images and added short explanations:

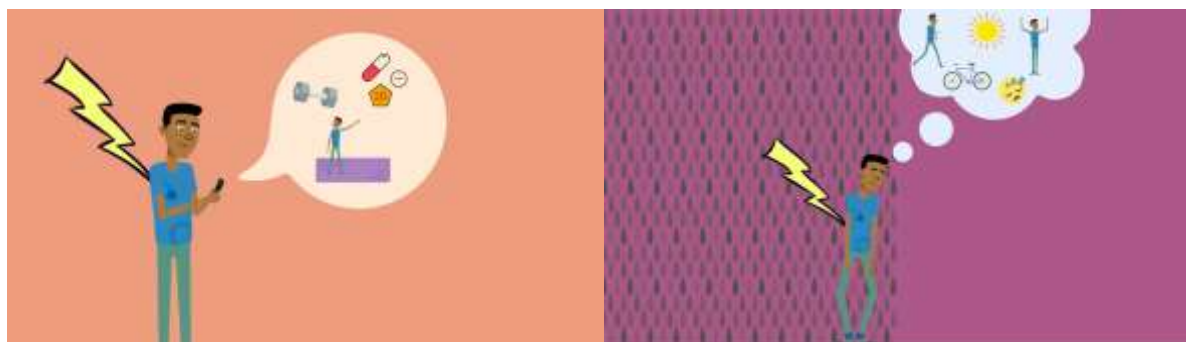


Figure 2 Screenshots of the video interventions. Left: Video of the EG describing possible applications of pain apps; Right: Video of the CG describing psychosocial consequences of chronic pain.

Moreover, we shortened and adapted the discussion as follows:

Our results indicate that brief, visually appealing educational videos may be an effective acceptance-facilitating intervention for physicians.

-Figure 3 /4 presents the results on acceptance/credibility for MD and students, without clarifying which is which. It would be helpful to clarify on the graphical representation which

are the student and MD data. It is not clear why only these two measures are presented in graphical format.

The description of the graphics was included at the end of the manuscript. We provide them to you below and hope this becomes clearer now:

Figure 3 Level of acceptance. Left: Physicians; Right: Medical students; EG=Experimental Group; CG=Control Group; pre=Measurement before the video; post=Measurement after the video; Error bars indicate standard errors; * $p < .05$; ** $p < .001$.

Figure 4 Level of credibility. Left: Physicians; Right: Medical students; EG=Experimental Group; CG=Control Group; pre=Measurement before the video; post=Measurement after the video; Error bars indicate standard errors; ** $p < .001$.

We chose to include acceptance, as this was our primary outcome. Instead of performance expectancy (replication of former results), we decided to present credibility, because this was one of the most interesting new findings. Due to formal restrictions (5 tables/graphs for the results section) of the journal we tried to keep it short. However, we are very open to change our graphics if you feel it will significantly improve our manuscript.

-The linear regression results could benefit from a table presentation or another form of illustration.

Overall, we agree with you that this part can be confusing because of the many numbers. However, we are concerned that another table or illustration with 13 predictors may reduce the clarity of the results section. Since the predictors from the second and third blocks are almost identical, we hoped that a purely textual presentation of the regression results might be sufficient. However, since we understand your comment, we have provided a table with the results of the third model as Supplementary Material. This allows interested readers to see the full data.

We are again very open to inserting a corresponding table or graph in the results section if you assume that this will not reduce the consistency of the results.

-Discussion: “Accordingly, the low prescription rates (or the paucity of recommendations) of health apps by physicians could be partly attributable to their lack of credibility”.

One missing factor in the discussion and investigation as such is the question of basic knowledge: have the doctors ever opened one of these apps? Do they know the name of one they could recommend? The intervention provides general information, which could prepare people to use such tools, but it’s so conceptual... if they do not know which app to prescribe, which ones are of value for which type of patient, their intentions are likely to go nowhere. The market is saturated with multiple tools and testing them is costly in time and energy. However, informing about specific tools might be seen as advertisement... these seem important points to raise and push the field forward.

