HOW TO INCREASE THE ACCEPTANCE OF AN ONLINE TELEMEDICINE SERVICE?

A.J. Beukema, BSc

FACULTY OF BEHAVIOURAL, MANAGEMENT AND SOCIAL SCIENCES

COMMUNICATION SCIENCE
SPECILIZATION: TECHNICAL COMMUNICATION

SUPERVISORS:
Dr. J. Karreman
L. Vermeij, MA

8 JULI 2016

UNIVERSITY OF TWENTE.

I. Abstract

The body of the older adult becomes more vulnerable and needs more care. The increased vulnerability of elderly, called frailty, is a substantial problem in this age group. To prevent and decrease frailty the Roessingh Research and Development is currently working on an European project called "Perssilaa": a telemedicine service is developed for older adult to screen for their health and eventually prevent frailty. By using this system the participants will get a result about their health. Three outcomes are possible: robust (healthy), pre-frail (doubtful), or frail (unhealthy). The system will communicate this information to the participant using a feedback screen.

The aim of this research was to gain insights in how the acceptance of an online service to screen for frailty among older adults between the age of 65 and 75 could be maximized. To research how to increase the acceptance of the telemedicine service two aspects are identified as important factors: the acceptance of the system, and the acceptance of the information.

The acceptance of the system is described as whether the older adults are able to use this system to its full potential and are willing to use it. The acceptance of the system is essential since it will influence the perceived usefulness and the perceived benefit. To maximize the acceptance of the system a usability test is performed to identify usability problems. The results of the usability-test combined with theoretical factors resulted in recommendations. When these recommendations are applied it is expected that the system becomes more usable for the older adults, and thereby the acceptance of the system will been increased.

Next to the acceptance of the system, the acceptance of the information is crucial since when the users do not believe, trust or understand this information, the effect of the system still will be insufficient. Also the compliance will drop. To investigate how to increase the acceptance of the information, different versions of the feedback screen are developed for the three possible outcomes (robust, pre-frail, frail). The influence of empathic statements and tailored elements is tested on the acceptance of the information. This is tested by performing interviews with the target group of the system: older adults. Interviews resulted in guidelines for when which elements are necessary and useful.

- When the outcome is robust (positive), the older adults indicated a preference for a tailored version with personal details and personal feedback, but no significant difference was found.
- When the outcome was pre-frail (doubtful), the users preferred a tailored version, with or without empathic elements.
- When the outcome was frail (negative), the participants preferred a version with tailored elements and empathic statements, too comfort them.

When these guidelines are followed, the acceptance of the information will be increased. The combination of the increase in the acceptance of the system and the increase in acceptance of the information will result in an increased acceptance of the online service. So this study gives insight in the preference of users for certain types of information. It also indicates how to make a system more usable and user-friendly. These aspects are often lacked in current telemedicine applications. With the new information gathered by this research, telemedicine applications can be improved and the acceptance of those systems will increase.

II.   Table of Content

1 Introduction

This study is carried out in cooperation with Roessingh Research and Development (RRD). This center is the largest research institute for rehabilitation technologies in the Netherlands ("About RRD," 2014). Two main areas of their expertise are rehabilitation technology and telemedicine, where this research is carried out in the field of telemedicine.

1.1 Frailty

Humans are getting older and older. It is a common known that the aging population requires more healthcare and the costs will therefore rise. Neuman, Cubanski, Huang, and Damico (2015) noted that the aging population contributed the most to this "excessive spending growth". The body of the older adult becomes more vulnerable and needs more care. The increased vulnerability of elderly, called frailty, is a substantial problem in this age group (van Velsen et al., 2015). Clegg, Young, Iliffe, Rikkert, and Rockwood (2013) even stated that *"frailty is the most problematic expression of population ageing".* Identifying frailty could have positive influence on the high costs of the healthcare system.

Frailty gradually occurs and will get more intense when getting older. This increased vulnerability could be a result of several factors. Gomez, García-Sánchez, Carta, and Antunes (2013) identified the diminishing of the physical and cognitive condition, and malnutrition as a major aspect of frailty.

Due to frailty, a small accident could result in disproportional effects. This vulnerability is shown in *Figure 1*; elderly with frailty (red line) respond much more intense to a minor illness than fit elderly (green line), resulting in dependence of the elderly with frailty.
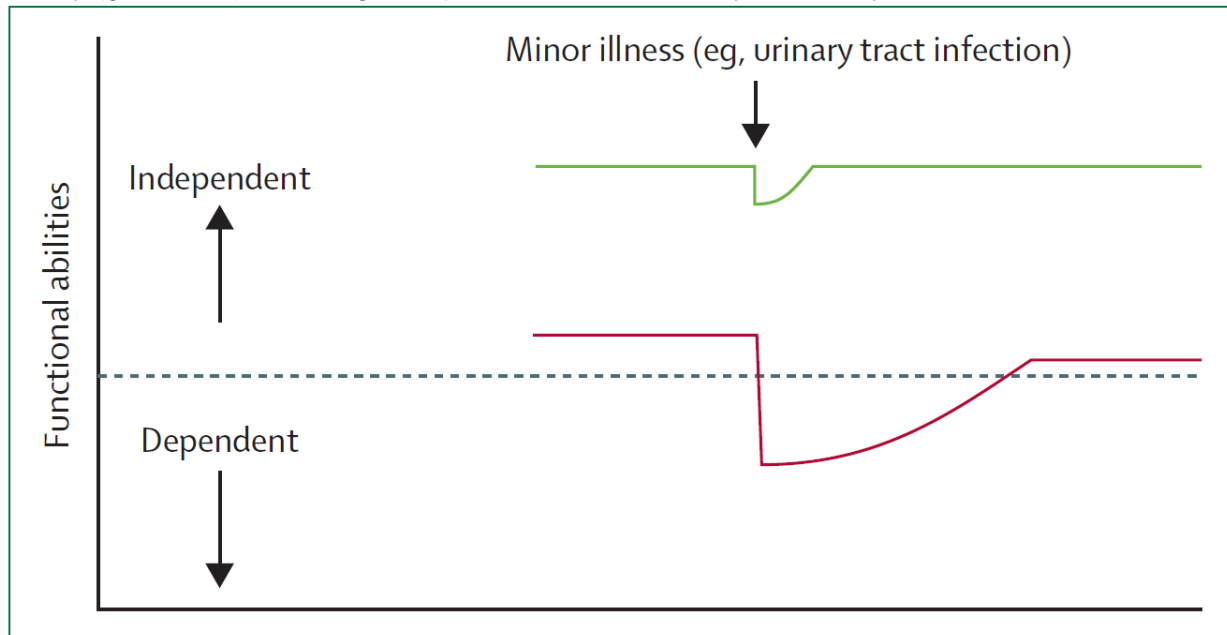

Figure 1. Graphical representation of the effect of a same minor illness on the dependence of elderly, where the green line indicates fit elderly and the red line indicates elderly with frailty. *Figure obtained from Clegg et al. (2013)*

1.2 Perssilaa

Identifying the older adults with frailty is difficult since the frailty is a "hidden" problem; the older adult will only notice the frailty when a minor illness arise and a disproportional effect occurs. One wants to prevent and decrease the frailty so this will not happen. Therefore, the RRD is currently working on an European project called "Perssilaa" (**Per**sonalized ICT **S**upported **S**ervice for **I**ndependent **L**iving and **A**ctive **A**geing), together with eight other institutions in five different countries ("Perssilaa," 2014). This project is focused on developing an ICT system for independently living older adults, in the age group of 65 till 75, to screen for their health and eventually prevent frailty. Perssilaa is designed as an online environment in which the results are automatically produced.

1.2.1 Telemedicine

The Perssilaa system is a telemedicine service. Telemedicine is a developing area in the current medical field. Telemedicine literally means "healing at a distance"(Strehle & Shabde, 2006). This implies that the main concept of telemedicine is the transaction of medical information over a distance (Argy & Caputo, 2001). These new systems are a promising advancement in the development of the online and remote health services (Chun & Patterson, 2012). The World Health Organization underlines that this area of expertise is constantly advancing due to the incorporation of new technologies and improvements (World Health Organization, 2010). This implies that telemedicine is not a fixed expertise and it is constantly developing and growing. Since more and more technology is available, which is the heart of telemedicine according to the World Health Organization, the field and applications of telemedicine will increase and grow.

1.2.2 Phases

Perssilaa consists out of different phases. First the participant will be invited to participate in the project by an invitation letter send by the patient's general practitioner. Then the first phase is a general screening containing a questionnaire that can be filled out by the participants themselves. This can be done using the online tool. When the participants finished the questionnaire, the online tool will give an immediate result to the elderly about their health. Three results are possible: robust, possible pre-frail, or frail:

- The robust participants will be invited to participate again next year.
- The possible pre-frail participants will be invited for a real-life second screening that will be executed by a health provider to test whether the participant is really pre-frail, or robust, or frail. When the participant turns out to be robust or frail, the result is the same action as after the first screening. But when a participant is designated as pre-frail after the second screening, several training services will be offered to prevent this person from becoming frail and therefore stay healthier for a longer time.
- The frail participants will be invited to see their general practitioner for further investigation.

An overview of these phases can been seen in Figure 2.

Invitation

First Screening

Frail   Possibly Pre-Frail   Robust

Second Screening

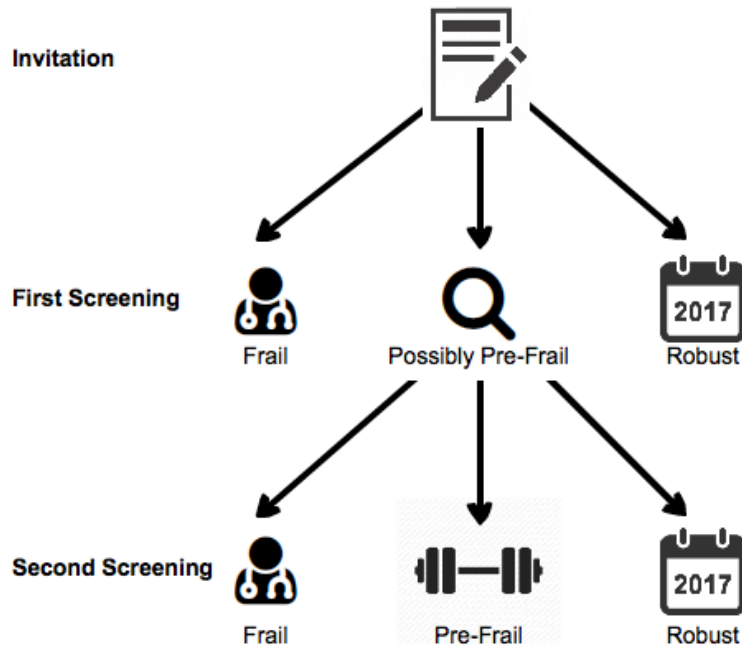Frail   Pre-Frail   Robust

Figure 2. Overview of the phases of Perssilaa. The first screening resulted in frail, possibly pre-frail or robust. The second screening makes clear whether the possibly pre-frails are frail, pre-frail or robust. The pre-frails will gain extra training and exercises to prevent from becoming frail.

1.3 This study

The Perssilaa system automatically generates a result about the health of the participant. When this information is delivered to the participant, it is important that the user will accept the telemedicine service in order to comply to the result. Developers of telemedicine systems often underestimate the importance of acceptance, and therefore a significant amount of new applications failed to get common ground (Buck, 2009). The initial enthusiasm for a new system might be caused by the existence of the new application and could rapidly fade out over time (Buck, 2009). Therefore, it is important to focus on the acceptance of the telemedicine service and not rely on the initial enthusiasm since that would probably fade away fast after the first usage of the system. Acceptance of the application is also important since it is a determinant of the success of the system. So since the success of the Perssilaa project largely depends on the success of the first phase, the focus of this research will lay on this first screening.

If the first screening is not executed in a user-friendly way, the participants will not accept the system and will not be able to use the system to its full potential. Also since the older adults are known for their lack of ICT skills, usability and user-friendliness are very important aspects (Heart & Kalderon, 2013). Next to that, the result is about the health of the participant. Looking at the vast number of theories for communicating medical information, health-related issues could be difficult to communicate, not to mention communicate medical information in an online environment. So the way the result is communicated to the user is crucial.

Based on the above, this research will try to find answers on how to increase the usage of the system and how to best present the health related results in an online environment. The combination of these two aspects must result in an increased acceptance of the system. Therefore, the main research question of this research is:

> "How can the acceptance of an online service to screening for frailty among older adults between the age of 65 and 75 be maximized?"

2 Theoretical Framework

The frailty mentioned in the introduction is a growing problem among the ageing population. To identify the frailty a telemedicine system is developed. In order for this telemedicine system to be successful the system must be accepted by the target audience. Therefore, in this research the acceptance of the telemedicine service will be tested. This acceptance is twofold: the acceptance of the telemedicine system on the one hand, and the acceptance of the health related information provided by the system on the other hand. Both will be discussed and researched. Before treating the two aspects of acceptance, it is important to gain insight in the target group and the way this group uses ICT.

2.1 Older Adults and ICT

Research showed that there is a negative relation between age and the use of ICT (Heart & Kalderon, 2013). But this negative relation is shifting. One of the reasons for this shift is the fact that the usage of ICT by older adults has constantly changed over the past years. The smartphone revolution has made the usage of ICT systems increasingly easy due to the introduction of the touchscreen (Heart & Kalderon, 2013). The systems have become more intuitive and easier to understand so there is a lower learning threshold to start using a device. Another important aspect is the fact that the group of older adults is constantly renewing with adults who already acquired ICT skills in their life. Since this negative relation is shifting, some researchers maintain that the negative relation between age and ICT skill is a temporary phenomenon and will decrease and fade away over time (Heart & Kalderon, 2013). The negative relation might be a contemporary problem, the need to make ICT system accessible for older adults is still vital and required.

Some might state that the lack of ICT skills is the reason why older adults have a lower computer use, but this is too narrow minded since there might be more reasons contributing to the lower use. Wagner, Hassanein, and Head (2010) performed a literature review and combined numerous studies researching computer use by older adults. They identified common uses of the computer by older adults. One of these uses is information seeking about health-related issues (Wagner et al., 2010). Next to these common uses, Wagner et al. (2010) identified barriers to computer use; the lack of use is ascribe to the lack of perceived benefit (Melenhorst, Rogers, & Bouwhuis, 2006). This lack of perceived benefit is twofold: the user's needs are not met by the technology, or the user is not competent of perceiving the benefits of the system. Another barrier to use computers by older adults is the lack of motivation or interest (Morris, Goodman, & Brading, 2007; Wagner et al., 2010). This lack is underlined by Heart and Kalderon (2013), who found that older adults are willing to put effort in acquiring new ICT skills when they perceive the system as useful and fulfill their specific personal needs. This is connected with another important aspect of computer use: the support and training provided (Wagner et al., 2010). Aula (2005) suggested that access to a computer is not satisfactory: older adults needs support and training to motivate them. This training and motivation can generate an increased perceived usefulness which results in the usage of the ICT-system.

The fact that older adults are willing to work with new devices and applications is a promising fact for this research, since this research is focusing on a new application. But one must keep in mind that the older adult will not automatically use the system due to the possible lack of perceived benefit or incompetence to perceive this benefit.

2.2 Acceptance of the System

As mentioned, one aspect which is important for the acceptance of the online service is the acceptance of the system. This is described as whether the older adults are able to use this system to its full potential and are willing to use it. To research how the acceptance of the system can be increase, two aspects are exposed: human factors and usability. Here, the human factors are theoretical aspects and the usability is an observational aspect. It is expected that both the human factors and usability will have positive influence on the acceptance of the system, so both are requirements for an increased acceptance of the system.

2.2.1 Human factors

Human factors are the theoretical basis for assessing the acceptance of the system. Bulik (2008, p. 169) defined the human factors as "the patient and the health-care provider perceptions of telemedicine". These factors have influence on the acceptance of a telemedicine system and are therefore essential (Buck, 2009)**.** Buck (2009) identified nine human factors which she stated, are fundamental for user and health-care provider acceptance of the system. One of these nine factors is the previously mentioned perceived usefulness. When the perceived usefulness is not sufficient, older adults do not want to put effort in getting familiar with the system and the acceptance of the system will be low. Buck (2009) stated that the added value of the system for the user must be evident. The user must instantly grasp the right to exist of the service and the purpose of the system. Next to that the payoff must be clear, so what is in it for them, which Rogers (2003) defines as 'relative advantage'.

Next to the perceived usefulness Buck (2009) identified eight other factors. She stated that these factors will contribute to the appreciation of specific applications. Some factors are only applicable on health care providers, so not all nine are applicable for this research which focuses on the user. The factors are based on literature and discussions with telemedicine implementation staff and are designed for all user groups, so they are also applicable for older adults. The human factors applicable for this research are:

- Condescending must be avoided at all time. The communication between the user and the system must occur normally. So the interaction must be at a correct level.
- The user must be able to control the system. When the application takes away the authority of the user, the user will feel unsafe and the acceptance will decrease.
- The emotional status of the patient must be taken in to account. Buck (2009) stated that the patient will act else ways based on their emotional status and receive information differently than in an ordinary situation.
- The traceability of information must be taken into account. The information provided by the user is input in the system. It is not desirable that patients must justify their input.

2.2.2 Usability

The human factors identified by Buck (2009) can be used when assessing the online system based on theoretical knowledge. Next to these factors the usability is also a suitable aspect that can be used for assessing the system by observation. The ISO 9241-11 definition of usability is: "The extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use." (ISO, 1998). In this research the usability is the ease of use of the system by older adults. When the usability of the system is low this means the user cannot fully use the system to its potentials. In other words, when the usability is low the user will not perceive its full usefulness

and the acceptance will decrease. Based on that, the usability is a requirement for perceived usefulness and therefore is an important aspect of the acceptance of the system.

