‘Will they use it? A qualitative study to determine user preferences for technological support of physical activity interventions.’

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“ONDERGETEKENDE

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bevestigt hierbij dat de onderhavige verhandeling mag worden geraadpleegd en vrij mag worden gefotokopieerd. Bij het citeren moet steeds de titel en de auteur van de verhandeling worden vermeld.”

Samenvatting

Introductie: Fysieke activiteit is effectief gebleken in het voorkomen van chronische aandoeningen onder ouderen. Een manier die steeds vaker gebruikt wordt om fysieke activiteit te stimuleren is e-Health. Ondanks eerder onderzoek is het onduidelijk welke componenten van technologie bijdragen aan het succesvol gebruik van een e-Health interventie. Verschillende factoren zijn van invloed bij het gebruik van technologie: functionaliteit, gebruiksvriendelijkheid en aan leeftijd gerelateerde persoonlijke factoren zoals cognitieve vaardigheden en persoonlijke factoren.

Doel: Het bepalen van gebruikersvoorkeuren van ouderen voor het gebruik van een e-Health interventie die als doel heeft fysieke activiteit te verbeteren. Verschillende persoonlijke factoren worden bepaald om mogelijke variatie in de resultaten te verklaren.

Methode: Kwalitatief onderzoek werd toegepast volgens de methode van Grounded Theory om thema's te bepalen. Een mogelijke relatie tussen de gevonden thema's en het resultaat op de cognitieve testen werd bekeken met behulp van de mediaan.

Dataverzameling: Fysiotherapeuten die leiding gaven aan een groep beweeginterventie voor ouderen hebben de deelnemers geworven. De data werd verzameld bij de deelnemers (≥ 70 jaar, deelnemers in een beweeggroep) thuis en bestond uit interviews en het afnemen van cognitieve testen.

Data analyse: De data uit de interviews werden geanalyseerd volgens de methode van Grounded Theory tot thema's. Hier uit volgende sub thema's werden gekoppeld aan de uitslagen van de testen.

Resultaten: Data werden verzameld bij elf ouderen. Vier thema's zijn gevonden; starten met gebruik van e-Health, er even uit zijn, technologie en een algemeen thema met betrekking tot de oudere gebruiker. De voorkeur 'de technologie moet gemakkelijk in gebruik zijn' is gerelateerd aan een lage score op de test voor werkgeheugen en een sterke interne perceptie wat betreft controle over de gezondheid.

Discussie: Suggestie voor e-Health; een e-Health interventie voor ouderen zou niet gebonden moeten zijn aan één locatie, is eenvoudig in gebruik en kan aangepast worden aan de vragen en voorkeuren van de deelnemer. Gedurende implementatie wordt rekening gehouden met de leerstrategie van de deelnemer en is er een sociaal netwerk aanwezig waarin vragen gesteld kunnen worden.

Conclusie: Deze kwalitatieve studie naar de gebruikersvoorkeuren van ouderen wat betreft een e-Health interventie die zich richt op het verbeteren van fysieke activiteit heeft de volgende thema's gevonden; starten met het gebruik van e-Health, er even uit zijn,

technologie en de oudere gebruiker. Met deze thema's kan rekening gehouden worden bij de ontwikkeling van technologie die ingezet zal worden onder ouderen.

Abstract

Introduction: Physical activity has been proven effective in preventing chronic illnesses in the older population. The use of e-Health is increasingly popular way to promote or stimulate physical activity. Despite previous research, components of technology leading to successful use of the e-Health intervention are undetermined. Different aspects influence the use of technology; such as utility and usability of the e-Health intervention and age related human factors (cognitive abilities and personal factors).

Objective: This study aims to determine user preferences for an e-Health intervention that aims to improve physical activity in older adults. Different personal factors of the participant will be determined in order to explain variation in the results.

Study design: Qualitative research was conducted according to Grounded Theory approach. A relationship between the themes found in the interviews and the human factors test was explored by determination of the median.

