**Author’s response to reviews**

**Title:** Effects of media-assisted therapeutic approaches on physical activity of obese adults: A systematic review

**Authors:**

Alexandra Ziegeldorf (alexandra.ziegeldorf@uni-leipzig.de)

Hagen Wulff (hagen.wulff@uni-leipzig.de)

Petra Wagner (petra.wagner@uni-leipzig.de)

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**Author's response to reviews:**

The authors would like to thank the reviewers for their invaluable assistance and helpful comments. We noticed all annotations and revised the text accordingly. The reviewers support helps to improve the quality significantly.

Review Alia Ahmed, M.D., CCRP (Reviewer 1):

Comment 1:

“I would like to know more about aftercare (page 8, line # 149). Please mention with a little elaboration about the aftercare intervention strategies (page 4, line # 76, 77).”

Answer:

Thank you for that suggestion.

It is very difficult to define aftercare clearly. First, there are major differences in the health care systems all over the world and through this; there are different understandings about the definition and the content of aftercare.

This is also reflected in the studies. It was not possible to found an all over definition for aftercare because the studies see aftercare in connection with their own health care system.

In order to this, we revised the whole text regarding the terms. We decide to use the term “therapeutic approaches” to avoid ambiguity.

Selected and relevant strategies presented in the discussion.
Comment 2:

“What are the topics covered in telephone coaching (page 8, line # 155)?”

Answer:

Thank you for this note. You are right; it is useful and perhaps interesting to know more about the content of telephone coaching sessions. Therefore, we added more information about that in this section.

Old (Page 8, Line 154 – 157):

„In most cases expert advisors gave them individual feedback by email or supported them by telephone coaching regarding topics participants worked on, they answered questions and gave additional advice and information about the topics, if needed or requested.”

New (Page 8, Line 157 – 163):

„In most cases expert advisors gave them individual feedback by email or supported them by telephone coaching regarding topics participants worked on, they answered questions and gave additional advice and information about the topics, if needed or requested. Furthermore, coaching sessions on the phone focused on the request of behavior changes, discuss around barriers, successes and failures and advised patients about their action plan for the upcoming period [25].”

Comment 3 &amp; 4:

“I would like to know more about control groups ( page 9, line #172), perhaps in the method section.”

“How are the follow-ups scheduled for the participants?”

Answer:

We are grateful for this reference. We update the methods accordingly. Relevant facts about the control groups were implemented.

New (Page 5, Line 97ff.):

“Control groups were accepted if they get the same intervention without support of digital media or getting a slimmed-down version, getting the same intervention after the intervention group is
finished (waiting list), getting no support at all. In case of a waiting list control group, cut off criteria for inclusion was a maximum waiting time of 1 year.”

We also update the text with more specific advices in the text to the relevant tables to make it easier to find specific information about control groups and follow-ups.

Comment 5:

“To motivate participants or as a reminder tool, mainly used emails, text messages, and phone calls. Which one is the most effective to motivate participants?”

Answer:

This is an interesting point, thank you. To answer this, we scanned all included studies again. Unfortunately, it was not possible to find more specific information about how this tools effect the motivation of the participants. This is probably due because the measured outcome of the included studies was physical activity and not motivation. Consequently, we decided not to go deeper into this issue.

We totally agree that this issue is very interesting and should be considered in a future review.

Comment 6:

“The biggest potential was found in mixed approaches, combining digital devices and personal face to face support - this statement can be mentioned at conclusions also.”

Answer:

Thank you for this helpful statement. We agree and revised the conclusion.

Old (Page 16, Line 304ff.):

“Particularly younger generations live in a world full of technology. Various kinds of digital media are part of the daily life today. It seems only natural that media-assisted obesity treatment will increasingly become an integral part of obesity research and therapy [52].”

New (Page 17, Line 313ff.):

“In view of the increasing digitalization, it seems only natural that media-assisted obesity treatment will increasingly become an integral part of obesity research and therapy [52]. The evidence in this issue is still unclear. This review of 14 randomized controlled trials (RCT) showed the greatest potential for a therapeutical approach using digital media for supporting
obesity treatment in combination with a traditional face-to-face treatment. This result enhances already existing research in this field [55]. Nevertheless, major randomized controlled trials are necessary to identify effective methods for helping obese patients in the long term [53]. “

Review Rohana Ghani (Reviewer 2):

General comment:

“In general, this is a review on the effects of media therapy as part of treatment for obesity. In view of the fact that technology is so rapidly changing, the data presented here may not be reflective of the current trend.”

Answer:

Thank you very much for this comment. This is very helpful to clarify the abstract. According to your comment we revised the text as shown below:
Old (Page 2, Line 23ff):

“Media-assisted obesity treatment and aftercare seems to be contemporary and will increasingly become an integral part of obesity research and therapy. Nevertheless, available therapeutic personnel should further be used for inpatient obesity treatment and aftercare. In outpatient settings digital media could support the increase in physical activity.”

New (Page 2, Line 23ff):

„Therapeutic approaches using digital media for supporting obesity treatment did not show superior benefit over traditional personal therapeutic methods. Nevertheless, using both methods together offered the greatest potential for a successful obesity therapy.