As stated earlier, the combination of older adults and ICT is usually not a convenient and fruitful one. Older people do have less experience with ICT and therefore feel less comfortable using the technology (Fredrickson et al., 2010). Other research suggested that the age in itself is not a barrier to use the computer, but the age related deterioration such as changes in vision and hearing are the cause (The National Institute on Aging & The National Library of Medicine, 2009). The ability of older adults to process information is also decreasing and could negatively influence the usage (Salthouse, 1985). This makes it difficult for those people to directly understand new information. But even when an older person can read the display, this does not mean that the person is able to use the device due to the fact that the display might be too difficult to interpret and understand (Akatsu & Miki, 2004). So especially with older adults it is important to focus on the usability of the system.

Nielsen (1993) identified several attributes of usability that are important for interactive devices: learnability, efficiency, low error rates, and user satisfaction. When assessing usability these aspects must be taken into account. Nielsen (1993) stated that learnability is the most fundamental component, and implies that the difficulty for novice users must be low. It also involves the productivity of the system, so when the users learned the system, they can correctly use it. Efficiency covers the number of error rates, which are incorrect actions of the users and are unwanted. These error rates must be as low as possible. The last attribute, user satisfaction, deals with how pleasing the system is for the user (Nielsen, 1993).

Based on these attributes Nielsen (1993) stated that one can assess a device since these four components can be measured. Nielsen underlined the measurability of usability for all users but in this research we are dealing with older adults. For those users, Nahm, Preece, Resnick, and Mills (2004) stated that measuring usability in the way Nielsen described is not possible for older adults due to the lack of research done in this age group. This is because it is not sure if the measurements of Nielsen are also applicable for the older adults. Therefore, we have to focus on the implication of age on the usability tests.

2.2.3   Usability and older adults

Several usability studies have been carried out regarding older adults. Some examples are usability testing with older adults on a health communication program (Lin, Neafsey, & Strickler, 2009), on a website with tailored medical advice (Nyman & Yardley, 2009), on a computerized cognitive screening test (Fredrickson et al., 2010) and on older adults seeking online health information (Becker, 2004). This type of research resulted in a considerable amount of design implications for interfaces designed for older adults. Next to these studies, guidelines are created for designers of websites, such as the guidelines created by The National Institute on Aging and The National Library of Medicine (2009) (the NIA&NLM).

These guidelines are needed since the motor skills of older adults are deteriorating, the cognitive abilities change and so is their sensitivity to colors and contrasts (Lin et al., 2009; T.A. Salthouse, 1996; The National Institute on Aging & The National Library of Medicine, 2009). This implies that adapting the website and tailoring the interface is needed to keep the device accessible to the older users. Adaptations on the font size, font type, resolution, color-coding, contrast and mouse clicks can be used for this tailoring (Lin et al., 2009).

Strickler and Neafsey (2002) provided very practical design implications, such as the use of bold sans-serif Arial font with a size of 18-24 points and navigation buttons with a size of at least three centimeters. This is underlined by the guidelines provided by the NIA&NLM. The

difference is that the NIA&NLM suggests using a 12- or 14- point font size, together with the addition to adapt the font size by using buttons on the page. Due to the decreased motor skills, the clickable objects must contain space around them, so it is easy to click on the right item. Below are some other design guidelines displayed which are retrieved from the NIA&NLM:

- Usage of buttons: to make the navigation more accessible, buttons must be placed on the website providing actions such as "next page" and "previous page".
- Proper usage of links: to make the links more understandable, words must be included that describe the links, not just "click here".
- Clickable links: it must be obvious that the links are clickable, by using colors and underlining.
- Usage of single clicks: only use this type of clicks since the motor skills are deteriorating of older adults.
- Minimize vertical scrolling
- Speech function: not every individual wants information in the same way. Therefore it is important to provide another type of media than written text. A speech function that read text aloud is an option. A button on the webpage must activate this function.
- Use left justification, so each line start at the same place on the left side.

These guidelines must result in a senior-friendly website, although this is not always the result (Hart, Chaparro, & Halcomb, 2008). In the research of Hart et al. (2008) the websites that complied the most to the NIA&NLM guidelines yielded better result on the task success, but not significantly on the efficiency, satisfaction and preference. As a result, Hart et al. (2008) suggests to evaluate a website based on guidelines, but also perform a usability test as an addition to the guidelines, since guidelines are often to general and lack detail.

2.2.4 Usability-tests and older adults

Usability-tests are important to improve the usability as mentioned. Another reason why testing with real users is crucial, is to gain insight in the users in more detail. The awareness of the capabilities and capacities of older adults is not fully understood until researchers encounter the user group (Newell, Arnott, Carmichael, & Morgan, 2007).

Performing tests with older adults must be taken seriously, partly because older adults are mostly more vulnerable than younger adults and due to the deterioration mentioned earlier. This must be taken into account when doing research with older adults, and especially when performing usability-tests for an online system. Nahm et al. (2004) stated that the currently used usability-testing methods should be modified to the need of the older adults. van der Geest (2006) even takes the older user group together with users with disabilities when making recommendations and adaptations for usability tests.

Suggested adaptations such as not delaying questions about the behavior of the participants and give more time to older adults who are not familiar with the technology are proposed (Nahm et al., 2004). These suggestions are practical and useful to take into account when designing the research. Other suggestions are adapting the difficulty of a think-aloud method and a more extensive and carefully preparation of the participant on the testing. The suggestions entail the difficulty of performing usability-tests with older adults. Newell et al. (2007) underlines this difficulty and carefulness of usability testing with older adults.

2.3 Acceptance of the Information

When the acceptance of the system is adequate, it is expected the users are able to work with the system. Therefore they will work with the system resulting in acceptance of the system. But when the result of the test is displayed to the user, and the user does not believe, trust or understand this information, the effect of the system still will be insufficient; the acceptance of the information is inadequate. Therefore it is important to gain insight in the information needs of the older adults. Thus how the information must be provided to increase this acceptance of the information, so they will believe, trust and understand the result.

2.3.1 Communication of medical information

When designing the feedback screen, the information must be clear and no questions must arise. Next to that it is important to know what kind of information and to which amount patients want to receive information about their condition. A study more than 20 years ago stated that the vast majority of cancer patients want to know all the possible positive and negative information about their status (Tattersall, Butow, Griffin, & Dunn, 1994). This statement is underlined by more research (Barclay, Blackhall, & Tulsky, 2007; Hagerty et al., 2004; Thorne, Hislop, Kuo, & Armstrong, 2006)
The patients' wish is to receive realistic information in a positive way. Although most patients wish full disclosure, there are still some patients who do not want full disclosure about their health status; there is a wide variety in the desire for disclosure (Barclay et al., 2007).
Delivering news, especially bad news, is an important theme in the medical literature. Several methods exist in how to deliver this type of information. These bad news conversations are chosen as a starting point for this analysis due to their severity and impact on the patient. The theory used for the most severe communication (bad news) could also be applicable on less severe communication (positive news), although less important.
Several definitions of bad news circulate in research. Some define bad news as "any information likely to alter drastically a patient's view of his or her future" (Buckman, 1985, p. 1597). Ptacek and Eberhardt (1996) use a slightly different and more detailed definition where bad news is "news that results in a cognitive, behavioral, or emotional deficit in the person receiving the news that persists for some time after the news is received". According to these definitions various receivers interpret bad news in a different way based on his or her expectations of the future. This implies that bad news can trigger diverse reactions, and the delivery must be adapted to those reactions; there is no golden rule how to deliver bad news.
The bad news in Perssilaa is not as drastic and severe as the bad news described above, where the researches referred to presenting bad news about cancer diagnoses. The news presented in Perssilaa is an indication or notice and more like a warning that there is a possibility of bad news in the future.
According to the definitions of bad news one could argue to be not in favor of delivering bad news via an online medium since there is often no interference of a human in an online environment. This interference is necessary to adapt the delivery to the reactions of the patient. The absence of human interference is a core concept of the telemedicine to keep the cost low and efficiency high. So this is a non-disputable aspect that we cannot change. The challenge is to make this online delivery of bad news in such a way that it is acceptable without the human interference. Although, at the Perssilaa system the real bad news will not be told by the system, but by the general practitioner.

2.3.2 Bad news conversations in clinical settings

Good communication between the patient and the clinician is important and indispensable and will lead to greater satisfaction and improved understanding (Barclay et al., 2007; Shaw, Zaia, Pransky, Winters, & Patterson, 2005). So good communication is extremely important especially when delivering bad news. Since this is a challenge for most of the health providers, several protocols and guidelines are developed for delivering bad news.

Girgis and Sanson-Fisher (1998) defined 19 general principles for delivering bad news. Below are some important principles presented that are applicable for this study. The guidelines and principles presented are focused on real conversations between a clinician and patient. The news presented in the Perssilaa system is not a conversation but a one-way communication that can be seen as an announcement. Although this is a different approach, the guidelines and principles can help to present the right information in a proper way.

1. *Information giving should be a staged process that occurs over several consultations. An initial desire about the amount of information wanted may change and patients may feel abler to cope with more information over time, so ask on more than one occasion how much-or what else-the patient wants to know.*
   This principle suggests that information giving is a staged process. The moment when the user fills in the survey and gets a result could be the start of a medical process. This moment can be seen as the first stage of information providence from the clinician to the patient. The patient must be prepared for this moment so the user expects this kind of information. Also the amount of information must be taken into account since it is the first contact.
2. *The person who brings the news should ideally be the primary care physician or senior consultant who has had ongoing contact with the patient and will continue to be involved in the patient's care, such as planning the treatment. The task of delivering bad news should not be given to junior medical staff by default.*
   This principle suggests that the primary physician must present the information. In the case of Perssilaa that is the General Practitioner. This must be shown in some way in the results.
3. *Give accurate and reliable information so that the patient understands any implications. Ensure that the patient understands treatment options and the reasons for any future investigations.*
   This principle underlines the importance of presenting the treatment options in a clear and right way. This is especially important since in this stage the patient must be told what he or she is expected to do after receiving this information. Also the motive for this treatment options must be unambiguous.

Next to these principles, Baile et al. (2000) created a six-step strategy called SPIKES. This strategy is developed for health practitioners who want to deliver bad news to their patients in a face-to-face conversation. This strategy is more practical than the principles and can be applied directly into the communication-strategy of the health provider:

1. **S**etting up. This is the preparing of the conversation and includes aspects such as arrange privacy and involve significant others.
2. **P**erception. Get information about how the patient perceives the medical situation.
3. **I**nvitation. This step is to get insight in the amount of knowledge the patient wants to know: some want to know every detail while some do not.

4. **K**nowledge. Give the information to the patient. Tips are included here such as use the vocabulary of the patient, do not use technical words, avoid excessive bluntness and give information in small chunks. So the information in the Perssilaa system must be presented without too much technical and medical terms; there is no human interference so every aspect and concept must be clear for every reader. This is also underlined by the third principle discussed before.
5. **E**motions. When the bad news is delivered the patient will have emotional reactions, such as shock or grief. The physician can use empathic responses to offer support and solidarity.
6. **S**trategy and Summary. At the last part, the treatment plan can be discussed and a summary must be given to check for misunderstandings. This covers the same aspect as the third principle discussed before.

The general implication presented by the guidelines and principles is the need of real human contact. Via the online system this is not possible, since the response will be automatically generated based on the information provided by the user. The consequence of the lack of human interaction is that the message cannot contain too much detailed information, especially not negative information. The information must be as clear as possible and must not provoke any questions: these questions cannot be asked and answered immediately. Possible gaps of information must be identified in the message.

2.3.3 Challenges for an online system

The implications for the online system are clear and useful. But maybe more important than the implications are the challenges posed by the guidelines and principles. The guidelines and principles show the downside of presenting health related news without the interference of a human via an online medium. Especially the "Perception", "Invitation" and "Emotions" parts of the SPIKES principle are very difficult to achieve in an online environment, if not impossible. Fulfilling "perception" and "invitation" is virtually impossible because there is a need of interaction. These aspects are needed in real-life communication but might not be needed for the online medium. Since as stated earlier, the moment the information is presented can be seen as the first stage; as a warning and introduction to the topic. The next step might be contact with the physician or another type of caretaker. At that moment, the aspects perception and invitation that are lacked in the online communication must be taken care of.
Whereas perception and invitation are not possible in the online tool, "emotions" is difficult but not impossible: the information can be presented in such a way that the emotions of the patients are taken into account and the message will be empathic.
The lack of real human contact result in less personal communication. This can be solved by adding more personal elements to the online communication by using tailored messages. These two aspects, empathic statements and tailored messages, could have positive influence on the acceptance of the information.

2.3.3.1 *Empathic statements*

Despite the difficulty of adding emotions to the online tool, it is an important aspect which can lead to increased acceptance of the information. Several researchers have studied the effect of empathy on the communication between healthcare providers and patients (Coulehan et al., 2001; Derksen, Bensing, & Lagro-Janssen, 2013; Hojat et al., 2011; Kim, Kaplowitz, & Johnston, 2004). The results of these studies all show the importance of using empathy in the communication when delivering news. For example, Coulehan et al. (2001) underlines the effect of empathy on the diagnostic accuracy, therapeutic adherence, and patient satisfaction. Kreps

and Neuhauser (2013) stressed the importance of empathy in online health communication, since empathy will result in increased immediacy.

The use of empathy by the healthcare provider could lead to better understanding and bigger trust in the healthcare provider, and in patient disclosure. Patients will give a more complete clinical history because they are more at ease (Halpern, 2003). This results in a more precise diagnosis and greater patient compliance (Hojat et al., 2011). Improved compliance is also underlined by Derksen et al. (2013), but also emphasized there is a relationship between empathy and patients' anxiety and distress. In turn, the diminution of anxiety could also lead to better clinical outcomes (Halpern, 2003).

Although most of the researches mentioned are carried out with real life communication between patients and doctors, they all demonstrates the effects of empathy. Thereby, when face-to-face conversations and telemedicine consultations are compared on the amount of empathic statements, the telemedicine applications fall behind and lack empathy (Liu et al., 2007). Also, the amount of empathy is declining in new telemedicine systems (Terry & Cain, 2016), while as showed empathy is an important aspect with multiple positive effects. Terry and Cain (2016) stated that empathy will become a critical issue in the telemedicine applications when one wants to provide excellent care.

So based on that, empathy could be an aspect that can be used to increase the acceptance of the information in an online tool, which is currently lacking in the telemedicine applications. It is expected that the more severe the message is, the more empathy is needed and wanted, since emotions become important when the message contains more bad news.

2.3.3.2 Tailored messages

Using empathic elements in the online health communication could be an effective way to increase the acceptance of the information. Another way to increase this acceptance could be achieved by tailoring specific parts of the communication (Nyman & Yardley, 2009). When tailoring information the message will be more relevant for the user by matching the message with the personal needs and preferences (Kreuter, Farrell, Olevitch, & Brennan, 2013); the information in the message is adapted by the information given by the user in the survey. Ryan and Lauver (2002) performed a literature study evaluating studies researching the effect of tailored information. The findings of their study show that in 50% of the studies tailored information has a significantly better effect than non-tailored information. In those cases the studies showed that tailored information is read, remembered, discussed, liked and understood more often than non-tailored information (Ryan & Lauver, 2002). Nyman and Yardley (2009) identified another effect of tailored information: increased persuasiveness. They used the elaboration likelihood model by Petty and Cacioppo (1981) to explain this statement. They stated that more personal relevant information makes the message more personal (Nyman & Yardley, 2009), and thus more persuasive.

The other half of the studies analyzed by Ryan and Lauver (2002) did not show a significant effect of tailored information, but showed an equivalent effect between tailored and non-tailored information. Concluding from the review of Ryan and Lauver (2002) the usage of tailoring information is encouraged since it performs the same or better than non-tailored information. This conclusion is underlined by Neuhauser and Kreps (2010) who stated that for effective online health communication the message must be more "personalized" and "contextual", so tailoring is the advice.

Based on the above, tailoring could influence the acceptance of the information in an online tool in a positive way. It is expected that users prefer tailored communication over non-tailored communication, regardless the severity of the result.

2.4 Research question

In the theoretical framework several aspects arose on how to increase the acceptance. Based on that, the main research question of this research is:

"How can the acceptance of an online service to screen for frailty among older adults between the age of 65 and 75 be maximized?"

To get answers to this main question two sub questions must be answer:

1. How could the acceptance of the system be maximized?
    o Can the human factors be used to increase the acceptance of the system?
    o Is the usability of the system adequate?
2. How could the acceptance of the information be maximized?
    o What is the influence of empathy on the acceptance of the information?
    o What is the influence of tailoring on the acceptance of the information?

The two sub questions posed will both answered in a separated part; this research consists out of two studies. Therefore two methods were developed and they will be presented separately.

3 First Study

3.1 Research Design

For the first study the first sub question is the main topic for research, so it will focus on how the acceptance of the system could be maximized. In the theoretical framework two subjects are identified to influence the acceptance of the system: human factors and usability. The human factors can be used to increase the acceptance of the online tool based on the theory, where usability must be observed and thus tested with the older adults. Therefore, this first study started with a usability study. The results of this test are used together with the human factors and design implications based on guidelines. This combination resulted in recommendations on how to increase the usability which will lead to increased perceived usefullness, and therefore the acceptance of the system.

Next to the main topic (the acceptance of the service) this first study also investigated the current acceptance of the information, specifically the result. Therefore, the participants are interviewed after the usability test to get insight in the ideas and conceptions about the current information. These results will be used as input for the second study.

3.1.1 Design

The first study consisted out of two parts, a usability test with subsequently an interview. The usability test with a think-aloud protocol has been conducted to get answers to the main topic of this part. Based on the theoretical framework the following aspects were taken into account when performing the usability test:

- Not delaying questions about the behaviour to the end.
- Giving more time to the participants if they are not familiar with the technology.
- Preparing the participant in a more extensive and careful way than used to.

3.1.2 Procedure

During this usability test the participants were asked to use the website of "langgezond". This website is part of the Perssilaa project. Therefore, the users had to log-in, or first register themselves, depending on whether they used the system before or not. After logging-in they needed to fill in the questionnaire. When they were finished filling in the questionnaire the result of the user was displayed on the screen and the usability test was finished.