We completely agree with you and added a new paragraph in the discussion, taking into account recommendations from current literature:

In addition to raising acceptance towards health apps, it is also important to provide physicians with specific recommendations on which apps are best to use with which patients. Due to the volume of the still growing market, it is hardly possible for an individual to get a profound overview of the range

of health apps available. It therefore seems sensible to establish guidelines for physicians about which apps can be helpful for which problems - just as there are guidelines for medications for diseases. To achieve this, a recent study suggests specific recommendations from medical associations or scientific societies, as well as specialized training in this field[66]. In this way, physicians could be helped to integrate health apps into their workflows[67].

Minor:

P. 6 “randomization was performed by the software used”: unclear. Was performed by the Unipark software? How? Blocks? Fully random?

We have added the information:

The present study is a web-based experimental trial with a parallel-group design using simple randomization procedure.

Randomization was performed within the Unipark software.

P6. Missing word: “Data collection was ?performed? between ...”

We have corrected it:

Data collection was performed between December 2020 and April 2021.

Clarify in the methods: “With our medical student cohort, only the primary and secondary outcomes were assessed”. What was not assessed?

For students we did not collect the predictors of acceptance. Since we assume that our wording could also confuse other readers, we have changed the passage as follows:

With our medical student cohort, only the primary and secondary outcomes were assessed, but not the predictors of acceptance.

Page 8: clarify the acronyms: “The CG watched a video providing general information about chronic pain (e.g., prevalence and costs for the health care system). The EG watched a video that discussed the content of health apps (e.g., how they can be used, and the results of recent studies).”

Thank you for pointing this out. We have corrected it accordingly:

The control group (CG) watched [...] The experimental group (EG) watched [...]

Page 13: “performance expectancy has consistently proven to be one of the most important predictors of acceptance of new technologies” I would suggest avoiding “proven” and replace with “shown”, especially if only based on 2 studies.

We have changed the text according to your suggestion and also think that the wording is now more appropriate.

VERSION 2 – REVIEW

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| REVIEWER | Severin Hennemann University of Mainz, Dep. of Clinical Psychology, Psychotherapy and Experimental Psychopathology |
| REVIEW RETURNED | 28-Feb-2022 |

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| GENERAL COMMENTS | <p>The authors have conscientiously revised the manuscript and further improved its quality. Some minor corrections remain to be addressed (see below), after which the manuscript could be considered eligible for publication in BMJ open.</p> <p>Re comment (1) Please add information on the magnitude of effects in previous RCTs on pain apps. Re comment (2) Please add allocation ratio (usually 1:1) and if known, the mechanism behind the randomization in Unipark. Re comment (3) The broad definition of pain apps remains problematic, and this was also pointed out by reviewer #2. I thus encourage you to discuss the possibility that participants could have interpreted various areas of application into the questions as a (major) limitation of this study (opposed to studying the acceptance for specific applications of pain apps). Re comment (5) The marginal correlation of FC items could be accounted for by cross-checking the regression model using single FC items. p. 12 “This could be due to a generally higher level of skill and familiarity among the younger sample in using mobile technologies.” Please check the literature, as to my view, being a (young) “digital native” may not correspond automatically with digital health competencies.</p> |
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| REVIEWER | Chantal Renella Lausanne University Hospital, Anesthesiology |
| REVIEW RETURNED | 25-Feb-2022 |

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| GENERAL COMMENTS | <p>Thank you for thoroughly taking into account my/the other reviewers comments. The manuscript is significantly improved. I would only still recommend to clarify ON figures 3/4 which graphs are representing the students and which the physicians. This avoids un-necessary searches in the legend. The legend could then be a bit more explicit on the results instead of listing what is where.</p> <p>One last improvement that is needed: different unfortunate typos have slipped into the new segments of text, please proofread attentively. (e.g. "We additional recruited").</p> |
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VERSION 2 – AUTHOR RESPONSE

Reviewer: 1

Dr. Severin Hennemann, University of Mainz

Comments to the Author:

The authors have conscientiously revised the manuscript and further improved its quality. Some minor corrections remain to be addressed (see below), after which the manuscript could be considered eligible for publication in BMJ open.

Thank you, for your valuable suggestions. As with the last review, we have highlighted the changes related to your comments in green in the marked manuscript.

Re comment (1) Please add information on the magnitude of effects in previous RCTs on pain apps.