Background

Comment 1:

“Line 39- "Energiebilanzmodell"- need to provide a translation of that German word.”

Answer:

Thank you for this hint. You are right, that this terminology is not selected very well and may confuse the reader.

The text has been modified as follows:

Old (P 3, Line 39-41):

“Based on the “Energiebilanzmodell”, one of the main reasons for overweight and obesity is low physical activity and high inactivity, (i.e. physical activity with decent intensity under the recommended 150 minutes/week) [4] [5].

New (P 3, Line 37-39):

“Main risk factors for overweight and obesity are low physical activity and high inactivity, (i.e. physical activity with decent intensity under the recommended 150 minutes/week) [4] [5].”

Comment 2:

“Useful to define what is 'aftercare'.”
Answer:

Thank you for that suggestion.

It is very difficult to define aftercare clearly. First, there are major differences in health care systems all over the world and through this; there are different understandings about the definition and the content of aftercare.

This is also reflected in the studies. It was not possible to found an all over definition for aftercare because the studies see aftercare in connection with their own health care system.

In order to this, we revised the whole text regarding these terms. We decided to use the term “therapeutic approaches” to avoid ambiguity.

Selected and relevant strategies are presented in the discussion.

Methods

Comment 1:

Unclear on the outcome measure in assessing the 'effect' of media-assisted therapy...

Answer:

We are grateful for this reference. We update the methods accordingly. Relevant facts about the outcome measuring and in addition relevant information about the control groups were implemented.

New (Page 5, Line 97ff.):

“Control groups were accepted if they get the same intervention without support of digital media or getting a slimmed-down version, getting the same intervention after the intervention group is finished (waiting list), getting no support at all. In case of a waiting list control group, cut off criteria for inclusion was a maximum waiting time of 1 year.

Outcome variable was physical activity. Measured parameters of physical activity behavior include duration (MVPA min/day), intensity (e.g. METs/week or kcal/day), frequency (number of training units per day or week) and volume (e.g. steps/day or week or total PA) [9].”

Results

Comment 1:
“Perhaps the authors could refer to specific studies in describing the methods rather than "One study..."”

Answer:

Thank you, reviewer, for tabling this proposal. The text (Page 8ff.) has been adjusted accordingly. Corresponding information about the specific studies are now placed right behind the described methods. In addition, some aspects have been named directly, e.g. Page 11, Line 205-206: “Only two studies recorded their effect size. Morgan et al. [40] report a moderate effect (Cohen’s d) and Ströbl et al. [41] report a small effect (ƞ²) [42].”

Comment 2:

“Line 189- What are the authors referring to as 'subjective measuring instruments'?”

Answer:

Thank you for your opinion.

Perhaps this terminology is confusing and not clear. We have revised this terminology to be more correct and clear (e.g. subjective measuring methods changed into self-reporting measuring methods)

Old (Page 9, Line 172ff.):

“Four studies used objective measuring tools like accelerometers (BodyMedia FIT System (Jawbone); Polar Electro Kempele Oy; ActiGraph GT1X; ActiGraph GT3X; Actigraph LLC) and pedometers (Yamax SW-200; WA101, Accusplit AE120). The majority of studies (10) used subjective measuring methods. Three of them used the International Physical Activity Questionnaire (IPAQ) [31], one of them the short form (IPAQ-SF) [32]. The remaining trials used the Seven-Day Physical Activity Recall Interview [33], the Paffenbarger Physical Activity Questionnaire [34], the Self-Reported Physical Activity and Screen Time Questionnaire [35], the Freiburg Questionnaire for Physical Activity [36], the Short Questionnaire to Assess Health-Enhancing Physical Activity (SQUASH) [37], the Beacke Physical Activity Questionnaire [38], and the Godin Leisure-Time Exercise Questionnaire [39]. One study did not specify the therein used subjective measuring instruments. Two studies used a combination of objective and subjective measuring instruments (table 3).

Newe (Page 10, Line 185ff.)

“Four studies used accelerometer based measuring tools (BodyMedia FIT System (Jawbone); Polar Electro Kempele Oy; ActiGraph GT1X; ActiGraph GT3X; Actigraph LLC) and pedometer based measuring tools (Yamax SW-200; WA101, Accusplit AE120). The majority of studies
(10) used self-reporting measuring methods. Three of them used the International Physical Activity Questionnaire (IPAQ) [31], one of them the short form (IPAQ-SF) [32]. The remaining trials used the Seven-Day Physical Activity Recall Interview [33], the Paffenbarger Physical Activity Questionnaire [34], the Self-Reported Physical Activity and Screen Time Questionnaire [35], the Freiburg Questionnaire for Physical Activity [36], the Short Questionnaire to Assess Health-Enhancing Physical Activity (SQUASH) [37], the Beacke Physical Activity Questionnaire [38], and the Godin Leisure-Time Exercise Questionnaire [39]. One study did not specify the therein used self-reporting instruments [27]. Two studies used a combination of accelerometer based and self-reporting instruments [27], [53] (table 3).