After the usability test, the interview follows. First part of the interview is to gain insight in the opinion of the user regarding their own result and the presentation of this information. Questions are asked about the way the information of the result was presented to the user, the wording, and ambiguities, such as "What do you think of this outcome?", "Are things unclear about the result?", "How is the wording of the text?".

Next part of the interview was discussing the other possible results of the test (robust, pre-frail, or frail). This is done to gain insight in the opinion of the user for all the three outcomes. The same type of questions are asked as in the first part of the interview.

The protocol for the usability test and interview can be found at Appendix A - Usability protocol.

3.1.3 Materials

We divided the website used for this study (langgezond.nl) into three parts. Each part has its own function resulting in different ways the information must be communicated, and different information needs. These three parts are: the home screen, the survey, and the feedback screen.

3.1.3.1 Home screen

This is the first screen the user will be seen when visiting the website. At the home screen the users can login with their personal username and password. There is also a possibility to register, retrieve the credentials when forgotten, or go to a page with frequently asked questions. Next to these options there is a short explanation about the project, what to do, and contact information. The used home screen is displayed in Figure 3.
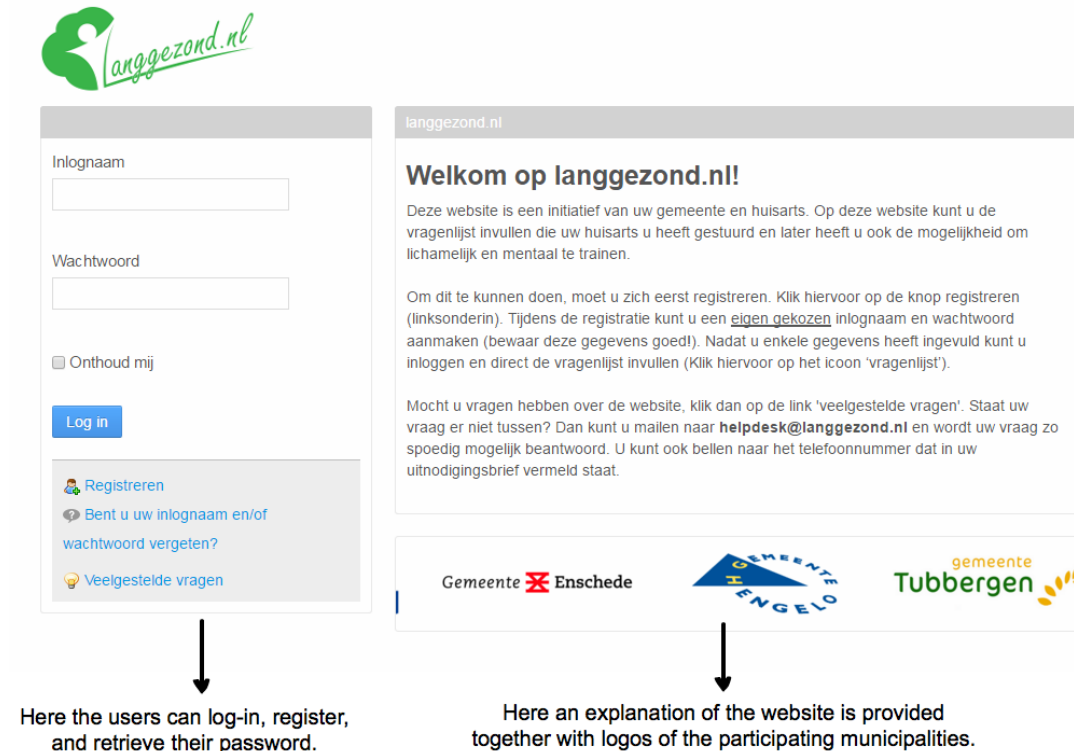
Figure 3. The current version of the home screen of the Perssilaa system langgezond.nl.

3.1.3.2 Survey

The survey used in the system is developed by the RRD in collaboration with other parties, such as the University of Twente, University of Lisboa, and the University College Cork. The survey is divided in four main parts:

- General health
  This part assessed the general health and frailty of the participant. The questions are based on the "Groningen Frailty Indicator" and on the "Intermed Elderly Self-Assessment".
- Cognition
  This part assessed the cognitive health of the participant. The questions are based on the "GFI Question 10" and on other scales.
- Nutrition
  This part assessed the nutrition of the participant. The questions are based on the "Mini Nutritional Assessment"

- Physical
  This parts assessed the physical condition of the participant. The questions are based on the "Katz Index of Independence of Daily Living" and on the "Physical functioning subscale of the SF-36-item Health Survey"

More information and details about the used questionnaires for the four parts can be found at O'Caoimh et al. (2014). All questions are closed end questions, with the exception of one question. The whole survey (paper version) can be seen at *V.II Appendix B - Survey*.

3.1.3.3 Feedback screen
When the participant finished the survey, the result will be immediately displayed on the screen. The three possible results are: robust, pre-frail, or frail. For each of this outcome, a different feedback screen will be displayed. On this screen the four categories are displayed. Depending on the result, these categories are followed by a checkmark, question mark, or marked with a general practitioner. After this categories, a short explanation about the result is given with information about the follow-up. An example of a frail feedback screen is displayed at Figure 4.
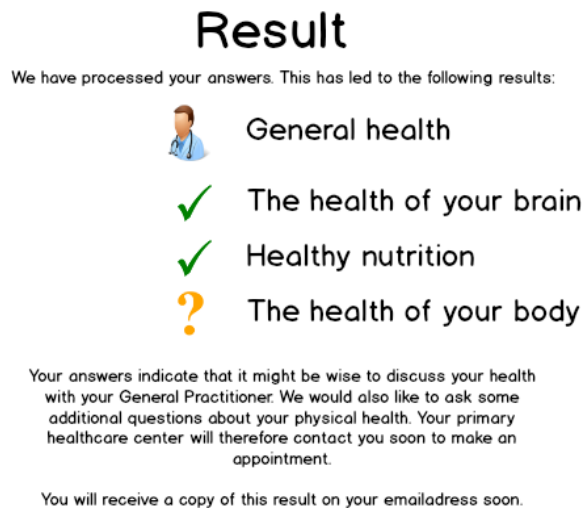
Figure 4. The feedback screen provided at the end of the survey when the results are displayed for a frail user. The health of the body is questionable and the general health must be assessed by the general practitioner.

3.1.4 Participants
A total of nine people, six females and three males, participated in the first study. All participants are in the age between 65 and 75 years and live in Twente. Five participants are novice users and never used this system before, where four participants used the system before. Out of the nine people, five assessed the online tool using the computer, three used an iPad to fill out the survey and one participant used a printed version.

3.2 Results

The usability tests and interviews are analysed and several problems occurred. The problems are categorised by the three parts defined at the material section.

3.2.1 Home screen

The home screen is the first screen the users are confronted with when visiting the website. Therefore, based on the human factors defined in the theoretical framework the perceived benefit must be clear right away. When there is a lack of perceived benefit the potential users will not take part. Also the trustworthiness must be taken into account since health related issues are confident. Even as the usefulness of the system must be clear, so what do the participants gain from it when using the system. There is a lack of these items on the current home screen.

Next to the evaluation based on the human factors, the usability test showed other difficulties on the home screen, such as the login procedure and the registration. The novice users must register themselves. Out of the five novice users one achieved to complete the registration and logged-in without any problems (20%). Three novice users were not familiar with the principle of creating a personal username and password (60%). One person of the novice users received an error when saving her personal record, since the e-mail address was not written in the correct format (20%), and could not solve this problem on her own. These four participants were not able to log-in by themselves, and therefore were not able to gain access to the system and therefore not able to use the system (80%).

The experienced users were already registered and could log-in using their own selected username and password. Two out of four participants were able to login without any problems (50%). The other two forgot their credentials and needed to retrieve their password, although they were not familiar with the system of retrieving a password and therefore did not know what to do (50%). So these two participants were not able to use the system.

These results are displayed in Table 1.

Table 1
Number and types of log-in problems based on the usability-test.

	Users		
	Novice (n=5)	Experienced (n=4)	Total (n=9)
Log-in without problems	20%	50%	33%
Not familiar with procedure	60%	50%	55%
Not able to log-in	80%	50%	66%

3.2.2 Survey

The users filled in the survey of "langgezond" and mentioned problems with filling in the survey during the usability test. For the analysis four types of problems, called categories, are identified:

- Category 1: Difficulty understanding the question.
  This is the case when the user does not immediately understand the question. This could be caused by difficult words or ambiguous syntaxes. This is noticed when users for example repeatedly reread the sentence or the question was misinterpreted. An example of this category is the following quote from the usability test where the user read "You have less restrictions than you wanted." instead of "You have accomplished less."

- Category 2: Missing answer.
  The user wants to select an answer but the proper answer is not displayed. Therefore, the users must choose an answer that does not reflect the user's behavior. An example of this category is this quote from the usability test: "Accomplished less? … You want to do a lot but you cannot finish it all, but that is due to the age. So I would say no, but it could also be sometimes. But that is not an answer option."
- Category 3: Wrong or misplaced examples.
  When examples are given the combination is conflicting and incompatible for the user. For example, users must answer if they are able to run, lift heavy objects, and do strenuous sports. Some might state they are not able to run but are able to lift heavy objects, so they do not know which answer to select.
- Category 4: Difficulty answering the question.
  When the difference between for example "yes" and "no" is not clear, the user does not know what to choose. Also when it is not clear what normal behavior is, or if it is age-related degradation. An example of this category is taken from the usability test: "Complains about your memory? Sometimes. But actually no. I think this is normal, due to the age. Everybody suffers from it."

In the tables below the results are presented. In Table 2 the prevalence of the problems per category is displayed. Also is displayed at how many questions the problem occurs. The questionnaire consisted out of 45 question and some questions consisted out of multiple components where a total of 22 questions are identified as problematic.

Table 2

Prevalence of the problems per categories in total and at how many questions this problem occurs.

Type of problem	Prevalence	#of questions
Category 1: Difficulty understanding the question	13	7
Category 2: Missing answer	7	6
Category 3: Wrong or misplaced examples	8	7
Category 4: Difficulty answering the question	4	2
Total	32	22

3.2.3 Feedback screen

The feedback screen is the final screen the users see when they have filled in the survey. For the user it must be clear why their answers lead to this result. Also the next steps must be clear for the user, so go to the doctor or go to the second screening. Even as what to do in case questions arise.

The feedback screen is analyses based on the comments given during the interview. Several categories are identified to classify the problems encountered in the interview and are displayed below. The prevalence of the problems are displayed in Table 3.

- Misunderstanding of signs.
  The signs used at the feedback screen (the sings of the general practitioner, checkmark, and question mark) are misunderstood or misinterpret.
- Insufficient explanation.
  In this case the user complained about the lack of information. This lack of information could be about the next step so the participant does not know what to expect or what will happen

now. It could also be about the reason this particular result is shown, so why for example the user scores insufficient on "mental health".

- Contact.
  Some result stated that the user will be contacted by his or her general practitioner or by someone else. But in this case the users stated that the they will contact their general practitioner in advance.
- Not participating in tests.
  The user stated that he or she will not participate in further tests.
- Distressed.
  Some results evoked distress by the participant. For example, some participants stated that they would be distressed and will worry when the health of their brains is doubtful.
- Not trusting the outcome.
  In this case the users stated that they do not trust the outcome since it does not correspond with their status.

Table 3
Prevalence of the problems occurred when facing the feedback screen.

Problem	#persons	#
Misunderstanding of signs	3	4
Insufficient explanation	4	6
Creating contact ahead	6	6
Not participating in tests	1	1
Distressed	3	4
Not trusting the outcome	5	6

3.3 Recommendations

The results are combined with the human factors (see *2.2.1*) to make recommendations on how to increase the acceptance of the system by improving the three different regions.

3.3.1 Home screen

The home screen must be improved so the users can log-in, since with the current design only 33% of the users are able to log-in. The current design is more useful for experienced than for novice users, but still lacks sufficiency. Next to that, there is no difference for novice users visiting the website for the first time and experienced users visiting the website for a second time or more. The intention of the Perssilaa is to distribute the survey once a year. So one could say that the users will never become experienced users. However, participants can also use the platform for home-exercises and workouts. Therefore participants will use the system more than once a year and will become an experienced user.

To overcome the lack of difference between experienced and novice users a welcome page can be added. Here users can select if they visited the website before can solve this problem, see Figure 5. When users select their experience level, they will be guided to the page with the right and useful information. In this way each novice and experienced user obtains specific information need (novice users need registration instructions and experienced users need log-in and credential retrieval instructions).

Welkom op langgezond.nl!

Deze website is een initiatief van uw gemeente en huisarts. Op deze website kunt u de vragenlijst invullen die uw huisarts u heeft gestuurd en later heeft u ook de mogelijkheid om lichamelijk en mentaal te trainen.

Geeft hieronder aan of u eerder van deze website gebruik heeft gemaakt door erop te klikken.

Ik heb **eerder** gebruik gemaakt van langgezond.nl

Ik heb nog **geen** gebruik gemaakt van langgezond.nl

Figure 5. Possible home screen where users can select if they used the website before or not. Based on their selections the user will be guided to the right page with the needed information and instructions.

Additional explanation about the project must be provided on the homepage, to clarify the importance of participating, the impact for the user, and what to expect. When this is done properly the perceived benefit will increase which is essential for the acceptance of the system. Also the perceived usefulness will increase.

The explanation about how to use the website must be provided on the home screen together with login and register instructions. Currently there is also a lack of guidance through the registration. Adding this guidance could increase the success of logins for novice users. For the experienced users the procedure of login in and retraining their credentials must be guided and explained in more detail.

Based on the design implications discussed in *2.2.3 Usability and older adults* the home screen can be further improved. The font is a sans serif type but the size is not adaptable. The used buttons are too small and the corresponding text at the links are not always clear.

When these recommendations are implemented it is expected that the home screen is more user friendly and users will be able to successfully use the system.

3.3.2 Survey
When looking at the results the participants encountered a total of 32 problems when filling in the survey and 22 questions are identified as problematic. Those questions must be analyzed and then adapted. The total number of problems must be taken into account when performing this analysis, even as the validity of the survey when adapting questions. Most of the problems can be solved by

- Adding an answer option, such as add "sometimes".
- Adapting the definitions used in the question, such as change "energetic" into an easier to understand concept.
- Change the examples used in the question.

- Add explanation about what is "normal" for the user group. For example a question about memory-problems: for the participants it was not clear if forgetting a grocery is normal behavior or age-related degradation.

Next to the problems with the question, the design can be improved to increase the acceptance of the system. For example, the buttons for answering questions are too small for the users which resulted in incorrect clicks.

3.3.3 Feedback screen
The problems presented in Table 3 suggest the feedback screen can be improved. This will be used as input for the second studies and discussed in that section.

4   Second study

4.1 Research Design

The second study focused on the second sub question, so how the acceptance of the information could be maximized. The output of the first study combined with the theoretical framework is used as input for this study.

4.1.1   Design

To gain answer to the second sub question a qualitative research has been performed. It is an interview-based research to gain insights in the preference of the users and the reasons of this preference. During the interview users will compare different versions with each other.

4.1.2   Procedure

For the interview, participants were assigned to one of the three outcome categories: robust, pre-frail, or frail. During the interview the different versions were presented and discussed for one of these outcomes.

At the start of the interview the participants gained explanation about the research. Since the results are not applicable on the participants but are fictive, a scenario was introduced. This scenario covered background information of the user called "Ans Jansen", who already used the system. She filled out the questionnaire and received the result. This result is presented to the participants during the interview in different forms. These different forms are presented one-by-one in a randomized order. The participants gave answer to different type of questions covering their opinion, their preference and points to improve.

The scenarios can be viewed at Appendix C - Scenario's and the interview protocol can be viewed at Appendix D - Interview protocol second study.

4.1.3   Material

To test the acceptance of the information the feedback screen was used and adapted. Several versions of the feedback screen were created based on the previous results and the literature. To test the preference of the target group an interview protocol was created.

Based on the theoretical framework two elements are identified which could increase the acceptance of the information: empathic statements and tailored elements. To test the influence of these two components four versions of the feedback screen were developed: an original version, an empathic version, a tailored version, and a combined empathic and tailored version. As stated earlier, three outcomes are possible: robust, pre-frail, and frail. For each outcome, these four different feedback screens were developed. So a total of twelve feedback screens were developed for this study.

To guarantee the internal validity of this study, the different versions are discussed with a text-expert. The different versions were analysed by the expert on comprehensibility, clearness, empathy and on personalisation (tailored). Based on the feedback from the expert, some minor adaptations were made.

4.1.3.1 Original feedback screen

The original version will be used as a baseline. This version does not contain any empathic or tailored elements. It is based on the version used in the first study (see *Figure 6A.*) but is enhanced based on the feedback provided during the interviews from the first study:

- Users wanted more explanation, so this is added. This is also used to explain the signs which were sometimes misinterpreted.
- For each result-category (general health, health of the brains, nutrition, health of the body) the result is displayed, instead of one whole block of text.

Based on the design implications and guidelines described in the theoretical framework, some design adaptations are made:

- The font type is changed to Arial.
- The font size is increased to a minimum of 14.
- Vertical scrolling is minimized by increasing the results-window, so the text can be displayed on a wider screen.
- Left justification is applied.

The adapted version for frail-users can be seen at *Figure 6B.*

Figure 6. **A.** The original version of the feedback screen for frail-users used in the first study. **B.** The enhanced version of feedback screen for frail-users based on the feedback provided during the interviews in the first study and the design implications from the theoretical framework. More information is provided, the signs are updated, and the appearance is changed.

