

## Peer Review File

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### Reviewer A

Line 33:

Comment 1 : what is the definition of m-apps? I presume mobile apps, but the authors might want to be more specific the first time they use this term.

Reply 1 [we give more details in the revised version](#)

Changes in the text: [Few medical applications \(mobile apps and/or web-app\) ...](#)

Comment 2: line 34

Few of m-apps for hypertension can be regarded as accurate and safe for clinical use and to date, we do not have high quality evidence to determine the overall effect of smartphone apps on BP control.-not clear

Reply 2 [we used the term “of the use” to be clearer](#)

Changes in the text: Few [medical](#) apps for hypertension can be regarded as accurate and safe 34 for clinical use and to date, we do not have high quality evidence to determine the overall effect [of the use](#) of smartphone apps on BP control.

Line 48:

Comment : the authors address the possible advantages of HBPM. Are there any disadvantages that need to be addressed?

Reply 1 [Yes, there are. We add the precision in the revised text :](#)

Changes in the text: HBPM has been shown to detect white coat hypertension and masked hypertension, is the preferred method for patients, and there are many reliable, inexpensive, and easy-to-use measuring devices available. [An example of a disadvantage is that some patients make mistakes during their home measurements \(primarily due to lack of patient training by healthcare providers\), in practice, HBPM is widely recommended by all the scientific societies.](#)

Line 68-72:

Comment : a distinction must be made between different purposes for blood pressure measurement, which are explained. Can the authors elaborate why this distinction is important? Are NICTS better suited for certain purposes?

Reply 1 : [we give more details in the revised version](#)

Changes in the text:

A distinction must be made between transmissions of BP values initiated by healthcare professionals, patients or healthcare consumers. One should not confuse one-off analyses in a medical emergency (in this context BP is a “vital sign”) and long-term monitoring of BP as a chronic cardiovascular risk factor.

In the first case, the clinician's analysis is based on a single measurement, (for example a BP measurement to assess the severity of a haemorrhage); in the second, the medical reasoning must take into account the evolution of many blood pressure readings, either over 24 hours (ambulatory blood pressure monitoring, ABPM) or over several days (HBPM). For the long-term follow-up, new technologies have the advantage of keeping a precise history of data with the possibility of algorithmic processing to show its evolution over time.

Line 72-73:

Comment : what is the purpose of this review?

Reply 1 : we answer to this question in the revised version

Changes in the text:

The present review is focused on the long-term monitoring of hypertensive patients. It describes the care pathway in distinguishing the medical situations of self-management and telemonitoring, the differences of which imply a different use of NITCs.

Line 84:

Comment 1: it is not given that patients have to purchase the blood pressure monitors their selves. They could also lend the monitor from the hospital. Nevertheless, guidance must be given in the choice and use of a certain blood pressure monitor.

Reply 1 We agree with this remark. We think the lines 85 and 86 already respond to this. We changed the phrasing by using “in most cases” and “buy”

“In most cases, patients buy the HBPM device (in pharmacies, department stores or on the internet) by themselves. Consequently, healthcare professionals must guide the patients’ choice towards validated BP monitors ....”

Line 96:

Comment 1 : in line 96-98 the authors refer to Table 1 for devices that wrongly claim to be validated, but Table 1 shows different groups of blood pressure monitors.

Reply 1 We agree with this remark, and we moved the reference to the table just above

Comment Table 1:

Comment 1 what is the difference between an automated oscillometric wireless device and a wireless smartphone application paired with an external wireless blood pressure monitor? It is nice to provide an overview of different groups of blood pressure monitors, but I find Table 1 confusing. Can the authors provide an overview of blood pressure monitors in which the differences between the groups are more distinct?

Reply 1 We add in Tabl 1 the word **oscillometric**

### Change in the table 1

Wireless smartphone applications (paired with an external <b>oscillometric</b> wireless BP monitor or turning the smartphone into a cuffless BPM device (fingerprint, wrist, face))
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Reply 1 **OK we add a tabl**

Line 157-161:

Comment 1: do the authors think a difference in SBP of -3.4 mmHg and DBP of -0.5 mmHg is clinically significant?

