Author’s response to reviews

Title: Effectiveness of PUSH notifications from a mobile app for improving the body composition of overweight or obese women. A protocol of a three-armed randomized controlled trial.

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Author’s response to reviews:

Dear Sirs:

First, we would like to thank the Editor and reviewers the time dedicated to revising the manuscript, their assessments and all the comments made on this work. We agree with most of the observations and are convinced that their contributions have gone towards improving the clarity and scientific value of this research. We apologize for the errors and we have corrected the text as suggested.

To make the changes easier to understand, we have including, when possible, the revised texts in the manuscript as a part of the answers to your comments. We attached the modified version via the web platform.

The authors.
Editor Comments:

I'm afraid the quality of the English used throughout your manuscript does not currently meet our requirements. We recommend that you ask a native English speaking colleague to help you copyedit the paper. If this is not possible, you may need to use a professional language editing service.

RESPONSE EDITOR COMMENTS

We regret the inconvenience caused due to the quality of the translation of the text. It is not usual, and perhaps the original theme has been able to take our translator to perform a low-quality work. We have proceeded to rewrite the text in its entirety, from start to finish. We hope that its quality is adequate

Reviewer reports:

Ping Yu (Reviewer 1)

A.1. Abstract section. The last sentence in the background section is not clear. the aim of the paper is not well defined.

RESPONSE A.1 (line 43-50)

“The primary outcome (obese adult women) will be assessed according to age, fitness status, weight, and body composition status. Data will be collected at enrollment and weekly during 6 months of intervention on dietary practices, physical activity, anthropometry, and body composition. Analysis of effect will be performed comparing the outcomes between intervention and control arms. The study resulted in a comprehensive mHealth nutrition and lifestyle package and completed recruitment and baseline assessment of participants. The message delivery is in progress.”

We agree with your comment regarding the development in the text of the aim of the study. We have rewritten this section. (Line 158-166)
“In this study, we aim to investigate whether mHealth that included text messages via PUSH notifications containing advice for dietary and lifestyle modifications for six months would reduce the percentage of total body fat among overweight or obese women adults aged 25–64 years in a predominantly urban Southern Spain population. The study also aims to evaluate the effects of the mHealth intervention on body mass index, dietary practices, and physical activity. As an initial hypothesis, we considered that those subjects assigned to the group receiving the PUSH notifications would adhere to the dietary recommendations and physical activity proposed, thus achieving a more significant fat loss and a higher increase in muscle mass.”

A.2 Page 2. Highlights section. The first sentence is not clear. The message of the highlights is difficult to understand as the context of the statements is not set up.

RESPONSE A.2

We have decided to eliminate the section dedicated to "highlights" as it is not a requirement of the journal.

A.3 Page 4. Example of shifting the subject of conversation: The first sentence starts with 'The use of mobile technology', presumably by human, then 'and its presence' shifts the subject to mobile technology. This is confusing for audience to anticipate what the story is about.

RESPONSE A.3

We have changed the structure of a sentence, but we have maintained the original idea. We have deleted the phrase mentioned by the reviewer.

A.4 Line 18-19. 'all the strata', bad choice of word.

RESPONSE A.4

We have corrected the sentence and it is finally in the text as follows: “…has signified an authentic social and cultural revolution, reaching all the levels of society.”
A.5 Page 4. Line 96. The first sentence is over-stated.

RESPONSE A.5

Thanks for this comment. We agree with it and have chosen to delete this sentence.

A.6 Page 5. Line 103-110. SMS's is colloquial presentation, not suitable for scientific writing.

RESPONSE A.6

Thanks for this comment. We regret this option chosen first. We have modified it in the text, finally being as follows: "Different strategies, going from phone calls or sending information through the Short Message Service (SMS), up to the use of applications such as those for clinical decision-making support or telemedicine, have shown themselves to be effective in the communication between patients and health professionals; the change toward healthy lifestyles (giving up smoking or increasing physical exercise); in the improvement of illness management (in diabetes or asthma, for instance); and in the increase in adherence to the treatments” [12-15].

A.7 Line 29 to 54. The difference between mobile and SMS message is not substantiated. The evidence provided is not convincing.

RESPONSE A.7

Thanks for this comment. We have rewritten this paragraph and updated the references. We hope that this time the information will be more convincing.

“Communication Technology has evolved, leading us from making phone calls or sending text messages through Short Message Service (SMS) to develop telemedicine using webs or apps, as support in clinical decision making or increasing the degree of adherence to treatments [7-9]. SMS has demonstrated to be a great resource to deliver electronic reminders in practice and a very feasible platform (since this technology is old and therefore can be delivered to any existing mobile telephone), showing clear benefits increasing adherence to treatment [10], preventing complications in chronic conditions [11], allowing communication between professional [12], helping in disease self-management [13], etc. In these experiences, SMS has been used alone [11,12] or in combination with other technologies [13,14].
However, PUSH technology has recently emerged in mHealth sector because of its potential for improving pervasive functionalities in mobile health apps, allowing to deliver timely updates and customized reminders to their users in relation to the time of sending, as well as to the content. Push notification is defined as an event-based mechanism where remote servers push events to smartphone client apps [15]. This functionality offers auditory and visual alerts to inform the user about a received message and invite him/her to act, even without needing to be the app being used [16]. PUSH notifications have proven to be effective in communication with professionals [17] and assessing patterns health behaviors [18], but there is scarce evidence of its effectiveness in interventions aimed to changes in lifestyles.”