Data collection: Participants were recruited through physical therapists, leading a physical activity group intervention. Data collection will take place at the homes of the participants (≥70 years, participating in sports group) and consists of interviews and tests.

Data analysis: Data analysis was performed according to the Grounded theory approach. The subthemes found were related to the human factors test.

Results: Data was collected on eleven participants. Four themes were found: starting to use e-Health, 'going out', technology and a general theme about the participant. The preference 'technology should be easy to use' is related to a low score on the test for processing speed and reflect a stronger perception of internal control (regarding health).

Discussion: Suggestion for e-Health; an e-Health intervention for older adults should not be committed to one location, is simple to use and can be adapted to the needs and preferences of the participant. During implementation, the learning strategy and the presence of a social network to ask questions should be taken into account.

Conclusion: This qualitative study about user preferences in the older population concerning e-Health interventions provides the following themes that designers could take in account in the development of an e-health intervention that aims to improve physical activity among older adults; starting to use e-Health, 'going out', technology and the participant itself.

Introduction

Physical activity has been proven effective in preventing chronic illnesses in the older population (1). Furthermore, research has shown that long-term physical activity is related to postponed disability and independent living in oldest-old subjects (2). Various interventions that aim to improve physical activity are available, such as sports, exercise groups and physical therapy.

A new way of supporting interventions that aim to improve health is the use of technology or e-Health. The use of e-Health to promote/stimulate physical activity becomes increasingly popular (3). Several definitions for the widely used term e-Health are available. This study uses the definition of Eysenbach(4); e-Health interventions are tools or treatments, typically behaviourally based, that are operationalized and transformed for delivery via internet or mobile platforms. E-Health interventions offer various advantages (5). Messages can be personalized by tailoring, participants can exchange information, and interventions designed as games can be fun (5,6). There are also advantages for the public health care system; it is suggested that e-Health can be a cost-effective add-on for primary health care (7,8).

Despite these promising applications of technology, several reviews state that there is conflicting evidence about the effect of technology in interventions that aim to improve physical activity (3,5,9). Different aspects seem to be related to the use of technology by adults. Firstly, usefulness is a key variable in standard models of technology acceptance (10). Usefulness exists of utility and usability. Utility states whether the functionality of the system in principle can do what is needed and usability describes how well users can use that functionality (11). Secondly, although studies indicate an increasing use of technology among older adults, older adults have more difficulties in learning how to use technology (e.g., computers, internet) and are less likely to use it compared with younger adults (12,13). Aging adults are faced with cognitive impairments. For example, they experience decline in working memory, long-term memory and spatial ability and need more time to orient attention (14). These impairments can influence their ability to perform computer-based tasks. Research has shown that human factors such as cognitive abilities, including memory, speed of processing and spatial ability are important to successful execution of technology-based tasks (12,14).

Research has been conducted to identify predictors for the use of technology among adults. Predictors for the general use of technology are; education, age, ethnicity, fluid and crystallized intelligence, computer anxiety and computer self-efficacy (12). Blanson Henkemans et al.(15) determined personal characteristics for attrition in e-Health services and

concluded that internal locus of control, vocabulary and motivation are positively related to days participating in the study (15).

So, although technology interventions showed to be effective in improving physical activity, it remains unclear which components of technology led to a successful use of the intervention. To our knowledge, a research that explains the conflicting results in e-health intervention studies from the view of the participant has not been conducted yet. Therefore, this study aims to determine user preferences of older adults regarding e-Health interventions taking into account human factors. This leads to the following research question: What preferences do older adults have for e-Health interventions that aim to improve physical activity and how are human factors related to these preferences?

Methods

Design

A generic qualitative research method was used to collect data. Concepts of Grounded Theory (GT) approach were used as this study intends to move beyond description to generate a theory (16,17). Data was collected through in-depth interviews. Secondly, as a large variation was expected in the results due to different levels of human factors among older adults, human factor tests were applied to define subgroups (13). In this way, variation in levels of human factors among the participant, could be taken into account in the analysis of the qualitative data.