We included the magnitude of the effects of the selected results of the two meta-analyses:

Two recent meta-analyses concluded that pain apps can reduce patients' pain by a small effect[23] and have a small positive effect on depression and short-term pain catastrophizing[24].

Re comment (2) Please add allocation ratio (usually 1:1) and if known, the mechanism behind the randomization in Unipark.

We have added the allocation ratio:

The present study is a web-based experimental trial with a parallel-group design using simple randomization procedure (1:1 allocation ratio).

Unfortunately, Unipark support could not help us with the exact randomization mechanism.

Re comment (3) The broad definition of pain apps remains problematic, and this was also pointed out by reviewer #2. I thus encourage you to discuss the possibility that participants could have interpreted various areas of application into the questions as a (major) limitation of this study (opposed to studying the acceptance for specific applications of pain apps).

We have clarified this limitation and taken into account your suggestion regarding the acceptance of specific pain apps. While we have kept the passage short, we have placed it at the beginning of the Limitations to give it more prominent space:

First, due to our broad definition of pain apps, participants may have assumed different usage scenarios for health apps. This could have influenced their acceptance. Accordingly, future studies could investigate attitudes toward specific apps e.g. psychological intervention apps.

Re comment (5) The marginal correlation of FC items could be accounted for by cross-checking the regression model using single FC items.

We checked that. There are marginal changes in the data, but they are very small and do not become significant.

p. 12 “This could be due to a generally higher level of skill and familiarity among the younger sample in using mobile technologies.” Please check the literature, as to my view, being a (young) “digital native” may not correspond automatically with digital health competencies.

We agree that younger age is not automatically related to digital health competencies. Still, we assume that young people on average have higher familiarity with regard to the use of mobile technologies (smartphones). However, we are aware that our wording could be misleading. Therefore, we have adjusted the part as follows:

Although young age does not automatically lead to higher digital health competencies[55], young professionals appear to be more receptive to interventions that promote the acceptance of health apps. This could be due to a generally higher familiarity of younger people in using smartphones and their preference for this medium for obtaining health information[56].

Reviewer: 3

Prof. Chantal Renella, Lausanne University Hospital

Comments to the Author:

Thank you for thoroughly taking into account my/the other reviewers comments. The manuscript is significantly improved.

Thank you.

I would only still recommend to clarify ON figures 3/4 which graphs are representing the students and which the physicians. This avoids un-necessary searches in the legend. The legend could then be a bit more explicit on the results instead of listing what is where.

We have adjusted the figures and legends according to your suggestion and hope that they are now easier to understand. Below you find a screenshot of figure 3 and the legend as an example (same changes were made to figure 4):

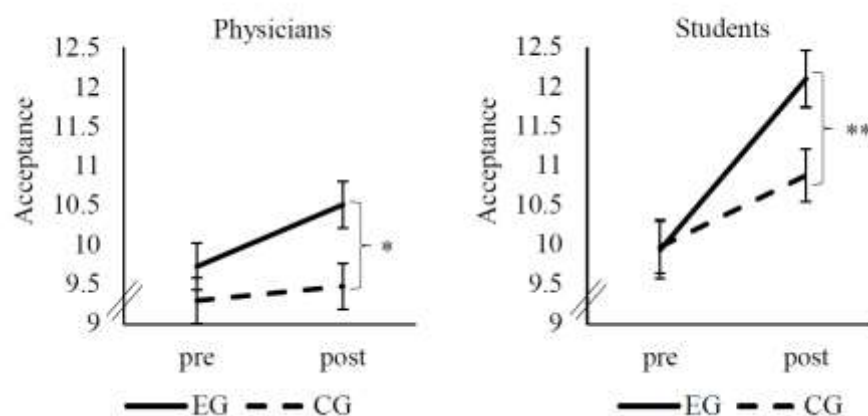


Figure 3 Change in acceptance. EG=Experimental Group; CG=Control Group; pre=measurement before the video; post=measurement after the video; Error bars indicate standard errors; * $p < .05$; ** $p < .005$.

One last improvement that is needed: different unfortunate typos have slipped into the new segments of text, please proofread attentively. (e.g. "We additional recruited").

Thank you for bringing the typos to our attention. All new sections were proofread again by us and a third person.