4.1.3.2 Empathic feedback screen

This empathic version is based on the literature about the bad news conversations and the importance of empathy in the message (see *2.3.3.1 Empathic statements*) and contains empathic elements.
To apply and add empathic elements the literature is used. Baile et al. (2000) used the SPIKES method for an effective communication between patient and healthcare provider and used empathic statements and validating responses. An empathic statement reflects the feeling of the patient so he knows he is understood (e.g. "I can see how upsetting this is to you."), while a validating response underlines the legitimacy of the feelings of the patient (e.g. "You were perfectly correct to think that way."). These two types are underlined by Hospice Friendly Hospitals . They underline the importance of identify the emotion by sentences such as "I can see this is very distressing" and validate the patient's feeling by sentences such as "I wish the

news were better". These two type of sentences (reflecting response and validating response) are used for the implementation of empathic elements. The sequence used in the empathic responses is:

- Reflect the feeling
- Validate the feeling
- Explain why this feeling is validated

For the three possible outcomes, different types of empathy are necessary. For the frail version the empathic element looks like:

> "Maybe this results comes as a surprise for you and u did not expected this. This reaction is understandable, but there is no reason to worry about. This test give an impression about your health and the general practitioner will examine the results more extensively to judge your health. The general practitioner knows you and will be able to judge your health in a better way."

Here the first sentence is the reflection of the feeling, the second sentence is the validation of the feeling, and the third and fourth sentence is the explanation why this feeling is validated.

4.1.3.3   Tailored feedback screen

This version contains tailored elements. As suggested in the theoretical framework, specific parts of the communication are tailored to the user. Kreps and Neuhauser (2013) suggest to use the patient's name or nickname in the online health communication. Also the usage of collective terms ("we" and "us") will lead to better communication and engagement. So this is applied for the creation of the tailored version. Next to that, the answers of the participant to certain question are displayed in the results.

The tailored elements which are added are: the name, the age, the name of the general practitioner, and the participant's e-mail address. Also answers to certain questions given during the survey are incorporated in the result. If the result is positive one positive answer is taken from the survey, but if the result is questionable or negative one positive and one negative answer is taken from the survey.

So if the mental health is positive, one answer is taken from the survey to show why this point is positive. For example: "You stated that, among other things, you have no difficulties remembering appointments. You have also answered other questions positive and therefore we conclude that the health of your brains is good."

4.1.3.4   Empathic and tailored feedback screen

The fourth version is a combination of the empathic and the tailored version. The combined version is displayed at Figure 7. For an overview of all twelve versions, see Appendix E - Overview of the feedback screens.

Uitslag

Beste mevrouw Jansen,
Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Gezien uw leeftijd van 69 jaar leidt dit tot de volgende uitslag.

👤 Algemene gezondheid

U geeft aan geen dagelijkse problemen te ondervinden doordat u slecht hoort, maar minder bereikt dan u zou willen. Hierdoor kunnen wij niet met zekerheid vaststellen hoe goed uw algemene gezondheid is.

✔️ Gezondheid van uw hersenen

U geeft onder andere aan geen moeite te hebben met het herinneren van afspraken. Ook heeft u andere vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

✔️ Gezonde voeding

U geeft onder andere aan dat u de afgelopen 6 maanden niet bent afgevallen zonder dat u dat wilde. Ook heeft u andere vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

❓ Gezondheid van uw lichaam

U geeft aan geen beperking te hebben bij het knielen en buigen maar niet zelfstandig boodschappen te kunnen doen. Hierdoor kunnen wij niet met zekerheid vaststellen hoe goed de gezondheid van uw lichaam is.

Uw antwoorden geven aan dat het verstandig is om uw gezondheid met uw huisarts Frederiksen te bespreken. Hiervoor zal uw huisartsenpraktijk binnen 5 werkdagen contact met u opnemen om met u een afspraak te maken. U ontvangt binnenkort een kopie van deze uitslag op uw e-mailadres.(ans.jansen@gmail.com).

Misschien komt deze uitslag als een verrassing voor u en had u dit niet vewacht. Deze reactie is begrijpelijk, maar er is nog geen reden om u zorgen te maken. Deze test geeft een indruk van uw gezondheid en de huisarts zal uitgebreider naar de resultaten kijken om uw gezondheid te kunnen beoordelen. De huisarts kent u en zal uw gezondheid dus beter kunnen beoordelen.

Figure 7. The combined empathic and tailored version of the feedback screen for frail-users. The red parts are empathic elements, where the blue parts are tailored elements. For the empathic version only the red parts are added, and for the tailored version only the blue parts are added to the original version.

4.1.4 Participants

A total of 30 people participated in the second study. All participants are in the age between 65 and 75 years and live in different parts of the Netherlands. The 30 participants are equally and randomly distributed among the three test groups: robust, pre-frail, and frail. The average age and distribution of males and females is shown in Table 4.

Table 4.
The distribution of the participants among the three test groups.

	Robust (n=10)	Pre-Frail (n=10)	Frail (n=10)
Average age	69.5	71	69.9
Number of female	8	7	7
Number of male	2	3	3

4.2 Results

The interviews are analysed and the preferences of the participants are identified. The participants ranked the four different versions from most favourable to least. For the analysis this ranking is transformed in points:

- The first choice gets 4 points.
- The second choice gets 3 points.
- The third choice gets 2 points.
- The fourth choice gets 1 point.

So one participant is worth a total of 10 points. When the participant placed two versions on the same rank, it is made sure that the total points of that participant is still 10. For every version in each category the total number of points is displayed in Table 5. The maximum score a version could score per category is 40 points (10 participants give 4 points), the minimum is 10 points (10 participants give 1 point).

Table 5.
Overview of the points awarded to the four versions for the three different outcomes.

Version	Robust (n=10)	Pre-Frail (n=10)	Frail (n=10)
Original	20	19	14
Empathy	21.5	18.5	22.5
Tailored	31	33.5	30.5
Empathy and Tailored	27.5	29	33

4.2.1 Statistical Analysis

To test for significant difference in the preference of the user for a certain version, a Friedman test has been conducted for all three outcomes.

For the robust outcome, there was no statistically significant difference in the preference for a certain version, $x^2 = 5,24$, $p = 0.12$. For the pre-frail outcome, there was a statistically significant difference in the preference for a certain version, $x^2 = 10,51$, $p = 0.02$. For the frail outcome, there was a statistically significant difference in the preference for a certain version, $x^2 = 13,56$, $p < 0.01$.

To test which versions are preferred over one another, a post hoc analysis was performed for the pre-frail and frail outcomes. The Wilcoxon signed-rank test was conducted. The p-values gathered by the post hoc test are displayed in Table 6.

Table 6
P-values for the comparison of the different versions gained from the Wilcoxon signed-rank post hoc analysis for the pre-frail and frail outcomes.

	Original		
Outcome	Empathy	Tailored	Empathy and Tailored
Pre-Frail	0.917	0.004	0.080
Frail	0.039	0.042	0.014

	Empathy	Empathy and Tailored	
Outcome	Tailored	Empathy	Tailored
Pre-Frail	0.027	0.045	0.351
Frail	0.112	0.028	0.668

Since multiple comparisons are made, a correction must be done in order to prevent a multiple comparisons problem. This correction is done by using the Benjamini-Hochberg procedure. Therefore, the p-values are ranked from the lowest to the highest. Then the Benjamini-Hochberg critical value (CV) is computed:

$$CV = \frac{i}{m}Q$$

Where i = the rank, m = the total number of comparisons, and Q = the chosen significance. Since the population is relatively small per category (n=10), and the number of comparison is relatively high (6 comparisons), the chosen significance is set at 10% instead of the regular 5%. The ranked p-values and their corresponding critical value is displayed in Table 7.

Table 7
The ranked p-values for the pre-frail and frail conditions, with their corresponding critical value (CV) with a chosen significance of 10%.

	1	2	3	4	5	6
			Pre-Frail			
P-value	0.004	0.027	0.045	0.080	0.351	0.917
CV	0.017	0.033	0.050	0.067	0.083	0.100
			Frail			
P-value	0.014	0.028	0.039	0.042	0.112	0.668
CV	0.017	0.033	0.050	0.067	0.083	0.100

As long as the p-value is lower than the CV (P-value < CV), that p-value is significant. Based on the Benjamini-Hochberg procedure the first three p-values for the pre-frail condition are significant, and the first four p-values for the frail condition are significant.
For the pre-frail version the following significant differences were found:

- Tailored > Original: The tailored version scored significantly higher than the original version (p<0.01).
- Tailored > Empathic: The tailored version scored significantly higher than the empathic version (p=0.03).
- Empathic and Tailored > Empathic: The combined empathic and tailored version scored significant higher than the empathic version (p=0.05).

For the frail version the following significant differences were found:

- Empathic and Tailored > Empathic: The combined empathic and tailored version scored significant higher than the empathic version (p=0.03).
- Empathic, Tailored, Empathic and Tailored > Original: The empathic version, the tailored version, and the combined empathic and tailored version scored all three significant higher than the original version for the frail outcome. (respectively p=0.04; p<0.01; p=0.01)

4.2.2 Reasons for the preference
The aim of the interviews was to get an overview of the preference of the participants for a particular version, which is analysed in the previous section. But it is also important to know why the participants preferred a specific version over another since this will increase the usefulness

of the results. Therefore, the interviews are analysed and common reasons are identified. A bottom-up method, also called inductive method has been used for creating a coding scheme, so the analysis is data-driven (Braun & Clarke, 2006). The following codes are used:

- **Less Standard**   Used when participant stated that the text is perceived less standard:
  "At this, you don't feel like a number."

- **More Comforting**   Used when participants stated that they felled comforting or eased by the text:
  "At this way, you ease someone."

- **More Details**   Used when participants stated the the text contained more details:
  "This is more extensive."

- **More Friendly**   Used when participants stated that they perceived the text friendlier, or more empathic:
  "It is expressed friendlier."

- **More Personal**   Used when participants stated that the text contained more personal elements, or when it was perceived as more personal.
  "At this version, it is really about her and they talk to her."

- **No Added Value**   Used when participants stated that the element did not add any to the message of the result:
  "It's nice to have the sentence, but when it is left away you won't miss it."

- **Not Comforting**   Used when participants stated that the sentence or element did not comfort them:
  "In this way you will become shivery, since you must worry."

- **Too general**   Used when participants stated that the result is too general, or there is a lack of detail:
  "In general it feels too black and white."

- **Too long**   Used when participants stated that the result is too long, or contained too much information:
  "The extra explanation is not necessary. If it is good, its good …. It is to detailed."
  "It's not necessary, since the shorter, the better."

- **Too short**   Used when participants stated that the message was too short or contained too less information:
  "I require some extra information, more words."

- **Unnecessary**   Used when participants stated that it was not necessary to add the element:
  "This is not necessary for me. It's fine, … but for me it is not needed."

- **Vague**   Used when participants stated that the message was vague or unclear what is meant:
  "I don't get this …. Has she followed a diet? It is not totally clear to me."

To test the inter- and intraobserver agreement the Cohen's Kappa is calculated. A second encoder coded 62 items out of the 168 items which were coded by the first encoder. The Cohen's Kappa is 0.698, which can be classified as substantial (Stemler, 2001). The SPSS-

output can be viewed at Appendix F - SPSS-output**.** The results of the scoring based on the codes are displayed in Table 8. Although there was not found a significant difference between the scores of the robust outcomes, we will also include the robust outcomes in our analysis to gain insight in the reasons of the participants. When the scores are analysed combined with the statistical results, some things are noticeable:

- For the robust outcome there was no significant different found. Although, the original version is marked as too short 4 times, where the other versions were not. That could have caused the low score of the original version (20 points) for the robust outcome. The empathic version also scored 4 points on both "unnecessary" and "no added value", which could have caused the low score of empathy (21.5 points) on the robust outcome. The tailored version was 5 times perceived with "more details". Thereby, 7 times it has been noticed as "more personal", but 3 times it was noticed as unnecessary. The high number on "more personal" could have caused the high score of the tailored version (31 points).
  The combined empathic and tailored version was 4 times seen as "unnecessary" and 3 times as "too long", which was the result of the empathic elements, which users already identified as "unnecessary". This could have caused the lower score for the combined version (27.5 points) than for the tailored version.

- For the pre-frail outcome, the statistical analysis showed a significant difference between the empathic version and both the tailored and the combined empathic and tailored version. So the adding of the tailored element is preferred than no tailored element for the pre-frail outcome. The interview showed that the tailored element was perceived as more personal (4 times) and the user saw more details (7 times), causing the high score for the tailored version (33.5 points) than the empathic version (18.5 points). But the combined empathic and tailored version was 4 times perceived as "unnecessary" (the same as the empathic version), where the tailored version was just 1 time perceived as "unnecessary". So the adding of the empathic element was less in favour, which caused the lower score of the combined empathic and tailored version (29 points) than the tailored version (33.5 points), although no significant difference was found between these two versions.
  The original version (19 points) received almost the same score as the empathic version (18.5 points). The original version was 4 times perceived as "too short", where the empathic version was 4 times seen as "unnecessary". Thereby, the original version was 2 times seen as "not comforting" and the empathic version 3 times. This could have caused the low score for both these versions.

- For the frail outcome, the empathic, tailored, and combined empathic and tailored version are all three significant higher than the original version. This could be caused since the original version was 2 times perceived as "too general" even as "vague", and 3 times perceived as "not comforting".
  Although the combined empathic and tailored version was perceived 1 time more "unnecessary" than the empathic version, the combined version scored (33 points) significant higher than the empathic version (22.5 points). Based on the scores this could not be explained.
  There was no significant difference found between the tailored and the combined empathic and tailored version. Although, the score for "more details" and "more personal" are notably higher for the tailored version than for the combined version.

Table 8
An overview of the scores for the four different versions per outcome category.

Robust (n=10)				
Code	O	E	T	E&T
Less Standard	-	-	2	-
More Comforting	-	1	-	-
More Details	-	-	5	-
More Friendly	-	2	-	1
More Personal	-	2	7	1
No Added Value	-	4	-	-
Not Comforting	1	-	-	-
Too general	1	1	-	-
Too long	-	2	2	3
Too short	4	-	-	-
Unnecessary	-	4	3	4
Vague	1	-	-	-

Pre-Frail (n=10)				
Code	O	E	T	E&T
Less Standard	-	-	1	-
More Comforting	-	3	-	2
More Details	-	1	7	-
More Friendly	-	3	2	1
More Personal	-	-	4	1
No Added Value	-	-	-	-
Not Comforting	2	3	-	3
Too general	1	1	-	-
Too long	-	2	1	1
Too short	4	-	-	-
Unnecessary	-	4	1	4
Vague	-	1	3	1

Frail (n=10)				
Code	O	E	T	E&T
Less Standard	-	-	-	-
More Comforting	-	8	1	2
More Details	-	3	7	2
More Friendly	-	1	2	1
More Personal	-	-	7	2
No Added Value	-	-	-	-
Not Comforting	3	1	-	-
Too general	2	-	1	-
Too long	-	-	-	-
Too short	1	-	-	-
Unnecessary	-	3	2	4
Vague	2	-	5	-

Next to these scores, there are other points that requires attention when analyzing the interviews. Some participants stated that the results were vague. This was caused by multiple factors:

- In the feedback, it was stated that a copy of the result will be send to the participant's e-mail address. For some it was not clear that the result they were facing would be send to them; they thought they would receive more explanation on their e-mail address.
- Also the tailored version sometimes caused some confusion, since for the questionable result one positive and one negative answer was taken from the survey. The sentence that was formulated raised questions since the participants thought the positive and the negative answers were correlated with each other.

Also the terminology was sometimes perceived as a burden. Several participants were not pleased with the following wordings:

- "Health of your brains/body". These terms were identified as too general and too broad. The health of the brain says nothing about the possibility for a potential brain trauma, such a a Cerebro Vasculair Accident as pointed out by one participant:
  "Health of your brains is about remembering appointments, but that is not important for a Cerebro Vasculair Accident. So this is not really about the health of the brains."
  The same is true for the health of the body, since participants noted that this is only about the physical condition.
- "…help you get a healthier body". The term "healthier body" was perceived as patronizing. Thereby, older adults often have some physical problem, such as arthrosis, and therefore it is not possible to make the body healthier, maybe only somewhat more flexible or more fit.
- "… and therefore we conclude that…". This term "conclude" was perceived as too straightforward and too strict. Participants complained that a conclusion stated like that is not desirable when filling in an online survey, since the results must be checked by a health provider; the results are a indication and this must be mentioned in the result. Also some participants recommended more restraints for the robust version; the result is not an assurance for a healthy life for the next year.

Thereby, it was noted that frequently the statements were misread by the users, especially the tailored version. The difference between *"een"* en *"geen"* (one and non) was often not seen. So users read: "you have one limitation regarding kneeling and bowing." instead of "you have non limitation regarding kneeling and bowing."
Also, the users asked what the difference was between the categories (general health, health of the body, health of the brain, healthy food), since this was not clear. They did not understand the difference between "general health" and "health of the body".

4.3 Recommendation

The three different versions have been tested on preferences with the older adults. Based on the results recommendations can be made for the different outcomes. Also some recommendations can be made which are applicable for all the different versions.

4.3.1 General

The terms used in the feedback must be adapted, especially the terms described in the previous section which are identified as unpleasing. But the difficulty of the wordings must be taken into account, since the result must be comprehensible for all participants.

The tailored version sometimes caused vagueness since the chosen examples did not complement with each other. Some participants suggested to only show the negative point when the result is negative or questionable, while others did not agree with that since the positive points are also very important.

Thereby, the users frequently misread statements such as "one" and "no". To solve this, these statements could, for example be highlighted to force the user to focus on that word. When this is not done and the users continue to misread the statements, the message which must be communicated will be changed and the value of the message will be lost.

To solve the fact that the categories were not clear, some participant argued to include more positive and negative points to show the diversity of the category. This will result in a longer feedback which is not desirable, since some versions were already marked as too long. Therefore, explanation could be added about the difference between the categories, before treating the results.

4.3.2 Robust

For the robust version no significance was found between the different version. Although, based on the interviews one can conclude that the user preferred the tailored version when the outcome was robust. Mainly because the original version was perceived as too short, the empathic version as unnecessary, and the combined empathic and tailored version as too long and unnecessary. Adding a restraint will complement the result by assuring people this result is only an indication for their health; in one year the health of a person can drastically change.