The study protocol was approved by the Ethical Committee (TCPE) of the Dutch Organization for Applied Scientific Research (TNO).

Recruitment

The participants for this study were recruited with help from physical therapists, leading physical activity group interventions for older adults. They contacted potential participants to verify if they would be willing to participate. If the participants indicated willingness, an information letter and informed consent form was send to their home addresses. JMKV contacted them within two weeks by phone to verify their willingness. After agreement, an appointment for the data collection was made. Informed consent was signed by all participants.

Participants

Purposive sampling was used as the participants can purposefully inform an understanding of the research problem (17). Patients were eligible to participate if they were at least 70 years old, living independently and participating or have been participating in a groups-sport-intervention led by a physical therapist such as; the functional training exercise program, geriatric fitness or 'Meer Bewegen voor Ouderen' (MBvO), in English: more exercise for older adults.

Participants were excluded if they were exercising independently three or more times a week at a sports club and if their last group training was more than one year ago.

Data collection

Data collection took place at the homes of the participants. After agreement of the participant about study procedures the data collection started. Participants' data were collected in three subsequent steps: 1) recording participants characteristics, 2) human factors tests, and 3) information about user preferences through in-depth interviews. Participant characteristics were collected about; gender, age, education level, living alone or together and date of last training. Human factors tests were performed to assess a participant's level on the following factors: perceived health (18,19), locus of control (20), spatial perception (21), processing speed (22) and concentration (22,23) (Table 1). Based on literature search an interview guide was developed (12–15,24–28). The interview guide contained the following topics: e-health, utility, usability, self-efficacy, computer anxiety and the use of e-health to improve physical activity. The interview guide was peer reviewed by OABH and an experienced qualitative researcher. Two pilot interviews were held to determine suitability of the protocol and to increase internal validity (29,30).

In order to determine saturation, data collection was not a distinct step, but an iterative process with data analysis (17).

Data analysis

Interviews

JMKV transcribed recordings of the interview verbatim. The Qualitative Analysis Guide of Leuven (QUAGOL) was used to guide the preparation of the coding process (31). The result of this preparation phase was a list of concepts.

The first step in the actual coding process is open coding, which is the process of breaking down, examining, comparing, conceptualizing and categorizing data (16,29). The concepts

found in the preparation phase were used as preliminary codes and adapted during this step. To increase inter-rater reliability, every fourth interview was open coded independently by OABH.

The second step of coding is axial coding, which started after the first five interviews. Initial codes were confirmed or invalidated in new interviews, new codes were added and connections between codes and categories were established (29). The themes found were peer-reviewed by OABH. Based on these first results, the interview protocol was adapted. During the third step, selective coding, statements that interrelate categories were generated (17). New themes were also added to come to a complete overview of the results. A member check was performed by phone with one participant to verify the results.

During analysis, constant comparison and analytical induction were applied (29).

Human factors tests

To analyse how different human factors explain variation in user preferences found in the interviews, first subthemes had to be determined as the obtained themes in this research were not specific enough to relate to human factors test outcomes. The subthemes were developed based on the initial codes, themes, interpretation of JMKV in rereading the interviews and peer debriefing. The interviews were scored on presence of those subthemes. Next, for each subtheme was determined whether the participants that scored on that particular subtheme, scored above or below the median on all human factors tests. When the scores within one subtheme and one human factor test were all above or all below the median, a relationship was hypothesized. The median is preferred when data might have extreme values (32). When data was missing, this test was not analysed within that subtheme.

Results

Three physical therapists recruited sixteen potential participants. After reading the information letter and receiving extra information, five participants dropped out for the following reasons; difficulty of the topic (n=3), busy schedule (n=1) and experiencing difficulty in sitting (n=1).