A.8 Page 6. Lines 1 to 13. The words used are colloquial, not suitable for scientific writing, such as Line 2. 'improves the results obtained'. It is not clear what the results are. 'on the health status' has changed the topic from digital tool to human.

The terms used are random, lacking consistency. This makes it difficult to follow.

RESPONSE A.8 (line 137-142)

Thanks for this comment. We regret the level of language used. We have modified this paragraph: “Interventions that use mobile and portable technologies can be useful in improving healthy habits or reducing high levels of sedentary behavior [18-19]. It has been demonstrated that certain functions implicit in the habitual use of Smartphones, like the exchanging of information, the possibility of carrying out self-monitoring with natural, intuitive record systems, the interaction between users, or the employment of gamification strategies, also have positive effects on the health status [20].”

A.9 Page 6.

A.9.1 Line 24 'health parameters' is not appropriate here.

A.9.2 Lines 29 to 53. Difficult to follow.
RESPONSE A.9.1

Thanks for this comment. We have rewritten this sentence: “Besides, the users should feel that they are part of the technology, it is especially important to involve patients in active commitments, like self-control in certain behaviours, or making timely follow-ups. These measures have been seen to be efficacious in improving health markers.”

RESPONSE A.9.2

Thank you for this comment, we agree with it. We have completely restructured the indicated paragraph. (Line 148-157)

“The objective of a large part of the health interventions based on the use of APPs has been to improve nutritional status through dietary advice and an increase in physical activity (PA) [31]. In this sense, it has become evident that an increase in PA implies benefits to health and reduces mortality from all causes, regardless of the body mass index (BMI) [32]. Also, there is ample evidence of the role of PA in weight loss programs in the long-term prevention of recovering weight loss [33]. In past years, systematic reviews have been done in order to establish associations between physical activity and weight loss in overweight or obese individuals [34-35], demonstrating the existence of an inverse association between the physical activity carried out and the BMI.”

A.10 The rough writings:


LINE 1: Thanks for this comment. We have modified this text in its entirety.
LINE 23-24: Thanks for this comment. We have modified this text in its entirety

A.10.2 Page 8 Lines 189-194.
“...: The women with the following pathologies or special situations will be excluded from the study: Type 2 Diabetes, being or trying to become pregnant, being in a maternal lactation period, suffering from kidney failure, being underage, presenting a healthy weight (BMI \leq 25) or receiving pharmacological antidepressant treatment. Further, those women not possessing a Smartphone with an operating system (Android or iOS) and available data connection did not participate in the study.”

A.10.3 Unclear presentation due to lack of definition.

Page 8 Line 30 'being sedentary'.

RESPONSE A.10.3.

Thanks again for the comment. We have extended the text, including definition and reference. (196-200)

“Also, with the aim of homogenizing the study population, the inclusion criteria are: having a body fat percentage of \geq 30\%, being sedentary, defined as low energy sitting (or reclining) during waking hours [37], and not having been submitted to a restrictive diet in the 6 months prior to the beginning of the study.”

A.11 Page 8. Push notification. The final decision of pushing out the message is not in accordance with the reasons given.

RESPONSE A.11. (Line 204-223)

We agree with this comment. We understand that it is a critical part of the protocol, and we have extended the text and explanation of it. We hope we have explained this point better.
“Figure 2 shows the implementation of the PUSH notifications in the study design. Automatic PUSH notifications will be scheduled to be sent on specific days, or not, with personalized health and motivation messages, which will be aimed to provide comments for reinforcing behavior modification and encouraging interaction with the APP. These comments will be based on the following behavioral theories:

- Health tips, where the primary tailoring goals are: attention and peripheral processing [28]

- Physical Activity Tips, in this case: attention and being informed [29]

- Self-monitoring tips, where the primary tailoring goals are: decision making and behavioral intention [30]

Three specific times will be established throughout the day for the sending of messages. According to previous works [29-30], the best time for sending PUSH notifications will depend on: a) when patients are able to fix their preferred time for receiving them, b) trying to deliver them at times that do not interrupt the daily routine (notifications will be more effective) [31]. For these reasons, it has been determined that the best adherence will be achieved at the times of day at which there are no commitments (before work, during lunch, before supper), so we fixed for 8.30 a.m. (point 1), 14.00 p.m. (point 2) and 20.00 p.m. (point 3). The first message will be sent between points 1 and 2, and those users who do not answer it again receive an automated notification in point 3.”

A.12 The diagrams are not clear.

RESPONSE A.12

Thanks for this comment. We agree that the diagrams can be better explained. We have reviewed:

- Figure 2. Implementation of the PUSH notifications in the study design.

- Figure 4. PUSH notifications architecture.

Both figures explain the technological development of the protocol. We have added in the image an explanation of what each process is.

We hope this review is convenient