4.3.3 Pre-Frail

Based on the statistical results one can conclude that the original and empathic versions scored the lowest, and the tailored and the combined empathic and tailored versions scored the highest. Based on the interview this is because the tailored version was perceived as more personal since the version was more detailed. Thereby the original version was perceived as too short and the empathic version as unnecessary. The tailored version scored somewhat higher than the combined version although not significant, and this is not seen in the scores from the interview.

4.3.4 Frail

Based on the statistical results the original version scored the lowest; all other versions are preferred over the original version. The interviews showed that the original version was too general, too vague, and not comforting. Thereby, the combined version scored significant higher than the empathic version. Based on the we can conclude that the tailored and the combined empathic and tailored version was preferred by the users for the frail outcome.

5 Discussion

The main goal of this research was to study how the acceptance of an online tool could be maximized. Two aspects are taken into account which both could have influence on the acceptance. What is shown is a way to make an online tool more user-friendly and usable (increase the acceptance of a telemedicine application), and how to communicate medical results by using an online tool (increase the acceptance of the information). These two aspects are further discussed.

5.1 Increase the acceptance of a telemedicine application

The first study of this research has focused on how to increase the acceptance of the system. The idea is that the usability and the perceived usefulness for the user must be high in order to accept the system. When the usability is high this means that the older adults are able to fully use the system to its potentials. In order to increase the usability, a usability test has been conducted with the older adults, which results are used to improve the usability of the system. This observations are combined with the theoretical human factors of Buck (2009). These factors are suitable for assessing a telemedicine application and appeared to be useful in combination with guidelines such as the one designed by the The National Institute on Aging and The National Library of Medicine (2009). The usage of the usability-observations in combination with the theoretical factors and guidelines resulted in a complete assessment of the usability of the system. When this is done properly the usability will increase and thus users are able to use the system. In the theoretical framework the difficulty to perform this type of test with older adults is discussed. Some suggestions made by Nahm et al. (2004) and others are implemented in the design of the usability-tests. With this implementation no difficulties arose during these tests. Therefore, performing usability-tests with older adults does not have to be troublesome; with the right precautions these tests can be executed without any problems. The fact that van der Geest (2006) took the older adults and users with disabilities as one group is thus not praised by this research; the older adult must be seen as a specific target group with their own specific needs.

Expected is that when the usability will increase the perceived usability will also increase, since when older adults start using the system they are able to use the system to its full potential and perceive this potential. Although, that increase is likely to be insufficient for all participants and additional effort must be made to let the older adults perceive the usability of the system. The users must be promoted to use the system and perceive that usability of the system, otherwise not all the older adult will start using the system.

Next to the perceived usability is the perceived usefulness. When the perceived usefulness is high this means that the older adults are able to grasp the right of existence and therefore recognize the legitimacy of the system; it must be clear for the user why the system is useful for them and not for the institution who created it. As mentioned, the perceived usefulness is also a prerequisite to increase the acceptance of the system. When the recommendations about the home screen are executed in a right manner, the perceived usefulness can be increased by adding additional explanation about the advantage of using the system, the impact for the user, and what to expect when participating. Next to the improvements for the home screen, the first contact with the participant can be improved; the home screen is not the first moment the users get in touch with the project. The invitation letter received at home is the first moment of contact. This invitation must be designed so that the users immediately perceive the usefulness of using the system. When this is implemented for the invitation letter and the home screen, the perceived usefulness is expected to be increased.

The increasing of the perceived usability and the perceived usefulness will be important for most of the developed telemedicine applications. As stated in the introduction, the initial enthusiasm for a new system might be caused by the existence of the new application and could rapidly fade out over time (Buck, 2009). Therefore it is important to focus on the acceptance of the application. In the way described above the initial enthusiasm can be retained and will probably not fade away, since the users are promoted and able to use the system.

5.2 Increase the acceptance of the information

To investigate how to increase the acceptance of the information, different versions of the feedback screen are developed for the three possible outcomes. With possible additions, the empathic and tailored elements, the results can be communicated in a way the older adult wishes to receive medical results via the internet. When the outcome is robust (positive), there is no clear preference in which version the users wanted; the outcome was positive so it did not matter which outcome was presented to the participants. When a choice must be made, the older adults preferred a tailored version with personal details and personal feedback, but no significant difference was found. When the outcome was frail (negative), the participants preferred a version with tailored elements and empathic statements, too comfort them. When the outcome was pre-frail (doubtful), the users preferred a tailored version, with or without empathic elements. Expected is that when the feedback screen is improved and the implications mentioned above are incorporated, the problems identified with the feedback during the first study will be solved. In this way the acceptance of the information will be increased and the user will continue using the system and the appreciation of the system will increase.

In the theoretical framework several effects of empathy were identified. Kreps and Neuhauser (2013) stated that online empathy would lead to increased immediacy. Based on this research, the increased immediacy is not always the case, since empathy is not always perceived as useful. When the result is not that bad, empathy is not needed and will not have the intended effect, sometimes even the opposite effect. But it will have effect when the result is worse; then the effect of empathy will exist. Empathy is therefore not a panacea which can be used at all times.

On the other hand, the tailored elements yielded the expected results. Ryan and Lauver (2002) stated that tailored information is liked and understood more often than non-tailored information. The tailored versions are indeed liked more often than the non-tailored and the more details made the tailored versions more comprehensible.

The guidelines from Girgis and Sanson-Fisher (1998) and the principles from Baile et al. (2000) are used as a basis to improve online communication for telemedicine service. Although these guidelines and principles are applicable for real-life patient-doctor communication, some aspects are useful for online communication. When analyse these propositions some facets can be picked out and applied to improve the telemedicine communication.

The preference of the older adults for a certain version is applicable for other telemedicine applications too. The preference changed as the message of the result changed. The amount of empathy became more important when the message became more severe. This was expected based on the theoretical framework, but it is the first time this correlation is found in the literature about eHealth and telemedicine applications. Also the importance of the tailored elements is underlined; the tailored elements are crucial and necessary for every result. This combination is a good starting point for future development of this type of applications to increase the acceptance of the information.

5.3 Practical Implications

The findings of this study could be used by developers and designers of online tools for medical purpose, such as telemedicine and eHealth applications. The method used to increase the acceptance of the system gives insights in the actual usage and design problems when the test-group is using the system. These failures will only come to light when performing such a test. The recommendations made to increase the acceptance of the information could be implemented in a system that conveys medical results to the user without interference of a human. The implications for the empathic and tailored elements, and when to use which, must be taken into account when developing such feedback mechanisms. Only when both aspects are included in the designing of the systems, the acceptation will increase and so users will continue using the system.

5.4 Limitations

Although the positive results of this study and theoretical and practical implications, some limitations are identified. As mentioned, the usability test was performed to increase the usability of the system. But this test was performed with novice and experienced users. The experienced participants already used the system and they required less information about the purpose of the system, since they already knew the existence and purpose. Thereby, the novice users did not receive the invitation letter users normally receive when invited to participate with the system. In this letter extra information is provided about the system and some guidance is provided. The lack of this information for the novice users could have resulted in a bias. This could have cause the lower scores for the novice users for logging-in than for the experienced users, which could have influence on the result. Although, the amount of problems that arose with the experienced users were still too high and therefore the suggested improvements are still necessary.

The tailored version contained two aspects of tailoring information which are measured as one: the personal information (name, age, name of general practitioner, and e-mail address) and the extended explanation based on personal answers. The fact that these two aspects are taken as one could be problematic: some participants noted that the personal addressing was preferred, but the extended explanation was unnecessary. This could have influenced the result since participants choose the tailored version for the personal addressing and took the extended explanation for granted.

The interview is used to gain insights in the preferences of the participants for a certain version and the reasons of the preference. When looking at the results of the scoring compared to the significant differences there are some differences which could not be explained using the scorings from the interview. This could be caused by the fact that participants randomly viewed the different versions. The comments given for the tailored or empathic version, could also be applicable for the combined version, but were not explicitly repeated when viewing the combined version, and thus are not noted for the combined version. Therefore, the combined empathic and tailored version scored on multiple point lower than the basic tailored or empathic version, while those elements remained the same. Thus, when looking at the scores of the combined version the scores of the basic tailored and empathic version must be taken in to account. This could be the reason why the score for "more details" and "more personal" were notably higher for the tailored frail version than for the combined frail version.

5.5 Further research

This research focused on how to maximize the acceptance of an online telemedicine service. Recommendations are made and guidelines are designed. It is the first time the influence of different text-elements on the acceptance of the telemedicine system has been tested. The four versions used in the second study are designed for this specific system, but the results can be used for further research. The empathic and tailored versions are based on the literature, and therefore the combined version too. The application of the empathy in the empathic versions follows a principle made for doctors on how to implement empathy in a doctor-patient conversation. This principle is designed for individual usage and requires listening to the patient. The empathic statements are therefore generalized so it applies to every user. This is not a desirable procedure. Further research must be done to gain insight in how to apply empathy in texts and in online telemedicine services. This is interesting for many developers of telemedicine applications, since a lot of those systems are also used as a way to communicate health related results to patients.

The other element influencing the acceptance of the information were the tailored elements. These consisted out of two aspects: the personal addressing and the extended explanation based on personal answers. Further research must focus on the difference between these two aspects on the influence of the acceptation. Then one can conclude what parts of the tailoring are interesting and necessary for communication health related results to patients, and improve and personalize the telemedicine services even further.

To generalize the results of this study further research could focus on measuring the effect of the recommendations and implications on the acceptance. This will give more insights in the effect on the acceptance and increase the validity of this research. Also when this study is performed with other age-groups, the results can be more generalized. In this research only older adults are tested on their preference, but when other age-groups are included, differences in preference might come to light. This can be useful for the development of all types of telemedicine applications since those systems are not only designed for older adults, but for all age-groups.

When focussing more on this specific research, the results, recommendations, and conclusion are based on qualitative research gathered by interviews and literature. The research group is relatively small and additional research must be done to increase this group and make the results more reliable and more generalizable. The preferred feedback versions gathered in this research must be tested with the target audience. This could be done as in the first study, by letting people using the system and fill in the questionnaire. Afterwards the reactions can be gathered which can be analysed. These responses can be compared with the responses gather in the first study of this research. The expectation is that the prevalence of the problems of the improved version would be significant lower than of the original version.

6 Conclusion

The aim of this research was to gain insight in how to maximize the acceptance of an online service to screen for frailty among older adults between the age of 65 and 75. To do so, two aspects are important: increase the acceptance of the system, and increase the acceptance of the information.

A usability test is an efficient way to identify usability problems. The problems combined with theory (human factors) resulted in an improved version of the system which is more usable for the older adults, and thereby the acceptance of the system has been increased. To increase the acceptance of the information, one must take a closer look to the actual information which is communicated to the user. In this study the information was a feedback screen, where different feedbacks were possible: positive feedback, doubtful feedback, and negative feedback. Interviews resulted in guidelines on when which elements are necessary. When these guidelines are followed, the acceptance of the information will be increased:

- When one wants to communicate positive feedback to the user, empathic and tailored elements are not required, but tailored elements improve the acceptance of the information. The tailored elements made the feedback more personal which was perceived as an improvement.
- When the feedback is doubtful, tailored elements are necessary to guarantee the acceptance, although the additive of empathic statements is not crucial since it is sometimes perceived as unnecessary.
- When the feedback is negative, tailored elements combined with empathic statements are mandatory too comfort and ease the patient.

When the acceptance of the system and the acceptance of the information are both optimized, the acceptance of the online service will be maximized. In that way the users are able to use the system the system to its fully potential, and are willing to continue their usage.

III.   Acknowledgments

Although completing a master thesis is the student's job, this could not have been done without the help of dedicated supervisors. Therefore I would like to thank my thesis supervisor Dr. J. Karreman from the University of Twente. The meetings we had were highly valuable and useful. From the beginning she supported me to look further and get the most out of this research. I would also like to thanks my supervisors from the Roessingh Research and Development Lex van Velsen and Stephanie Kosterink for their support and trust in me. They were confident I would be able to tackle the problem of the acceptance of their system. Thanks to them I was able to get access to all the required resources and data needed to complete this research with success. I would also like to thank Nicole Loorbach as a consulted expert and her vision on my research. As the second reader of my thesis I would also like to acknowledge Lotte Vermeij of the University of Twente. I am thankful for her comments and feedback on this thesis.

At last, I want to give thanks to my partner and parents for supporting and helping me from the beginning till the very end of this project. Although some setbacks their believed in me and encouraged me to continue the research and improve even further. This achievement would not have been possible without them. Thank you.

IV.   References

About RRD. (2014).   Retrieved from http://rrd.nl/about_rrd

Akatsu, H., & Miki, H. (2004). Usability Research for the Elderly People. *Oki Technical Review, 71*(199), 54-57.

Argy, O., & Caputo, M. (2001). Introduction to Telemedicine *Information Technology for the Practicing Physician* (pp. 227-233). New York: Springer.

Aula, A. (2005). User study on older adults' use of the Web and search engines. *Universal Access in the Information Society, 4*(1), 67-81. doi:10.1007/s10209-004-0097-7

Baile, F. W., Buckman, R., Lenzi, R., Glober, G., Beale, E. A., & Kudelka, A. P. (2000). SPIKES-A six-step protocol for delivering bad news: application to the patient with cancer. *Oncologist, 5*(4), 302-311.

Barclay, J. S., Blackhall, L. J., & Tulsky, J. A. (2007). Communication strategies and cultural issues in the delivery of bad news. *Journal of Palliative Medicine, 10*(4), 958-977. doi:10.1089/jpm.2007.9929

Becker, S. A. (2004). A Study of Web Usability for Older Adults Seeking Online Health Resources. *ACM Transactions on Computer-Human Interaction, 11*, 387-406.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. doi:10.1191/1478088706qp063oa

Buck, S. (2009). Nine human factors contributing to the user acceptance of telemedicine applications: a cognitive-emotional approach. *Journal of Telemedicine and Telecare, 15*(2), 55-58. doi:10.1258/jtt.2008.008007

Buckman, R. (1985). Breaking bad news: why is it so difficult? *British Medical Journal, 288*(6439), 1597-1599.

Bulik, R. J. (2008). Human factors in primary care telemedicine encounters. *Journal of Telemedicine and Telecare, 14*(4), 169-172. doi:10.1258/jtt.2007.007041

Chun, Y. J., & Patterson, P. E. (2012). A usability gap between older adults and younger adults on interface design of an Internet-based telemedicine system. *Work, 41*(1), 349-352. doi:10.3233/WOR-2012-0180-349

Clegg, A., Young, J., Iliffe, S., Rikkert, M. O., & Rockwood, K. (2013). Frailty in elderly people. *The Lancet, 381*(9868), 752-762. doi:10.1016/s0140-6736(12)62167-9

Coulehan, J. L., Platt, F. W., Egener, B., Frankel, R., Lin, C. T., Lown, B., & Salazar, W. H. (2001). "Let me see if I have this right…": words that help build empathy. *Annals of Internal Medicine, 135*(3), 221-227.

Derksen, F., Bensing, J., & Lagro-Janssen, A. (2013). Effectiveness of empathy in general practice: a systematic review. *British Journal of General Practice, 63*(606), e76-84. doi:10.3399/bjgp13X660814

Fredrickson, J., Maruff, P., Woodward, M., Moore, L., Fredrickson, A., Sach, J., & Darby, D. (2010). Evaluation of the usability of a brief computerized cognitive screening test in older people for epidemiological studies. *Neuroepidemiology, 34*(2), 65-75. doi:10.1159/000264823

Girgis, A., & Sanson-Fisher, R. W. (1998). Breaking bad news. 1: Current best advice for clinicians. *Behavioral Medicine, 24*(2), 53-59. doi:10.1080/08964289809596381

Gomez, M. I., García-Sánchez, I., Carta, A., & Antunes, J. P. (2013). A Collection of Good Practices That Support the Prevention and Early Diagnosis of Frailty and Functional Decline, Both Physically and Cognitive, in Older People. *European Commission, Brussels, Belgium*.

Hagerty, R. G., Butow, P. N., Ellis, P. A., Lobb, E. A., Pendlebury, S., Leighl, N., . . . Tattersall, M. H. N. (2004). Cancer patient preferences for communication of prognosis in the metastatic setting. *Journal of Clinical Oncology, 22*(9), 1721-1730. doi:10.1200/JCO.2004.04.095

Halpern, J. (2003). What is clinical empathy? *Journal of General Internal Medicine, 18*, 670-674.

Hart, T. A., Chaparro, B. S., & Halcomb, C. G. (2008). Evaluating websites for older adults: adherence to 'senior-friendly' guidelines and end-user performance. *Behaviour & Information Technology, 27*(3), 191-199. doi:10.1080/01449290600802031

Heart, T., & Kalderon, E. (2013). Older adults: are they ready to adopt health-related ICT? *International Journal of Medical Informatics, 82*(11), e209-231. doi:10.1016/j.ijmedinf.2011.03.002

Hojat, M., Louis, D. Z., Markham, F. W., Wender, R., Rabinowitz, C., & Gonnella, J. S. (2011). Physicians' empathy and clinical outcomes for diabetic patients. *Academic Medicine, 86*(3), 359-364. doi:10.1097/ACM.0b013e3182086fe1

Hospice Friendly Hospitals. *How Do I Break Bad News?* Retrieved from http://hospicefoundation.ie/wp-content/uploads/2013/04/How-Do-I-Break-Bad-News.pdf.