Data collection was performed at 11 participants. As listed in Table 2, the participant pool consisted of four males. The age of the participants ranged between 73 and 85 years with an average age of 78.7 years old. Their education level varied from primary school to higher professional education. Two participants lived together, all other alone. Their last training took place between one week and ten months ago.

The average duration of human factors tests and interviews was 30 and 35 minutes, respectively. One person preferred data collection at the location of the group intervention.

Results from interviews

During the interviews the participants talked about their preferences in technology and in what situation they would be positive about exercising supported by technology.

In general, most participants were not familiar with the concept of e-Health but recognized examples of e-Health. Ten of the included participants used a computer to keep in touch with relatives and friends, to gather information about a certain subject, and to play games.

Four themes were obtained after data analysis: 1) starting to use e-Health, 2) going out, 3) technology, and 4) a general theme about the older user. Regarding starting to use technology; most participants were sceptical regarding e-Health interventions. They mentioned that the start of using technology should be as simple as possible: they should be able to use it after one try-out. Other factors mentioned that make the start of using e-Health more easy are the explanation of the device by an acquaintance and the presence of a social network that supports the older adult in using the e-Health intervention.

Regarding 'going out' older adults mention that in their current situation social interaction is indissoluble connected with physical activity. The group intervention makes them to get out of the house and get in touch with other people. They mention that the social interaction with other people during physical activity is almost as important as exercising itself because it contributes to a reduction of loneliness and an increase of pleasure. Besides that, seeing other people exercise motivates to get physically active yourself, and knowing that you are expected at a certain time to exercise with other members of the group is a motivation for actually going.

'How important is sociability during sports?
That's pretty important. Just a chat and some fun. Then it goes
automatically and you just do it.'

Concerning the theme technology; most of the participants mentioned that the technology should be simple in use and self-explanatory. Preferably they turn it on and it just works. It speaks for itself. Buttons should be large as most participants have difficulties touching the small buttons on their current (cell)phones. The older adults suggest that the e-Health intervention should be:

- motivating and fun;
- fitting health issues and personal characteristics;
- reliable;
- does not change over time;
- offers social interaction with other people;
- enables the participant to choose the desirable time to exercise.

Finally, a general theme concerning user emerged from the data. Firstly, the presence of a health issue is related to the will of older adults to receive treatment (e.g. prescription of physical activity as part of rehabilitation treatment after heart surgery). Furthermore, the same applies to the will to use an e-Health intervention supporting physical activity. Older adults are sceptical as it comes to the use of technology. But they mention that if using technology will help them to reach their goal, they are more likely to use it. Secondly, a positive or negative attitude regarding physical activity and technology is of influence. The participants showed that when they had a positive attitude towards technology, they were more positive about the use of technology to support their physical activity.

'Do you remember your first computer?
I bought it… it's about 25 years ago at Dixons. A little thing. And a printer
and paper with holes. And… eh.. yes, no, I always liked it.'

The subthemes developed within each theme are found in Table 3. These subthemes give a description of factors of influence and concern 'personal contact', 'learning strategy', 'social network', 'social interaction', 'being outside', 'motivational', 'easy to use', 'no change over time' 'fitting the participant', 'being positive or negative about e-Health', 'having a or no want for treatment' and 'no trust in technology'.

Results from human factors tests

Table 4a lists the results of the human factors tests and whether participants scored above or below the median. See Table 1 for interpretation of these scores. Table 4b shows the subthemes mentioned by each participant. All participants mentioning 'technology should be easy to use' scored lower than the median on the test for processing speed and reflect a stronger perception of internal control (regarding health). In this same subtheme, three out of four participants experienced poor health and have less concentration abilities. No indication for a relationship was found between the other subthemes and human factors tests.

Discussion

This study aims to determine user preferences about e-Health intervention that aim to improve physical activity in the older population. This study indicates several factors of influence in the use of an e-Health intervention that aims to improve physical activity in older adults. These factors are divided in different themes and concern the start of using e-Health, 'going out', the technology itself and the older user.

