

Appendix D. Usability of the Self-Monitoring Devices given in the BOX at the Leiden Medical University Centre (LUMC)

This report contains the guidelines to evaluate the usability and acceptability of the self-monitoring devices given to patients with MI at the LUMC. The devices are:

- 1 blood pressure monitor (BPM). Company Nokia Withings. Medical device.
- 1 smart watch with a pedometer. Company Nokia Withings.
- 1 weight scale. Company Nokia Withings.
- 1 two leads ECG monitor. Company Alivecor. Medical device.

The products are given in a box, hence the name of the project, "The Box". All of them require the usage of a mobile device altogether with the applications to use them. These applications are the Nokia Healthmate App for the Nokia devices and Kardia App for the ECG monitor from Alivecor. Patients are proposed to use the Box to self-monitor their vitals during one year after the heart attack, if they agree, they are given the products. A technician from the LUMC helps them to set-up the devices and gives instructions on how to use them. Resources such as articles and video instructions are available and further support is given if required.

Background

Self-monitoring has been studied in various chronic diseases such as cardiovascular disease (CVD), for instance, to help patients to control their blood pressure (BP). The studies show positive¹ and mixed results², suggesting that this technique can be beneficial if combined with co-interventions and/or telemonitoring. The LUMC via the Box is implementing a service that combines self-measuring devices altogether with telemonitoring. This service aims to provide quality care and convenience to the patients that suffered a MI, reducing the number of visits to the hospital while being constantly monitored. Nevertheless, this method can be difficult to adopt for senior citizens and other individuals not used to new technologies. For this reason, the cardiology department of the LUMC is interested in getting to know more about the usability and acceptability of the products of The Box.

Method

Similar studies have been conducted with elderly population in Edmonton, Canada³ showing positive acceptance. However, the products of The Box are used in combination with a smartphone, adding a layer of complexity that will be taken into account.

This study will use a combination of observations, audio recorded semi-structured interviews and questionnaires to evaluate the usability of the products. Five patients will be interviewed following a semi-structured interview format, for which 4 open questions for each product have been prepared (Appendix A). During the interviews the products will be presented in order to point out to specific problems. Finally, the patient will be asked to fill in a short questionnaire (Appendix B) with several questions to evaluate the products with regard to security, reliability and aesthetics.

As 4 to 5 patients are enough to detect 80% of the usability problems including the most severe ones⁴, this number is considered complete and adequate for the proposed study.

Appendix A. Semi-structured interview

Introduction:

Good morning/afternoon. Thank you for participating in this research about the products given in The Box. I would ask you several questions about your experience using the different products. I will record our conversation to ensure that we have an accurate summary of your opinions. All the information we collect will be kept confidential. You may refuse to answer any questions or leave the interview at any time. Do you have any questions before we begin? Please feel free to ask questions at any time during the interview.

About the patient profile	
1	What is your age?
2	What is your profession? (follow up) Do you work after the heart attack? Are there any complications?
3	What is your familiar situation? - Live alone, with family, someone to support (give some options).
4	Are you going to the rehabilitation center at the LUMC? Did you receive feedback from the devices that is not aligned with the plan prescribed there?
About the blood pressure monitor	
1	For how long have you been using the blood pressure monitor? Did you have one before?
2	Was the blood pressure monitor easy to use? - Please, tell me more. Why it was easy to use?
3	Were there any difficulties using the blood pressure monitor? - Please, tell me more. Why it was difficult to use?
4	I would like to walk through how you use the device, the steps you follow. Can you please explain what you did on each step? For that purpose I brought an identical blood pressure monitor. Please feel free to use to better explain yourself.
About the smartwatch	
1	For how long have you been using the smartwatch? Did you have one before?
2	Was the smartwatch easy to use? - Please, tell me more. Why it was easy to use?
3	Were there any difficulties using the smartwatch? - Please, tell me more. Why it was difficult to use?
4	I would like to walk through how you use the device, the steps you follow. Can you please explain what you did on each step? For that purpose I brought an identical smartwatch. Please feel free to use to better explain yourself.
About the scale	
1	For how long have you been using the scale? Did you have one before?
2	Was the scale easy to use? - Please, tell me more. Why it was easy to use?
3	Were there any difficulties using the scale? - Please, tell me more. Why it was difficult to use?

4	I would like to walk through how you use the device, the steps you follow. Can you please explain what you did on each step? For that purpose I brought an identical scale. Please feel free to use to better explain yourself.
About the ECG	
1	For how long have you been using the ECG? Did you have one before?
2	Was the ECG easy to use? - Please, tell me more. Why it was easy to use?
3	Were there any difficulties using the ECG? - Please, tell me more. Why it was difficult to use?
4	I would like to walk through how you use the device, the steps you follow. Can you please explain what you did on each step? For that purpose I brought an identical ECG. Please feel free to use to better explain yourself.
About the System	
1	Tell me about your experience using the applications.
2	Were there any difficulties using the smartphone in combination with the devices? - Please, tell me more. Why it was difficult to use?

Appendix B. Questionnaire

Please fill in the following questionnaire stating if you agree or disagree with the following statements.



	Strongly Disagree	Disagree	Agree	Strongly Agree
It is safe to use				
It is reliable				
It is well designed				
It is attractive				
It is a medical device				

Please fill in the following questionnaire stating if you agree or disagree with the following statements.



	Strongly Disagree	Disagree	Agree	Strongly Agree
It is safe to use				
It is reliable				
It is well designed				
It is attractive				
It is a medical device				

Please fill in the following questionnaire stating if you agree or disagree with the following statements.



	Strongly Disagree	Disagree	Agree	Strongly Agree
It is safe to use				
It is reliable				
It is well designed				
It is attractive				
It is a medical device				

Please fill in the following questionnaire stating if you agree or disagree with the following statements.



	Strongly Disagree	Disagree	Agree	Strongly Agree
It is safe to use				
It is reliable				
It is well designed				
It is attractive				
It is a medical device				

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