ISO. (1998). Ergonomic requirements for office work with visual display terminals (VDTs) — Part 11: Guidance on usability. Retrieved from https://www.iso.org/obp/ui/#iso:std:iso:9241:-11:ed-1:v1:en

Kim, S. S., Kaplowitz, S., & Johnston, M. V. (2004). The effects of physician empathy on patient satisfaction and compliance. *Evaluation & the Health Professions, 27*(3), 237-251. doi:10.1177/0163278704267037

Kreps, G. L., & Neuhauser, L. (2013). Artificial intelligence and immediacy: designing health communication to personally engage consumers and providers. *Patient Educ Couns, 92*(2), 205-210. doi:10.1016/j.pec.2013.04.014

Kreuter, M. W., Farrell, D. W., Olevitch, L. R., & Brennan, L. K. (2013). *Tailoring health messages: Customizing communication with computer technology*: Mahwah, N.J.

Lin, C. A., Neafsey, P. J., & Strickler, Z. (2009). Usability testing by older adults of a computer-mediated health communication program. *Journal of Health Communication: International Perspectives, 14*(2), 102-118. doi:10.1080/10810730802659095

Liu, X., Sawada, Y., Takizawa, T., Sato, H., Sato, M., Sakamoto, H., . . . Sakamaki, T. (2007). Doctor-Patient Communication: A Comparison betweenTelemedicine Consultation and Face-to-Face Consultation. *Internal Medicine, 46*(5), 227-232. doi:10.2169/internalmedicine.46.1813

Melenhorst, A. S., Rogers, W. A., & Bouwhuis, D. G. (2006). Older adults' motivated choice for technological innovation: evidence for benefit-driven selectivity. *Psychol Aging, 21*(1), 190-195. doi:10.1037/0882-7974.21.1.190

Morris, A., Goodman, J., & Brading, H. (2007). Internet use and non-use: views of older users. *Universal Access in the Information Society, 6*(1), 43-57.

Nahm, E. S., Preece, J., Resnick, B., & Mills, M. E. (2004). Usability of health Web sites for older adults: a preliminary study. *CIN: Computers, Informatics, Nursing, 22*(6), 326-334; quiz 335-326.

Neuhauser, L., & Kreps, G. L. (2010). eHealth communication and behavior change: promise and performance. *Social Semiotics, 20*(1), 9-27. doi:10.1080/10350330903438386

Neuman, T., Cubanski, J., Huang, J., & Damico, A. (2015). *The Rising Cost of Living Longer*. Retrieved from

Newell, A., Arnott, A., Carmichael, A., & Morgan, M. (2007). Methodologies for involving older adults in the design process. In C. Stephanidis (Ed.), *Universal Access in Human Computer Interaction: Coping with Diversity, Pt 1* (Vol. 4554, pp. 982-989): Springer Berlin Heidelberg.

Nielsen, J. (1993). *Usability engineering*. Boston, MA: Academic Press, Inc.

Nyman, S. R., & Yardley, L. (2009). Usability and acceptability of a website that provides tailored advice on falls prevention activities for older people. *Health Informatics Journal, 15*(1), 27-39. doi:10.1177/1460458208099866

O'Caoimh, R., van Velsen, L., Dekker, M., Jansen, S., Cabrita, M., Rauter, A., . . . Vollenbroek, M. (2014). *Deliverable 2.1 - Shared vision regarding the screening of frailty and triage to training services*. Retrieved from http://perssilaa.rrdweb.nl/wp-content/uploads/2015/04/d2.1.pdf

Perssilaa. (2014). Retrieved from www.rrd.nl/projects/cluster_telemedicine/perssilaa

Petty, R. E., & Cacioppo, J. T. (1981). *Attitudes and persuasion: Classic and contemporary approaches*: Dubuque, IA: Brown.

Ptacek, J. T., & Eberhardt, T. L. (1996). Breaking bad news: a review of the literature. *JAMA, 276*(6), 496-502. Retrieved from http://jama.jamanetwork.com/article.aspx?articleid=406422

Rogers, E. M. (2003). *Diffusion of Innovations*. New York: Free Press.

Ryan, P., & Lauver, D. R. (2002). The efficacy of tailored interventions. *Journal of Nursing Scholarship, 34*(4), 331-337. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12501736

Salthouse, T. A. (1985). *A theory of cognitive aging*. Amsterdam: North Holland.

Salthouse, T. A. (1996). The processing-speed theory of adult age differences in cognition. *Psychological Review, 103*(3), 403.

Shaw, W. S., Zaia, A., Pransky, G., Winters, T., & Patterson, W. B. (2005). Perceptions of provider communication and patient satisfaction for treatment of acute low back pain. *Journal of Occupational and Environmental Medicine, 47*(10), 1036-1043.

Stemler, S. (2001). An overview of content analysis. *Practical assessment, research & evaluation, 7*(17), 137-146.

Strehle, E. M., & Shabde, N. (2006). One hundred years of telemedicine: does this new technology have a place in paediatrics? *Archives of Disease in Childhood, 91*(12), 956-959. doi:10.1136/adc.2006.099671

Strickler, Z., & Neafsey, P. J. (2002). Visual design of interactive software for older adults: Preventing drug interactions in older adults. *Visible Language, 36*(1), 4-28.

Tattersall, M. H. N., Butow, P. N., Griffin, A. M., & Dunn, S. M. (1994). The takehome message: Patients prefer consultation audiotapes to summary letters. *Journal of Clinical Oncology, 12*, 1305-1311.

Terry, C., & Cain, J. (2016). The Emerging Issue of Digital Empathy. *American Journal of Pharmaceutical Education, 80*(4).

The National Institute on Aging, & The National Library of Medicine. (2009). *Making your website senior friendly*. Retrieved from www.nia.nih.gov/sites/default/files/making_your_website_senior_friendly.pdf.

Thorne, S., Hislop, T. G., Kuo, M., & Armstrong, E. A. (2006). Hope and probability: patient perspectives of the meaning of numerical information in cancer communication. *Qualitative Health Research, 16*(3), 318-336. doi:10.1177/1049732305285341

van der Geest, T. (2006). Conducting Usability Studies with Users Who Are Elderly or Have Disabilities. *Technical Communication, 53*(1), 23-31.

van Velsen, L., Illario, M., Jansen-Kosterink, S., Crola, C., Di Somma, C., Colao, A., & Vollenbroek-Hutten, M. (2015). A Community-Based, Technology-Supported Health Service for Detecting and Preventing Frailty among Older Adults: A Participatory Design Development Process. *J Aging Res, 2015*, 216084. doi:10.1155/2015/216084

Wagner, N., Hassanein, K., & Head, M. (2010). Computer use by older adults: A multi-disciplinary review. *Computers in Human Behavior, 26*(5), 870-882. doi:10.1016/j.chb.2010.03.029

World Health Organization. (2010). Telemedicine, Opportunities and developments in Member States. Retrieved from http://www.who.int/goe/publications/goe_telemedicine_2010.pdf

V. Appendici

V.I. Appendix A - Usability protocol

Stap 1: introduceren
"Allereerst bedankt dat u mee wilt doen met dit onderzoek. Mijn naam is Sander Beukema en ben student aan de Universiteit Twente. Voor het eindonderzoek van mijn studie voer ik dit onderzoek uit. Het doel van dit onderzoek is om langgezond.nl technisch te verbeteren. Tijdens dit onderzoek zal ik een geluidsrecorder gebruiker welke ik straks zal starten. Deze data zal alleen door mij gebruikt worden en zal vertrouwelijk behandeld worden. De resultaten van het onderzoek zullen geanonimiseerd worden voor het gebruik ervan in mijn onderzoek. Vind u het goed als ik geluidsopnamen maak van het onderzoek?
De bedoeling van deze test is dat u de vragenlijst invult. Ik wil u vragen om tijdens het invullen van de vragenlijst hardop te verwoorden wat u denkt, en waarom u voor een bepaald antwoord kiest. Dit kan in het begin wat onwennig zijn, maar op deze manier krijg ik inzicht in hoe u het ervaart om de vragenlijst in te vullen. Ook dingen die u opvalt mag u hardop benoemen. Als u vragen heeft tijdens het invullen mag u die aan mij stellen en dan zal ik proberen deze te beantwoorden. U kunt het bijvoorbeeld vragen als iets onduidelijk is.
Door dit onderzoek wil ik langgezond.nl technisch verbeteren. Mij gaat het erom dat u verwoord wat voor problemen er zijn tijdens het invullen van de vragenlijst. Als er bepaalde onderdelen moeilijk te begrijpen zijn voor u, geld dat ook voor andere gebruikers, dus geef dat dan ook aan alstublieft.
Maar het is belangrijk voor u om te beseffen dat u dit onderzoek voor **uzelf** invult. De uitslag die u aan het eind krijgt is dus ook voor u. Ik wil benadrukken dat uw deelname vrijwillig is, dus als u op een bepaald moment wilt stoppen of een pauze wilt dan mag dat uiteraard!
Is tot zover alles duidelijk wat u moet doen?"
Ruimte laten voor vragen. Mogelijk de procedure opnieuw uitleggen.

Stap 2: Consent
"Voordat we gaan beginnen met het onderzoek wil ik u vragen of u het eens bent met het onderzoek?
Wachten op antwoord. Indien dingen onduidelijk zijn verhelderen. Als de deelnemer niet mee wil doen stopt hier het onderzoek en kan de deelnemer de vragenlijst zelf gaan invullen.
Indien deelnemer instemt met het onderzoek: formulier ondertekenen
"Voordat het onderzoek begint heb ik een formulier voor u wat u moet ondertekenen. Door dit te ondertekenen gaat u er mee akkoord dat **...**
Formulier laten ondertekenen
Heeft u nog vragen voordat we gaan beginnen?"
Ruimte laten voor vragen

Stap 4: De vragenlijst

Stap 4a: Invullen
"Als het goed is heeft u de brief meegenomen die u thuisgestuurd gekregen heeft. Hierop staat een huisartscode die u zometeen nodig heeft. Zou u de brief willen pakken"
Laat de deelnemer de brief pakken.

"Dan ga ik u nu vragen of u wilt beginnen met het invullen van de vragenlijst. Hiervoor gaat u naar langergezond.nl. Daarna zou alles zichzelf moeten wijzen. Als u de uitslag voor u heeft, en u heeft deze doorgenomen geeft u dat aan. En vergeet vooral niet om hardop te denken."
Laat de deelnemer inloggen, en de vragenlijst invullen.
Als de deelnemer niet hardop denkt, geef dit aan: Ik merk dat u niet hardop denkt, zou u dat wel willen doen?
Als de deelnemer vragen stelt, probeer deze te beantwoorden. Ga geen antwoorden voorkauwen, maar probeer duidelijk te maken waar de deelnemer uit kan kiezen.
Als een deelnemer een probleem heeft kan er gevraagd worden hoe hij/zij dit opgelost zou hebben als de onderzoeker niet aanwezig was.
Als de deelnemer klaar is met invullen en de uitslag doorgenomen heeft:
"U bent nu aan het einde van de vragenlijst gekomen en heeft een uitslag gekregen. Heeft u de uitslag doorgenomen?" *Ja/nee?*

Stap 4b: De uitslag
"Wat vind u van deze uitslag?"
"Heeft u vragen over de uitslag?"
Geeft antwoord op de vragen waar mogelijk.
"Zijn er nog dingen onduidelijk over de uitslag?"
"Dan wil ik u nu wat vragen stellen over de manier waarop de uitslag naar u word gecommuniceerd. Hoe vind u dat deze uitslag word gecommuniceerd naar u?"
Wat vind u ervan dat de computer deze uitslag geeft?
Hoe vind u de verwoording van de tekst?
"Bedankt voor uw reactie op de vragenlijst en de uitslag."

Stap 5: Interview over uitslagen
"U heeft net een uitslag gekregen. Maar afhankelijk van hoe de vragenlijst is ingevuld zijn er verschillende uitkomsten mogelijk. Ik zal u nu twee mogelijke andere uitslag voorleggen. Deze uitslagen zijn **niet** op u van toepassing, maar ik zou graag uw mening hierover willen."
Presenteer de uitslagen in random volgorde

Stap 5a: uitslag 1
Presenteer de eerste uitslag.
"Ik zou graag willen dat u deze uitslag aandachtig doorneemt en zich voorstelt dat deze uitslag op u van toepassing is."
Wat zou u ervan vinden als u deze uitslag krijgt?
Wat voor vragen roept deze uitslag bij u op?
Hoe vind u dat deze uitslag wordt gecommuniceerd?
Wat zou u veranderen aan deze uitslag?

Stap 5b: uitslag 2
Presenteer de tweede uitslag. Herhaal stap 5a.

Stap 6: Einde
"Dit is bijna het einde van het onderzoek. Ik heb alleen nog wat algemene vragen voor u.
"Wat vond u het beste en het slechtste aan de website?"
"Zijn er nog opmerkingen die u wilt maken?"
"Ik wil u graag hartelijk bedanken voor uw medewerking aan dit onderzoek. De resultaten ga ik verwerken in mijn onderzoek, maar zal ik uiteraard vertrouwelijk en anoniem verwerken. "

V.II.   Appendix B - Survey

Vragenlijst

De vragenlijst kunt u ook op het internet invullen. Bezoekt u hiervoor de website: www.langgezond.nl

Naam: _____

Adres: _____

_____

Tel: _____

Email: _____

Datum: ____ - ____ - _____

Huisarts: _____

__Invulinstructie__

➢ Volg de instructies bij de vragen op.

➢ Neem rustig de tijd voor het invullen.

➢ Lees per vraag eerst de antwoorden goed door voordat u de vraag beantwoordt.

➢ U mag (meestal) maar één antwoord geven: kies het antwoord dat het beste bij uw situatie past. Meestal is dit het antwoord dat het eerste bij u opkomt.

➢ Soms mag u meerdere antwoorden geven, dit staat dan bij de vraag aangegeven.

➢ Het kan voorkomen dat bepaalde vragen op elkaar lijken.

➢ Het is belangrijk dat u alle vragen invult, ook al lijken de vragen op elkaar of vindt u het soms moeilijk om een antwoord te geven.

➢ Er zijn geen goede en foute antwoorden. Het gaat om uw mening en ervaring!

➢ Bent u klaar met invullen? Kijk dan of u geen vragen vergeten bent.

__Algemene gegevens__

1. **Bent u man of vrouw?**
   - ☐ Man
   - ☐ Vrouw

2. **Wat is uw geboortedatum?** ____ - ____ - _____

3. **Wat is uw lengte (in meters)?** _____

4. **Wat is uw gewicht (in kg)?** _____

5. **Wat is de hoogste opleiding die u afgerond heeft?**
   - ☐ Geen
   - ☐ Basisschool
   - ☐ Middelbare school (MAVO, HAVO, VWO)
   - ☐ LBO
   - ☐ MBO
   - ☐ HBO
   - ☐ Universiteit
   - ☐ Anders, namelijk _____

6. **Wat is uw huidige leefsituatie?**
   - ☐ Alleen
   - ☐ Met iemand anders (partner, kinderen, andere familie of kennissen)

7. **Heeft u thuis een PC/ laptop tot uw beschikking?**
   - ☐ Ja
   - ☐ Nee

8. **Heeft u thuis toegang tot het internet?**
   - ☐ Ja
   - ☐ Nee

9. **Hoeveel alcoholische consumpties nuttigt u gemiddeld per dag?**

   _____

10. **Bent u verantwoordelijk voor uw eigen (financiële) administratie?**

☐ Ja

☐ Nee

11. Rookt u momenteel?

☐ Ja. Hoeveel sigaretten rookt u gemiddeld per dag? _____

☐ Nee

12. Gebuikt u (af en toe) softdrugs (zoals cannabis)?

☐ Ja

☐ Nee

Lichamelijke gezondheid

De volgende vragen gaan over uw lichamelijke gezondheid.

13. Wat vindt u, over het algemeen genomen, van uw gezondheid?

☐ Uitstekend

☐ Zeer goed

☐ Goed

☐ Matig

☐ Slecht

14. In welke mate bent u de afgelopen 4 weken door pijn gehinderd in uw normale werk (zowel werk buitenshuis als huishoudelijk werk)?

☐ Helemaal niet

☐ Een klein beetje

☐ Nogal

☐ Nogal veel

☐ Heel erg veel

15. In hoeverre bent u in staat tot bewegen (mobiliteit)?

☐ Ik ben aan bed of stoel gebonden

☐ Ik ben in staat zelfstandig uit bed/stoel te komen, maar ik ga niet naar buiten

☐ Ik ga zelfstandig naar buiten

16. De volgende vragen gaan over uw dagelijkse bezigheden. Wordt u door uw gezondheid op dit moment beperkt bij deze bezigheden? Zo ja, in welke mate?