Although, to our knowledge, this is the first research about user preferences in the older population, the result correspond to aspects of previous research. First, although the introduction quoted that older adults are less likely to use computers compared with younger adults, ten of the eleven participants in this study used a computer daily. This corresponds with the research of Amman et al.(33) who showed that, in the comparison of different age-groups using website-delivered computer tailored physical activity intervention, significantly fewer old-aged participants dropped out of the study when compared with the other age groups. Second, the results from the interviews also correspond with aspects of implementation science, for example the e-Health Implementation Tool (e-HIT) (34). Items in this tool such as 'the e-Health initiative is easy to use and fit for purpose' and 'the intervention is entirely credible in terms of security, confidentiality and reliability' correspond with subthemes within this study (see Table 4).

Besides the confirmation, also new, specific themes are found. For example, the wish to have regular contact with the supplier of the device. This could be applied in implementation by involving care givers such as the physical therapist or the (assistant of the) General Practitioner (GP), or by extended contact between the participant and the supplier.

The presence of a health issue seems to be of value for older adults in the consideration of using an e-Health intervention. When older adults are in good health, but prevention strategies are advisable, the absence of a treatment demand should be considered. In accordance with the Social Cognitive Theory (SCT) we suggest that, possibly even more in interventions that focus on prevention, personal goals should be set (35,36). In goal setting, it is important people reflect their motivation and possibilities. Furthermore, they should monitor their behaviour and consequences. This will help people to compare their behaviour with the goals they had set (28). Complementary, most older adults mentioned that, besides their goals set, they want to notice improvement in their activities of daily life (ADL). Therefore, the content and the evaluation (or monitoring) of the e-Health intervention should also focus on improvement of ADL.

Suggestion for e-Health

Table 4 offers an overview of factors of influence in the use of an e-Health intervention that aims to improve physical activity in the older population. We suggest this overview can be used in the development and implementation of an e-Health intervention.

We would like to make the following suggestion for the development and implementation of an e-Health intervention: for the device a tablet is preferred as it can easily be relocated to, for instance, the garden. Being physical active (supported by a device) should not be committed to one location.

The content of the e-Health intervention should be variable so it can be easily adapted to the personal needs and wishes of a participant. For example, the change of priority in health issues, the opportunity to choose the desirable time to exercise, setting personal goals and monitoring progress. Preferences regarding motivational cues and instructions (e.g. visual or auditory) can also be set.

In implementation, attention should be paid to the different ways of learning to use technology such as using a manual, trial-and-error and repeated instructions. There should be a network in participants' close circle where they can ask their questions. Preferably, the participant can also exercise with others within this network. Older adults suggest that there should be personal contact with the supplier of the e-Health intervention. This person is preferably an acquaintance of the participant and is aware of the medical issues he or she is dealing with. This person should be patient in explaining the use of the technology without being patronizing. Therefore, we suggest the social network can be led by a physical therapist who is trained in editing the e-Health intervention, if necessary.

Strengths and limitations

Despite the convincing effect of supporting literature, weaknesses of this study should be considered. First, due to a small sample it was not possible to reach saturation within each theme. Consequently, the result of this study is a description of themes that should be taken into account when designing and implementing an e-Health intervention rather than a theoretical framework for designers. Also, with a larger sample it might be possible to find a relation between different human factors in this population using statistical analysis. Other limitations related to the human factors test are the ceiling effect found in the Visual Object and Space Perception battery (VOSP) blocks, inexperience of JMKV in recording tests and the absence of norm values which makes it impossible to generalize the results found to a larger population. Therefore, the results of relating the human factors tests to subthemes are