Reply 1 We already gave an precision to this question in the text line 165 by the adjective “moderate”. But to be more clear we add this additional remark: The SBP reduction is clinically interesting

Changes in the text:

In the HOME BP study after one year, mean values of BP decreased from 151.7/86.4 158 to 138.4/80.2 mmHg in the intervention group and from 151.6/85.3 to 141.8/79.8 159 mmHg in the usual care group, giving a mean difference in SBP of -3.4 mmHg (95% confidence interval -6.1 to -0.8 mmHg) and of -0.5 mm Hg (-1.9 to 0.9 mmHg) in DBP [12]. **The SBP reduction is clinically interesting.**

Line 163-164:

Comment 1 what do the authors mean with this statement? That home blood pressure measurement is not ready to be called innovative ? In this paragraph they explain why the level of evidence is low, but that does not automatically mean that home blood pressure measurement is not innovative.

Reply 1 : We agree with the reviewer, the use of the word innovative is not clear in our text. To explain what we mean by "innovative" would require an... editorial. To be pragmatic, it therefore seems simpler to remove this term from the current text.

Changes in the text:

The HBPM should not be overvalued, ~~that it is linked to a technical environment readily qualified as “innovative”.~~ In reality, the level of evidence (strength of evidence) for the BP reduction is “moderate”.

Line 169-172:

Comment 1 : despite it being most probably true, do the authors have literature to support these statements?

Reply 1 We add the reference 8 (this paper quotes 5 references on this topic). As it is not the main subject of our work, we chose to quote the article 8 only.

Line 179-182:

Comment 1 : the way the authors have described this example is likely to be misinterpreted. Of the 11399 contacted patients 1010 patients did not respond or did not want to participate. Of these 1010 patients the mean age was 73 years and only 2426 (24%) responded why they did not want to

participate. 41% of 2426 patients did not have access to the internet and 22% did not want to change treatment. Nowadays most people have access to the internet, especially a younger population.

Reply 1 : Yes, most the younger population have access to the internet, but hypertension mainly affects older people (> 60 to 65 years old). In this age studies show that digital literacy (and not just internet access) is often low. Hoping you accept this response we do not change the text.

Line 193-194:

Comment 1 : the authors could consider labeling the patient not only as male but plural: make their own decision.

Reply 1 : Thank you for this remark, we have corrected it.

Changes in the text:

After having measured the BP (compliant or not) the patients are free to make their own decisions (for the better or for the worse).

Line 204-211:

Comment 1 : because of language barrier I can not validate the literature reference. Is this pyramid created by the authors?

Reply 1 : Yes, the pyramid was created by the authors.

Comment 1 : I don't know if a patient self-diagnosis, self-treatment and adjustment of medication for the treatment of hypertension is desirable. A collaboration between the patient and doctor may be more desirable. How exactly should this pyramid be used?

Reply 1 . For selected patients, self-diagnosis, self-treatment and adjustment of medication may be useful as some studies have demonstrated. These possible options are accepted by the latest ESH statement (8). To answer the reviewer and to be clearer we add precisions and we correct the fig 1 by changing the order of the tasks (bottom to top and no top to bottom)

Changes in the text:

This patient activation needs to assess a patient's acceptance and ability to engage with self-management. This approach presupposes the prior acquisition of skills, the level of which must be adapted to the level of health literacy of each patient. It's not one size fits all. For patient education by health care providers, we propose a skill pyramid which includes 7 levels (Figure 1) [14]. Level 1 at the base of the pyramid corresponds to the simplest task, level 7 to that reserved only for autonomous patients who have acquired the previous stages. It is only with them that self-medication adjustment can be offered. To reach the next level, the patient must fully understand the precedent step.

Line 293-295:

Comment 1 what do the authors mean with these lines? What is de self-decision support tool? Carry out real-life studies with healthcare consumers to assess the impact of the “self-decision support tool” (NB: the expression is mine derived from the clinical decision tool);

Reply 1 We agree with the reviewer; our expression is unclear. We replace it by “self-management tool”

Changes in the text:

Clinicians show robust evidence with blinded, prospective randomized clinical trials addressing the role of mHealth strategies for BP, focusing on hard outcomes over longer follow up times. Carry out real-life studies with healthcare consumers to assess the impact of the “~~self-decision support tool~~” (NB: ~~the expression is mine; derived from the clinical decision tool~~); **self-management tool**

Line 304-311:

Comment 1 NICTS have a real opportunity to improve the management of hypertension, but there are still some problems unresolved. In my opinion there are stronger arguments earlier in this manuscript than the arguments that are used in this paragraph. Also, English grammar should be improved.