A. Forse inspanning zoals hardlopen, zware voorwerpen tillen, inspannend sporten

☐ Ja, ernstig beperkt

☐ Ja, een beetje beperkt
☐ Nee, helemaal niet beperkt

B. Matige inspanning zoals het verplaatsen van een tafel, stofzuiger, fietsen

☐ Ja, ernstig beperkt
☐ Ja, een beetje beperkt
☐ Nee, helemaal niet beperkt

C. Tillen of boodschappen dragen

☐ Ja, ernstig beperkt
☐ Ja, een beetje beperkt
☐ Nee, helemaal niet beperkt

D. Een paar trappen oplopen

☐ Ja, ernstig beperkt
☐ Ja, een beetje beperkt
☐ Nee, helemaal niet beperkt

E. Eén trap oplopen

☐ Ja, ernstig beperkt
☐ Ja, een beetje beperkt
☐ Nee, helemaal niet beperkt

F. Buigen, knielen of bukken

☐ Ja, ernstig beperkt
☐ Ja, een beetje beperkt
☐ Nee, helemaal niet beperkt

G. Meer dan een kilometer lopen

☐ Ja, ernstig beperkt
☐ Ja, een beetje beperkt
☐ Nee, helemaal niet beperkt

H. Een halve kilometer lopen

☐ Ja, ernstig beperkt
☐ Ja, een beetje beperkt
☐ Nee, helemaal niet beperkt

I. Honderd meter lopen

☐ Ja, ernstig beperkt
☐ Ja, een beetje beperkt
☐ Nee, helemaal niet beperkt

J. Uzelf wassen of aankleden

☐ Ja, ernstig beperkt
☐ Ja, een beetje beperkt
☐ Nee, helemaal niet beperkt

17. **Had u, ten gevolge van uw lichamelijke gezondheid, de afgelopen 4 weken één van de volgende problemen bij uw werk of dagelijkse bezigheden?**

    A. **U heeft minder bereikt dan u zou willen**

        ☐ Ja

        ☐ Nee

    B. **U was beperkt in het soort werk of het soort bezigheden**

        ☐ Ja

        ☐ Nee

18. **Ondervindt u problemen in het dagelijks leven doordat u slecht ziet?**

    ☐ Ja

    ☐ Nee

19. **Ondervindt u problemen in het dagelijks leven doordat u slecht hoort?**

    ☐ Ja

    ☐ Nee

20. **Als u een rapportcijfer zou moeten geven voor uw lichamelijke fitheid, waarbij een 1 staat voor '*heel slecht*', en een 10 staat voor '*uitstekend*', wat zou dit cijfer dan zijn?**

_____

21. **Bent u de afgelopen 6 maanden veel afgevallen zonder dat u dat wilde?**

    ☐ Ja

    ☐ Nee

22. **Bent u de afgelopen 3 maanden minder gaan eten als gevolg van verminderde eetlust, spijsverteringsproblemen, problemen bij het kauwen en/of slikken?**

    ☐ Aanzienlijk minder gaan eten (sterk verminderde eetlust)

    ☐ Een beetje minder gaan eten (matige verminderde eetlust)

    ☐ Niet minder gaan eten (geen verminderde eetlust)

23. **Wat is uw gewichtsverlies gedurende de afgelopen maanden?**

    ☐ Gewichtsverlies groter dan 3 kg

    ☐ Weet ik niet

    ☐ Gewichtsverlies tussen 1 en 3 kg

    ☐ Geen gewichtsverlies

Geestelijke gezondheid

De volgende vragen gaan over uw geestelijke gezondheid

24. **Had u, ten gevolge van een emotioneel probleem (bijvoorbeeld doordat u zich depressief of angstig voelde), de afgelopen 4 weken één van de volgende problemen bij uw werk of dagelijkse bezigheden?**
    A. **U heeft minder bereikt dan u zou willen**
       ☐ Ja
       ☐ Nee
    B. **U heeft het werk of andere bezigheden niet zo zorgvuldig gedaan als u gewend bent**
       ☐ Ja
       ☐ Nee

25. **Heeft u gedurende de afgelopen 3 maanden last gehad van psychische stress of een ernstige ziekte?**
    ☐ Ja
    ☐ Nee

26. **Ondervindt u neuropsychologische problemen?**
    ☐ Ernstig dement of depressief
    ☐ Licht dement
    ☐ Geen psychologische problemen

27. **Heeft u klachten over uw geheugen?**
    ☐ Nee
    ☐ Soms
    ☐ Ja

28. **Heeft u zich de laatste tijd somber of neerslachtig gevoeld?**
    ☐ Nee
    ☐ Soms
    ☐ Ja

29. **Heeft u zich de laatste tijd nerveus of angstig gevoeld?**
    ☐ Nee
    ☐ Soms
    ☐ Ja

30. **Deze vragen gaan over hoe u zich de afgelopen 4 weken heeft gevoeld. Wilt u bij iedere vraag aangeven welk antwoord het best aansluit bij hoe u zich heeft gevoeld?**

    A. **Voelde u zich kalm en rustig?**
- ☐ Voortdurend
- ☐ Meestal
- ☐ Vaak
- ☐ Soms
- ☐ Zelden
- ☐ Nooit

    B. **Voelde u zich erg energiek?**
- ☐ Voortdurend
- ☐ Meestal
- ☐ Vaak
- ☐ Soms
- ☐ Zelden
- ☐ Nooit

    C. **Voelde u zich neerslachtig en somber?**
- ☐ Voortdurend
- ☐ Meestal
- ☐ Vaak
- ☐ Soms
- ☐ Zelden
- ☐ Nooit

31. **Heeft u problemen met het nemen van beslissingen?**
- ☐ Ja
- ☐ Nee
- ☐ Ik weet het niet

32. **Heeft u minder belangstelling voor hobby's en / of activiteiten?**
- ☐ Ja
- ☐ Nee
- ☐ Ik weet het niet

33. **Betrapt u uzelf er wel eens op dat u tijdens een gesprek dezelfde vragen, verhalen of standpunten herhaalt of niet meer weet of u iets al verteld heeft?**
- ☐ Ja
- ☐ Nee

☐ Ik weet het niet

34. Heeft u moeite met het leren gebruiken van een nieuw apparaat zoals; een magnetron, een afstandsbediening of een computer?

☐ Ja
☐ Nee
☐ Ik weet het niet

35. Vergeet u wel eens wat de correcte maand of het correcte jaar is?

☐ Ja
☐ Nee
☐ Ik weet het niet

36. Heeft u moeite met het goed afhandelen van financiële aangelegenheden; zoals het betalen aan de kassa, het bijhouden van het huishoudboekje of het betalen van rekeningen?

☐ Ja
☐ Nee
☐ Ik weet het niet

37. Heeft u moeite met het herinneren van afspraken?

☐ Ja
☐ Nee
☐ Ik weet het niet

38. Heeft u dagelijks problemen met nadenken of uw geheugen?

☐ Ja
☐ Nee
☐ Ik weet het niet

Relaties met anderen

De volgende vragen gaan over uw relaties met anderen

39. Ervaart u wel eens een leegte om u heen?

☐ Nee
☐ Soms
☐ Ja

40. Mist u wel eens mensen om u heen?

☐ Nee
☐ Soms

☐   Ja

41.   Voelt u zich wel eens in de steek gelaten?

☐   Nee
☐   Soms
☐   Ja

42.   Hoe vaak hebben uw lichamelijke gezondheid of emotionele problemen u gedurende de afgelopen 4 weken bij uw sociale activiteiten (zoals bezoek aan familie en vrienden etc.) belemmerd.

☐   Voortdurend
☐   Meestal
☐   Vaak
☐   Soms
☐   Zelden
☐   Nooit

Jezelf kunnen redden

De volgende vragen gaan over hoe u uzelf kunt redden

43.   Kunt u zonder enige hulp van iemand anders zelfstandig de volgende activiteiten uitvoeren, eventueel met behulp van stok, rollator of rolstoel?

A.   Boodschappen doen

☐   Ja
☐   Nee

B.   Buitenshuis rondlopen (rondom huis of naar de buren)

☐   Ja
☐   Nee

C.   Aan- en uitkleden

☐   Ja
☐   Nee

D.   Naar toilet gaan

☐   Ja
☐   Nee

Gebruik gezondheidzorg

De volgende vragen gaan over uw gebruik van de gezondheidzorg

44. **Gebruikt u op dit moment 4 of meer verschillende soorten medicijnen?**

☐ Ja
☐ Nee

45. **Bij wie bent u onder behandeling of van wie ontvangt u zorg? (meerdere antwoorden mogelijk)**

A. **Huisarts**	☐ Ja	☐ Nee
B. **Verpleeghuisarts**	☐ Ja	☐ Nee
C. **Een specialist (bijv. longarts, cardioloog, chirurg) voor lichamelijke klachten)**	☐ Ja	☐ Nee
D. **Meerdere specialisten voor lichamelijke klachten**	☐ Ja	☐ Nee
E. **Psycholoog**	☐ Ja	☐ Nee
F. **Diëtist**	☐ Ja	☐ Nee
G. **Maatschappelijk werker**	☐ Ja	☐ Nee
H. **Fysiotherapeut**	☐ Ja	☐ Nee
I. **Logopedist**	☐ Ja	☐ Nee
J. **Verpleegkundige/verzorgende thuiszorg**	☐ Ja	☐ Nee
K. **Verpleegkundige bij de huisarts (praktijkverpleegkundige)**	☐ Ja	☐ Nee
L. **Verpleegkundige in ziekenhuis (verpleegkundig specialist)**	☐ Ja	☐ Nee
M. **Verzorgenden in verpleeghuis of verzorgingshuis**	☐ Ja	☐ Nee
N. **Ik ben de afgelopen maand opgenomen of ontslagen uit het ziekenhuis, verpleeg- of verzorgingshuis**	☐ Ja	☐ Nee

O. **Heeft u andere zorg ontvangen?**
☐ Ja, namelijk _____
☐ Nee

Tot Slot

1. **Ik geef <u>toestemming</u> voor het gebruik van de door mij ingevulde vragenlijst voor onderzoeksdoeleinden.**
   - ☐ Ja
   - ☐ Nee

2. **Wilt u hier de datum invullen waarop u deze vragenlijst heeft <u>afgerond</u>?**

   ____ - ____ - _____

3. **Heeft iemand u geholpen bij het invullen van deze vragenlijst?**
   - ☐ Ja, iemand heeft mij geholpen met het invullen van de lijst.
   - ☐ Nee, ik heb de lijst alleen ingevuld → **U bent klaar met invullen!**

4. **Zo ja, waaruit bestond de hulp?**
   - ☐ Iemand anders heeft de antwoorden genoteerd; ik heb de antwoorden zelf gekozen
   - ☐ Ik heb de antwoorden samen met iemand gekozen en genoteerd
   - ☐ Iemand heeft de antwoorden voor mij gekozen en genoteerd

5. **Als u geholpen werd bij het invullen van de vragenlijst of de vragenlijst werd door een ander ingevuld, wie was dit dan?**
   - ☐ Partner
   - ☐ Familielid
   - ☐ Zorgverlener
   - ☐ Onderzoeker
   - ☐ Anders, namelijk _____

6. **Ruimte voor overige opmerkingen:**

   _____

   _____

Blader nog even door de vragenlijst. Heeft u alle vragen ingevuld? Dan bent u klaar met het invullen van de vragenlijst. U kunt de vragenlijst terugsturen in de bijgevoegde antwoordenvelop.

Bedankt voor uw medewerking.
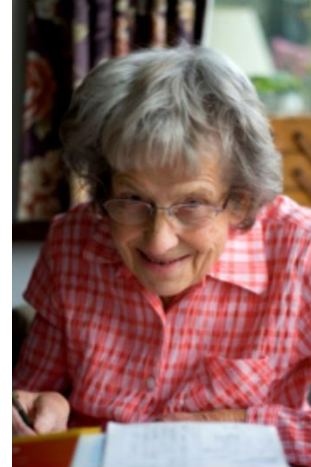
V.III. Appendix C - Scenario's

V.III.I. Frail Scenario
Ans Jansen

Dit is Ans Jansen. Onlangs is zij 75 jaar geworden. Voor haar pensioen werkte ze als administratief medewerker bij een warenhuis. De man van Ans is 3 jaar geleden overleden. Haar dochter woont in het zuiden van het land. Daarom zien zij elkaar weinig, maar gelukkig spreken ze elkaar wekelijks aan de telefoon.
Ans heeft van haar huisarts een brief ontvangen met de vraag om een vragenlijst in te vullen. Deze vragenlijst kan ook online ingevuld worden. Toevallig komt de wekelijkse hulp langs. Zij helpt Ans met het invullen van de online vragenlijst.
Na het invullen krijgt Ans de uitslag direct te zien. De uitslag is niet goed. Daarom wordt Ans uitgenodigd om bij de huisarts langs te komen om de uitslag te bespreken. Ans had de slechte uitslag niet verwacht, en ze wil toch graag bij de huisarts langs gaan.

V.III.II. Pre-Frail Scenario
Ans Jansen

Dit is Ans Jansen. Onlangs is zij 69 jaar geworden. Voor haar pensioen werkte ze als administratief medewerker bij een warenhuis. Ze woont samen met haar man Rob in een huis met grote tuin. Vroeger vond ze het heerlijk om in de tuin te werken, maar door lichamelijke klachten kost dat de laatste tijd meer moeite.
Ans heeft van haar huisarts een brief ontvangen met de vraag om een vragenlijst in te vullen. Deze vragenlijst kan ook online ingevuld worden en omdat Ans net een computercursus heeft afgesloten besluit ze de vragenlijst online in te vullen.
Na het invullen krijgt Ans de uitslag direct te zien. Zij wordt uitgenodigd voor een extra afspraak omdat er getwijfeld wordt aan de gezondheid van Ans. Dit had Ans niet verwacht, maar ze wil wel graag meewerken.
Tijdens deze extra afspraak wordt een aantal testen gedaan om het geheugen, beweging en voeding te testen.
Ans vindt de geheugentesten niet moeilijk, maar heeft wel moeite met de bewegingstesten. Daarom krijgt ze het aanbod om deel te nemen aan een beweegprogramma. Hierdoor werkt Ans nu elke week aan haar lichamelijke gezondheid.

 V.III.III. Robust Scenario
Ans Jansen

Dit is Ans Jansen. Onlangs is zij 69 jaar geworden. Voor haar pensioen werkte ze als administratief medewerker bij een warenhuis. Ze woont samen met haar man Rob in een huis met grote tuin. Ze geniet nog steeds elke dag van de tuin en er komen regelmatig familie en vrienden langs. Bij lekker weer zitten ze met z'n allen in de tuin.
Ans heeft van haar huisarts een brief ontvangen met de vraag om een vragenlijst in te vullen. Deze vragenlijst kan ook online ingevuld worden en omdat Ans net een computercursus heeft afgesloten besluit ze de vragenlijst online in te vullen.
Na het invullen krijgt Ans de uitslag direct te zien. De uitslag is positief en Ans wordt uitgenodigd om over een jaar nog eens de vragenlijst in te vullen. Hier is Ans natuurlijk heel blij mee. Ze werkt volgend jaar graag weer mee.

V.IV. Appendix D - Interview protocol second study

Introduceren

Allereerst bedankt dat ik u mag interviewen voor mijn onderzoek. Mijn naam is Sander Beukema en ben student aan de Universiteit Twente. Voor het eindonderzoek van mijn studie voer ik dit onderzoek uit. Het doel van dit onderzoek is om te achterhalen hoe informatie over uw gezondheid online gepresenteerd zou moeten worden.

Tijdens dit onderzoek zal ik een geluidsrecorder gebruiker welke ik straks zal starten. Deze data zal alleen door mij gebruikt worden en zal vertrouwelijk behandeld worden. De resultaten van het onderzoek zullen geanonimiseerd worden voor het gebruik ervan in mijn onderzoek. Vind u het goed als ik geluidsopnamen maak van het onderzoek?

Ik zal eerst uitleggen waar mijn onderzoek over gaat. Mijn onderzoek gaat over online gezondheidscommunicatie. Dit doe ik voor een project genaamd langgezond. Dit is gemaakt voor mensen tussen de 65 en de 75 jaar. De bedoeling is dat zij een vragenlijst over hun gezondheid invullen en dan een advies krijgen over hun gezondheid. Dit kan zijn dat ze gezond zijn, dan worden ze volgend jaar opnieuw uitgenodigd om mee te doen met de vragenlijst. Maar het kan ook zijn dat uit de vragenlijst blijkt dat er iets mis is met de deelnemer en dan wordt de deelnemer verzocht om contact op te nemen met de huisarts. Als laatste optie is er de twijfel. Dan kan de er uit de vragenlijst niet duidelijk geconcludeerd worden of de deelnemer wel of niet gezond is. Dan wordt deze deelnemer uitgenodigd voor een tweede onderzoek bij hem of haar in de buurt. Hier worden dan verschillende testjes uitgevoerd, en krijgt deze persoon tips om zijn of haar gezondheid te verbeteren.

Als de deelnemer dus die vragenlijst heeft ingevuld via de computer krijgt deze direct de uitslag te zien. Maar nu is er dus aan mij gevraagd hoe deze uitslag gecommuniceerd moet worden. Hiervoor heb ik verschillende versies gemaakt met verschillende onderdelen.

De bedoeling van dit interview is dat ik de verschillende versies van deze uitslagen aan voor ga leggen. Ik vraag om uw reactie en welke u het beste vind.

Consent

Voordat we gaan beginnen met het interview wil ik u vragen of u het eens bent met het interview?
Formulier ondertekenen.
Heeft u nog vragen voordat we gaan beginnen?

Uitleg

Dan ga ik nu een voor een de uitslagen voorleggen. De uitslagen zijn niet op u van toepassing maar zijn fictief. In de uitslagen gaat het om mevrouw Ans Jansen. Zij is uitgenodigd om mee te doen en heeft de vragenlijst over haar gezondheid ingevuld. Ze is 69 jaar oud en haar huisarts is dokter Frederiksen.

Vragen

Eén voor één de uitslagen presenteren en de volgende vragen stellen.
Wat vindt u van deze uitslag?
Hoe vindt u de verwoording van de tekst?
Probe: *Persoonlijk/onpersoonlijk?*
Wat vindt u van dit stuk? *(Empatische elementen)*
Wat vindt u van dit stuk? *(Tailorde elementen)*

Vindt u deze uitslag beter of slechter dan de vorige versie?
Wat zou er anders moeten aan deze uitslag?
Na de vier versies:
Leg nu de versie op volgorde van minst favoriet naar meest favoriet.
Waarom deze volgorde?
Wat zou er verbeterd moeten worden aan de favoriete uitslag om hem nog beter te maken?

V.V.   Appendix E - Overview of the feedback screens

V.V.I.   Robust outcomes

Original version

Uitslag

Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Dit leidt tot de volgende uitslag.

✔ Algemene gezondheid

U heeft verschillende vragen positief beantwoord over uw algemene gezondheid en daarom concluderen wij dat dit goed is.

✔ Gezondheid van uw hersenen

U heeft verschillende vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

✔ Gezonde voeding

U heeft verschillende vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

✔ Gezondheid van uw lichaam

U heeft verschillende vragen positief beantwoord over de gezondheid van uw lichaam en daarom concluderen wij dat dit goed is.

Uit uw antwoorden blijkt dat uw gezondheid prima in orde is. We willen u hartelijk bedanken voor uw deelname. Deze vragenlijst wordt jaarlijks verspreid en daarom zult u volgend jaar opnieuw uitgenodigd worden om deel te nemen. Deze uitslag wordt ook doorgestuurd naar uw huisarts.
Ook ontvangt u binnenkort een kopie van deze uitslag op uw e-mailadres.