Comment 3:

“Overall, the results are presented as the different tools and measurements used. It is unclear on what are the outcome measurements used to determine the effects of the media-assisted therapy on the study population.

Eg, weight loss in kg or percentage weight loss, physical activity in kJ or duration of exercise, other laboratory or metabolic parameters”

Answer:

Thank you for this suggestion for improvement. We add the main information about this in the text as followed:

New (Page 6, Line 102ff.):

„Outcome variable was physical activity. Measured parameters of physical activity behavior include duration (MVPA min/day), intensity (e.g. METs/week or kcal/day), frequency (number of training units per day or week) and volume (e.g. steps/day or week or total PA) [9].”

Comment 4:

„Tabelle 3 (please correct)- is unclear- what does (1/2) mean?

Results should be presented in more details rather than with arrows.”

Answer:

Thank you for this note.

We changed the design of table 3 to make it more clearly. Accordingly, we have revised table 3 and split the intervention groups in two separate table columns (see page 11f.).
We also tried to show the facts and results as clear and easy as possible to provide a high level of transparency and comprehensibility. For more specific and detailed results we'll need to add some more statistical parameters. In our opinion, this would make the table confusing. For this purpose and because of the large number of studies included we decided to stay with this type of illustration. By detailed listing of the studies, it is simple for interested readers and researchers to find these and get more specific information.

Discussion

Comment 1:

“The statements are too general. It would be useful to discuss around the results presented above ie- what are you referring to as 'level of physical activity in the intervention groups increased...'

Similarly, would be useful to refer to the studies specifically eg Cussler et al rather than 'One of those studies...’”

Answer:

Thank you for this helpful note. We revised the section to clear the statement. Regarding to the reporting guidelines upon which we are oriented, the detailed presentation of the results is placed in the “results” section, mainly in table 3 and the text. In the discussion section, we just give a short conclusion of the main results but mainly try to classify and evaluate our findings. For this purpose, we decided not to repeat the whole results again in detail.

Old (Page 13, Line 244 – 246):

“The level of physical activity in the intervention groups increased in eleven trials. Comparable results can be found for the control groups (10 trials)

New (Page 14, Line 252– 255):

“Physical activity in the intervention groups, measured by either duration, intensity, frequency or volume, increased in eleven trials and decreased in the other three trails. Comparable results can be found for the control groups (see table 3).”

Comment 2 &amp; 3:

“Line 275- In outpatient setting.... unclear on which study or result this discussion is based on.”

“Line 286- In rural areas.... unclear on which study or result this discussion is based on.”
Answer:

Good point, thank you, we did not realize that.

We supplemented relevant studies at the mentioned sections. Additional literature has been added. See Page 15f., Line 284-298.

Comment 4:

“Line 298- 'From an economic perspective..' Perhaps this was not covered within the scope of this review thus may not be appropriate to be included in the discussion.”

Answer:

Thank you for your valued opinion. From our point, the economic perspective in particular in this context is interesting and important mainly for professionals in this setting. Not least in view of the background of the enormous rising costs and increasing privatization in our healthcare system. We tried to be very brief with this point (just two sentences) but in our minds, this is still an important point which needs to be addressed also to point out advantages and disadvantages of digital media usage in a therapeutic domain. This point seems also very interesting and important for the health care and therapeutic treatment in rural regions, especially in the future.

Comment 5:

“Grammatical errors to be corrected.”

Answer:

Thank you for mentioning this. We apologize for existing grammatical errors. In the course of the revision a professional English-speaking proofreader reviewed the text.

Conclusion

Comment 1:

“The conclusion does not reflect the content of the review.”

Answer:

Thank you for this helpful statement. We agree and revised the conclusion.

Old (Page 16, Line 304 - 314):
“Particularly younger generations live in a world full of technology. Various kinds of digital media are part of the daily life today. It seems only natural that media-assisted obesity treatment will increasingly become an integral part of obesity research and therapy [52].

Major randomized controlled trials are necessary to identify effective methods for helping obese patients in the long term [53]. Existing studies provide initial indications on how to achieve intervention objectives and increase physical activity by using digital media. Through this, it is possible to implement efficient and resource-conserving concepts of intervention for both, the healthcare system and patients in the future. In order to build on existing success, adequate evaluation and further development of media-assisted obesity treatment and aftercare is required.”

New (Page 17, Line 313 - 325):

“In view of the increasing digitalization, it seems only natural that media-assisted obesity treatment will increasingly become an integral part of obesity research and therapy [52]. The evidence in this issue is still unclear. This review of 14 randomized controlled trials (RCT) showed the greatest potential for a therapeutical approach using digital media for supporting obesity treatment in combination with a traditional face-to-face treatment. This result enhances already existing research in this field [55]. Nevertheless, major randomized controlled trials are necessary to identify effective methods for helping obese patients in the long term [53]. Existing studies provide initial indications on how to achieve intervention objectives and increase physical activity by using digital media. Through this, it is possible to implement efficient and resource-conserving concepts of intervention for both, the healthcare system and patients in the future. In order to build on existing success, adequate evaluation and further development of media-assisted obesity treatment and aftercare is required.”