Reply 1 we rephrase all the paragraph

Change in the Text : The potential advantages of NTIC constitute a real opportunity to improve the management of hypertension. However, it is difficult to estimate the time needed for this hope to become a reality accessible to most patients. Apart from the scientific evidence that remains to be provided by medical specialists, society as a whole and not just health professionals and patients, must overcome resistance to change. This evolution may take a generation or more to occur. Let's take two examples: will doctors who are used to seeing patients face to face during their consultations agree to skip this human interaction in order to sit in front of a screen and simultaneously process the data of hundreds of patients? What degree of confidence will patients place in algorithms that make certain decisions in their place or in place of their doctor ?

Comment 1

And finally, can the authors give readers an advice or take home message based on this review?

Reply : we agree

Change in text : we add the tab. 2

**Table 2.** Take home messages

- HBPM is widely recommended by all the scientific societies
- The use of NICTs has different organizational implications depending on the medical context
- Too many App are designed by engineers without any collaboration with the healthcare professionals
- Many Direct-to-consumer BP connected device are not suitable for medical decision-making,
- With The home BP telemonitoring (HBPT) the physicians decides when to initiate and stop the procedure and remains the author of medical decisions
- Digital interventions (apps, programs, or software used in healthcare) have the potential to support people in self-management.
- Self-management presupposes the prior acquisition of skills, the level of which must be adapted to the level of health literacy of each patient.

## Reviewer B

Comment 2: This is an interesting paper. For English, scientific writing it needs review and corrections. There are multiple occasions where the text construction is unclear or awkward. The wording which needs improvement includes these examples: 29 control rates. The level of evidence for the drop in BP is “moderate”-unclear language- use decrease in blood pressure or BP lowering.

Reply 2 : A native English speaker reviewed the new version of the article and corrected certain elements and removed the awkward phrasing.

37 Comment 2: Keywords: clinical decision support systems internet; awkward

Reply : we remove the keyword : “clinical decision support systems internet”

45 Comment 2: to the New Information & Communications technologies (NICTs) but also to its 46 intrinsic qualities.-this is not cited as the source of the term

Reply : we rephrase :

Change in the text :

Home BloodPressure Monitoring (HBPM) is becoming the cornerstone of the management of arterial hypertension using telemedicine or mobile health because it combines the advantages of its intrinsic qualities to that of the New Information & Communications technologies (NICTs)

108 Comment 2:

The transmission of BP data can be done using various techniques. Some are adapted to the use of conventional BP monitors, which remains predominant today: this is the case of websites with dedicated forms allowing manual data input or manual upload of 111 files.-awkward

Reply : we rephrase :

Change in the text :

The transmission of BP data can be done using various techniques. Some are adapted to the use of conventional BP monitors, which still remains predominant today: This is the case of websites with dedicated forms allowing manual data input of BP readings.

123 Comment 2:

The home BP telemonitoring (HBPT) is the remote transmission of BP values, 124 measured at home and transmitted to the doctor’s office or hospital, by means of 125 telehealth strategies. Once the data is received at the central telemedicine server, they 126 are stored, analyzed and then reviewed by a healthcare professional. \*data are plural\*\*use clinicians since other than “doctors”use these tools for care

Reply: Ok we changed data and healthcare professional to the plural form, and we removed doctor for clinician

Change in the text :

The home BP telemonitoring (HBPT) is the remote transmission of BP values, measured at home and transmitted to the doctor's office or hospital, by means of 125 telehealth strategies. Once all the data are received at the central telemedicine server, they 126 are stored, analyzed and then reviewed by healthcare professionals.

128 Comment 2: In this context, the main principles of the patient-doctor consultation relationship (usual 129 care) are maintained: the doctor decides when to initiate and stop the procedure-replace doctor

Reply: we changed the text; replacing the word "doctor" for "clinician"

128 Comment 2:

In this context, the main principles of the patient-clinician consultation relationship (usual care) are maintained: the doctor decides when to initiate and stop the procedure-replace doctor

163 Comment 2:

The HBPM should not be overvalued, that it is linked to a technical environment readily 164 qualified as "innovative"-awkward

Reply: The reviewer 1 made the same remark and we changed the wording, (see above)

192 Comment 2:

professionals because they own their health data and are not subject to professional 193 secrecy).\*secrecy is difficult choice of words here\*

Reply: We changed the text; Replacing secrecy by confidentiality

199 Comment 2: To avoid bad practices, the doctor must supervise the Self-management approach \*\*self not Self\*\* clinicians

Reply: Yes we deleted the capital "S"

309 Comment 2: example, will doctors who have a traditional activity of face-to-face consultation agree 310 to process data from hundreds of patients simultaneously? How much confidence will 311 patients have in the algorithms?-awkward

Reply:

Reviewer 1 made the same remark and we changed the all wording of the paragraph (see above)