Tot volgend jaar!

Empathic version

Uitslag

Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Dit leidt tot de volgende uitslag.

✔ Algemene gezondheid

U heeft verschillende vragen positief beantwoord over uw algemene gezondheid en daarom concluderen wij dat dit goed is.

✔ Gezondheid van uw hersenen

U heeft verschillende vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

✔ Gezonde voeding

U heeft verschillende vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

✔ Gezondheid van uw lichaam

U heeft verschillende vragen positief beantwoord over de gezondheid van uw lichaam en daarom concluderen wij dat dit goed is.

Uit uw antwoorden blijkt dat uw gezondheid prima in orde is. Dit is uiteraard goed nieuws waar u waarschijnlijk blij mee bent. We willen u hartelijk bedanken voor uw deelname. Deze vragenlijst wordt jaarlijks verspreid en daarom zult u volgend jaar opnieuw uitgenodigd worden om deel te nemen. Deze uitslag wordt ook doorgestuurd naar uw huisarts.
Ook ontvangt u binnenkort een kopie van deze uitslag op uw emailadres.

Tot volgend jaar!

Tailored version

Uitslag

Beste mevrouw Jansen,
Dank u wel voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Gezien uw leeftijd van 69 jaar leidt dit tot de volgende uitslag.

✔ Algemene gezondheid

U heeft onder andere aangegeven dat u niet beperkt bent bij het lopen van één kilometer. Ook heeft u andere vragen positief beantwoord over uw algemene gezondheid en daarom concluderen wij dat dit goed is.

✔ Gezondheid van uw hersenen

U heeft onder andere aangegeven geen moeite te hebben met het herinneren van afspraken. Ook heeft u andere vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

✔ Gezonde voeding

U heeft onder andere aangegeven dat u de afgelopen 6 maanden niet bent afgevallen zonder dat u dat wilde. Ook heeft u andere vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

✔ Gezondheid van uw lichaam

U geeft aan geen beperking te hebben bij het knielen en buigen. Ook heeft u andere vragen positief beantwoord over de gezondheid van uw lichaam en daarom concluderen wij dat dit goed is.

Uit uw antwoorden blijkt dat uw gezondheid prima in orde is. We willen u hartelijk bedanken voor uw deelname. Deze vragenlijst wordt jaarlijks verspreid en daarom zult u volgend jaar opnieuw uitgenodigd worden om deel te nemen. Deze uitslag wordt ook doorgestuurd naar uw huisarts Frederiksen.
Ook ontvangt u binnenkort een kopie van deze uitslag op uw emailadres (ans.jansen@gmail.com).

Tot volgend jaar!

Empathic and tailored version

Uitslag

Beste mevrouw Jansen,
Dank u wel voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Gezien uw leeftijd van 69 jaar leidt dit tot de volgende uitslag.

✔ Algemene gezondheid

U heeft onder andere aangegeven dat u niet beperkt bent bij het lopen van één kilometer. Ook heeft u andere vragen positief beantwoord over uw algemene gezondheid en daarom concluderen wij dat dit goed is.

✔ Gezondheid van uw hersenen

U heeft onder andere aangegeven geen moeite te hebben met het herinneren van afspraken. Ook heeft u andere vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

✔ Gezonde voeding

U heeft onder andere aangegeven dat u de afgelopen 6 maanden niet bent afgevallen zonder dat u dat wilde. Ook heeft u andere vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

✔ Gezondheid van uw lichaam

U geeft aan geen beperking te hebben bij het knielen en buigen. Ook heeft u andere vragen positief beantwoord over de gezondheid van uw lichaam en daarom concluderen wij dat dit goed is.

Uit uw antwoorden blijkt dat uw gezondheid prima in orde is. Dit is uiteraard goed nieuws waar u waarschijnlijk blij mee bent. We willen u hartelijk bedanken voor uw deelname. Deze vragenlijst wordt jaarlijks verspreid en daarom zult u volgend jaar opnieuw uitgenodigd worden om deel te nemen. Deze uitslag wordt ook doorgestuurd naar uw huisarts Frederiksen.
Ook ontvangt u binnenkort een kopie van deze uitslag op uw emailadres (ans.jansen@gmail.com).

Tot volgend jaar!

V.V.II.   Pre-Frail outcomes

Original version

Uitslag

Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Dit leidt tot de volgende uitslag.

✔ Algemene gezondheid

U heeft verschillende vragen positief beantwoord over uw algemene gezondheid en daarom concluderen wij dat dit goed is.

✔ Gezondheid van uw hersenen

U heeft verschillende vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

✔ Gezonde voeding

U heeft verschillende vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

❓ Gezondheid van uw lichaam

Op basis van uw antwoorden kunnen wij niet met zekerheid vaststellen hoe goed de gezondheid van uw lichaam is. Mogelijk kunnen we u helpen om de gezondheid van uw lichaam te verbeteren.

Deze uitslag wordt doorgegeven aan uw huisarts. Ook ontvangt u binnenkort een kopie van deze uitslag op uw e-mailadres.

We willen kijken of we u kunnen helpen om een gezonder lichaam te krijgen. Hiervoor wordt u binnenkort uitgenodigd voor een onderzoek op een locatie bij u in de buurt. Daar willen we graag nog enkele vragen aan u stellen en een paar onderzoeken bij u uitvoeren. Hiervoor ontvangt u binnen 5 werkdagen een uitnodiging via de post.

Empathic version

Uitslag

Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Dit leidt tot de volgende uitslag.

✔ Algemene gezondheid

U heeft verschillende vragen positief beantwoord over uw algemene gezondheid en daarom concluderen wij dat dit goed is.

✔ Gezondheid van uw hersenen

U heeft verschillende vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

✔ Gezonde voeding

U heeft verschillende vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

❓ Gezondheid van uw lichaam

Op basis van uw antwoorden kunnen wij niet met zekerheid vaststellen hoe goed de gezondheid van uw lichaam is. Mogelijk kunnen we u helpen om de gezondheid van uw lichaam te verbeteren.

Deze uitslag wordt doorgegeven aan uw huisarts. Ook ontvangt u binnenkort een kopie van deze uitslag op uw e-mailadres.

Misschien komt deze uitslag als een verrassing voor u en had u dit niet verwacht. Deze reactie is normaal, maar er is geen reden om u zorgen te maken. Wij willen u namelijk helpen om uw lichaam gezonder te maken door middel van tips en oefeningen. Dit betekent niet dat uw lichaam momenteel ongezond is, maar er is mogelijk ruimte voor verbetering.

Om te kijken of we u kunnen helpen om een gezonder lichaam te krijgen wordt u binnenkort uitgenodigd voor een onderzoek op een locatie bij u in de buurt. Daar willen we graag nog enkele vragen aan u stellen en een paar onderzoeken bij u uitvoeren. Hiervoor ontvangt u binnen 5 werkdagen een uitnodiging via de post. Misschien ziet u op tegen deze afspraak, maar deze is belangrijk voor u om een goed beeld van uw gezondheid te krijgen.

Tailored version

Uitslag

Beste mevrouw Jansen,
Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Gezien uw leeftijd van 69 jaar leidt dit tot de volgende uitslag.

✔ Algemene gezondheid

U heeft onder andere aangegeven dat u niet beperkt bent bij het lopen van één kilometer. Ook heeft u andere vragen positief beantwoord over uw algemene gezondheid waardoor wij concluderen dat dit goed is.

✔ Gezondheid van uw hersenen

U heeft onder andere aangegeven geen moeite te hebben met het herinneren van afspraken. Ook heeft u andere vragen positief beantwoord over de gezondheid van uw hersenen en concluderen wij dat dit goed is.

✔ Gezonde voeding

U heeft onder andere aangegeven dat u de afgelopen 6 maanden niet bent afgevallen zonder dat u dat wilde. Ook heeft u andere vragen positief beantwoord over gezonde voeding en concluderen wij dat dit goed is.

❓ Gezondheid van uw lichaam

U geeft aan geen beperking te hebben bij het knielen en buigen, maar niet zelfstandig boodschappen te kunnen doen. Hierdoor kunnen wij niet met zekerheid vaststellen hoe goed de gezondheid van uw lichaam is. Mogelijk kunnen we u helpen om dit te verbeteren.

Deze uitslag wordt doorgegeven aan uw huisarts Frederiksen. Ook ontvangt u binnenkort een kopie van deze uitslag op uw e-mailadres (ans.jansen@gmail.com).

Om te kijken of we u kunnen helpen om een gezonder lichaam te krijgen wordt u binnenkort uitgenodigd voor een onderzoek op een locatie bij u in de buurt. Daar willen we graag nog enkele vragen aan u stellen en een paar onderzoeken bij u uitvoeren. Hiervoor ontvangt u binnen 5 werkdagen een uitnodiging via de post.

Empathic and tailored version

Uitslag

Beste mevrouw Jansen,
Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Gezien uw leeftijd van 69 jaar leidt dit tot de volgende uitslag.

✔ Algemene gezondheid

U heeft onder andere aangegeven dat u niet beperkt bent bij het lopen van één kilometer. Ook heeft u andere vragen positief beantwoord over uw algemene gezondheid waardoor wij concluderen dat dit goed is.

✔ Gezondheid van uw hersenen

U heeft onder andere aangegeven geen moeite te hebben met het herinneren van afspraken. Ook heeft u andere vragen positief beantwoord over de gezondheid van uw hersenen en concluderen wij dat dit goed is.

✔ Gezonde voeding

U heeft onder andere aangegeven dat u de afgelopen 6 maanden niet bent afgevallen zonder dat u dat wilde. Ook heeft u andere vragen positief beantwoord over gezonde voeding en concluderen wij dat dit goed is.

❓ Gezondheid van uw lichaam

U geeft aan geen beperking te hebben bij het knielen en buigen, maar niet zelfstandig boodschappen te kunnen doen. Hierdoor kunnen wij niet met zekerheid vaststellen hoe goed de gezondheid van uw lichaam is. Mogelijk kunnen we u helpen om dit te verbeteren.

Deze uitslag wordt doorgegeven aan uw huisarts Frederiksen. Ook ontvangt u binnenkort een kopie van deze uitslag op uw e-mailadres (ans.jansen@gmail.com).

Misschien komt deze uitslag als een verrassing voor u en had u dit niet verwacht. Deze reactie is normaal, maar er is geen reden om u zorgen te maken. Wij willen u namelijk helpen om uw lichaam gezonder te maken door middel van tips en oefeningen. Dit betekent niet dat uw lichaam momenteel ongezond is, maar er is mogelijk ruimte voor verbetering.

Om te kijken of we u kunnen helpen om een gezonder lichaam te krijgen wordt u binnenkort uitgenodigd voor een onderzoek op een locatie bij u in de buurt. Daar willen we graag nog enkele vragen aan u stellen en een paar onderzoeken bij u uitvoeren. Hiervoor ontvangt u binnen 5 werkdagen een uitnodiging via de post. Misschien ziet u op tegen deze afspraak, maar deze is belangrijk voor u om een goed beeld van uw gezondheid te krijgen.

V.V.III. Frail outcomes
Original version

Uitslag

Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Dit leidt tot de volgende uitslag.

Algemene gezondheid

Op basis van uw antwoorden kunnen wij niet met zekerheid vaststellen hoe goed uw algemene gezondheid is.

Gezondheid van uw hersenen

U heeft verschillende vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

Gezonde voeding

U heeft verschillende vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

Gezondheid van uw lichaam

Op basis van uw antwoorden kunnen wij niet met zekerheid vaststellen hoe goed de gezondheid van uw lichaam is.

Uw antwoorden geven aan dat het verstandig is om uw gezondheid met uw huisarts te bespreken. Hiervoor zal de huisartsenpraktijk binnen 5 werkdagen contact met u opnemen om met u een afspraak te maken.
U ontvangt binnenkort een kopie van deze uitslag op uw emailadres.

Empathic version

Uitslag

Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Dit leidt tot de volgende uitslag.

Algemene gezondheid

Op basis van uw antwoorden kunnen wij niet met zekerheid vaststellen hoe goed uw algemene gezondheid is.

Gezondheid van uw hersenen

U heeft verschillende vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

Gezonde voeding

U heeft verschillende vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

Gezondheid van uw lichaam

Op basis van uw antwoorden kunnen wij niet met zekerheid vaststellen hoe goed de gezondheid van uw lichaam is.

Uw antwoorden geven aan dat het verstandig is om uw gezondheid met uw huisarts te bespreken. Hiervoor zal de huisartsenpraktijk binnen 5 werkdagen contact met u opnemen om met u een afspraak te maken.
U ontvangt binnenkort een kopie van deze uitslag op uw emailadres.

Misschien komt deze uitslag als een verrassing voor u en had u dit niet verwacht. Deze reactie is begrijpelijk, maar er is nog geen reden om u zorgen te maken. Deze test geeft een indruk van uw gezondheid en de huisarts zal uitgebreider naar de resultaten kijken om uw gezondheid te kunnen beoordelen. De huisarts kent u en zal uw gezondheid dus beter kunnen beoordelen.

Tailored version

Uitslag

Beste mevrouw Jansen,
Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Gezien uw leeftijd van 69 jaar leidt dit tot de volgende uitslag.

👨‍⚕️ Algemene gezondheid

U geeft aan geen dagelijkse problemen te ondervinden doordat u slecht hoort, maar minder bereikt dan u zou willen. Hierdoor kunnen wij niet met zekerheid vaststellen hoe goed uw algemene gezondheid is.

✔️ Gezondheid van uw hersenen

U heeft onder andere aangegeven geen moeite te hebben met het herinneren van afspraken. Ook heeft u andere vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

✔️ Gezonde voeding

U heeft onder andere aangegeven dat u de afgelopen 6 maanden niet bent afgevallen zonder dat u dat wilde. Ook heeft u andere vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

❓ Gezondheid van uw lichaam

U geeft aan geen beperking te hebben bij het knielen en buigen maar niet zelfstandig boodschappen te kunnen doen. Hierdoor kunnen wij niet met zekerheid vaststellen hoe goed de gezondheid van uw lichaam is.

Uw antwoorden geven aan dat het verstandig is om uw gezondheid met uw huisarts Frederiksen te bespreken. Hiervoor zal uw huisartsenpraktijk binnen 5 werkdagen contact met u opnemen om met u een afspraak te maken. U ontvangt binnenkort een kopie van deze uitslag op uw emailadres (ans.jansen@gmail.com).

Empathic and tailored version

Uitslag

Beste mevrouw Jansen,
Bedankt voor het invullen van de vragenlijst. We hebben uw antwoorden verwerkt. Gezien uw leeftijd van 69 jaar leidt dit tot de volgende uitslag.

👨‍⚕️ Algemene gezondheid

U geeft aan geen dagelijkse problemen te ondervinden doordat u slecht hoort, maar minder bereikt dan u zou willen. Hierdoor kunnen wij niet met zekerheid vaststellen hoe goed uw algemene gezondheid is.

✔️ Gezondheid van uw hersenen

U heeft onder andere aangegeven geen moeite te hebben met het herinneren van afspraken. Ook heeft u andere vragen positief beantwoord over de gezondheid van uw hersenen en daarom concluderen wij dat dit goed is.

✔️ Gezonde voeding

U heeft onder andere aangegeven dat u de afgelopen 6 maanden niet bent afgevallen zonder dat u dat wilde. Ook heeft u andere vragen positief beantwoord over gezonde voeding en daarom concluderen wij dat dit goed is.

❓ Gezondheid van uw lichaam

U geeft aan geen beperking te hebben bij het knielen en buigen maar niet zelfstandig boodschappen te kunnen doen. Hierdoor kunnen wij niet met zekerheid vaststellen hoe goed de gezondheid van uw lichaam is.

Uw antwoorden geven aan dat het verstandig is om uw gezondheid met uw huisarts Frederiksen te bespreken. Hiervoor zal uw huisartsenpraktijk binnen 5 werkdagen contact met u opnemen om met u een afspraak te maken. U ontvangt binnenkort een kopie van deze uitslag op uw emailadres (ans.jansen@gmail.com).

Misschien komt deze uitslag als een verrassing voor u en had u dit niet verwacht. Deze reactie is begrijpelijk, maar er is nog geen reden om u zorgen te maken. Deze test geeft een indruk van uw gezondheid en de huisarts zal uitgebreider naar de resultaten kijken om uw gezondheid te kunnen beoordelen. De huisarts kent u en zal uw gezondheid dus beter kunnen beoordelen.

V.VI. Appendix F - SPSS-output

Code1 * Code2 Crosstabulation

Count

		Coder_2						
		1.00	2.00	3.00	4.00	5.00	6.00	7.00
Coder_1	1.00	1	0	0	0	0	0	0
	2.00	0	3	0	1	0	1	0
	3.00	1	1	5	0	0	0	0
	4.00	0	1	0	6	0	0	0
	5.00	0	0	0	0	9	0	0
	6.00	0	0	0	0	0	1	0
	7.00	0	0	1	0	0	0	4
	8.00	0	0	0	0	0	0	0
	9.00	0	0	0	0	0	0	0
	10.00	0	0	0	0	0	0	1
	11.00	0	0	0	0	0	2	0
	12.00	0	0	0	0	0	0	0
Total		2	5	6	7	9	4	5

Code1 * Code2 Crosstabulation

Count

		Coder_2					Total
		8.00	9.00	10.00	11.00	12.00	
Coder_1	1.00	0	0	0	0	0	1
	2.00	0	0	0	0	0	5
	3.00	0	0	1	0	0	8
	4.00	0	0	0	0	0	7
	5.00	0	0	0	0	0	9
	6.00	0	0	0	1	0	2
	7.00	0	0	1	0	0	6
	8.00	3	0	1	0	0	4
	9.00	0	3	0	0	0	3
	10.00	0	0	2	0	0	3
	11.00	0	2	0	2	0	6
	12.00	0	0	2	0	6	8
Total		3	5	7	3	6	62

Page 1