hypotheses for future research rather than conclusions, and therefore should be interpreted with caution. At last, the result of the member check was difficult to interpret. One participant was asked to react on the themes found. She responded with ‘yes’ or ‘no’ on subthemes and found it hard to explain why certain subthemes were not applicable for her personal situation. For future research, member checks should be performed at home and with more participants. Regarding the strengths of this study, attention to the trustworthiness has been paid. The use of an interview protocol and the QUAGOL standardized the data collection and preparation process and, therefore, increased the reliability of the study. Two pilot interviews has been held to determine suitability of the protocol and to increase internal validity (30). OABH peer-reviewed the preliminary results, the conceptual interview schemes and coded every fourth interview independently to assure inter-rater-reliability. Memoing and reflection on the role of the researcher was applied during the whole study. These written reports helped formulating a theory and provided insight in the data analysis (17). JMKV applied bracketing to assure that her own experience would not affect the outcome of this study.

Future research

This study gives a suggestion of themes that might be of influence in the use of technology by older adults and takes human factors into account. As a part of the collected data is quantitative (human factors tests), it would be interesting to transform the qualitative data to quantitative data. Ahmed et al. (37) used a semi-qualitative participatory method known as Concept Mapping (CM) to identify factors that must be addressed in order to implement an computer-assisted tool (38). In this study, with use of CM a statistical analysis can be performed to determine a relationship between human factors and user preferences. Therefore, future research should focus on the development of a questionnaire that collects user preferences. Together with testing human factors, the existence of a relationship between human factors and user preferences can be determined. This will be helpful in designing user-centred e-Health interventions for older adults. A large qualitative study is necessary to survey all possible determinants with respect to personal factors and preferences concerning utility and usability.

Conclusion

This qualitative pilot study about user preferences in the older population concerning e-Health interventions provides the following themes that designers could take into account when developing an e-health intervention that aims to improve physical activity among older adults:

starting to use e-Health, ‘going out’, the technology itself and, about the older user. More research is needed to get a complete overview of factors that influence user preferences, to determine the relationship between human factors and preferences and to develop a theoretical framework which is usable for designers.

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Table 1: human factor tests

Human factor	Test	Score
Perceived health	Dutch Version of Nottingham Health Profile (NHP) (18,19)	High score indicates poor perceived health (0-100)
Locus of control in three domains; internal, doctor, chance.	Multidimensional Health Locus of Control Scale (MHLOC) (20)	Higher subscale indices reflect stronger perception of control in the given dimension (6-36)
Spatial localisation	Visual Object and Space Perception (VOSP) – position (21)	high score indicates stronger spatial localisation (0-10)
Spatial ability (observing spatial relations)	Visual Object and Space Perception (VOSP) – blocks (21)	high score indicates stronger spatial ability (0-10)
Processing speed	Digit Symbol Substitution Test (DSST, Wais-i) (22)	high score indicates stronger speed of processing (0-115)
Concentration, attention, working memory	Digit Span; forward and reverse (22,23)	higher score indicates better concentration (1-21)

Table 2: participant characteristics

Participant	Male/female*	Age (years)	Education level*	Lives*	Last training (weeks)
1	F	75	PE	T	40
2	F	83	PC	A	32
3	M	75	CHP	T	32
4	M	78	CIV	A	1
5	M	81	CHP	A	1
6	F	85	JSE	A	1
7	F	76	PE	A	1
8	F	80	JSE	A	1
9	F	76	JSE	A	1
10	M	73	JSE	A	1
11	F	84	JSE	A	1

* F: female - M: male - PI: primary school, incomplete – PC: primary school, complete – PE: primary school extended – JSE: diploma of junior secondary education – CIV: certificate of intermediate vocational education – CHP: certificate of higher professional education – A: lives alone – T: lives together.

Table 3: Meaning of (sub)themes

Starting to use e-Health	
1	There is personal contact on a regular base with the installer of the technology. This is important as this increases trust of the participant in the installer. According to older adults, this trust contributes to the regular use of the e-Health intervention. This installer can be the actual supplier of the device, but can also be a care giver such as a physical therapist.
2	The learning strategy of the participant should be taken in account. The participants mentioned different ways of learning how to use a device.
3	The presence of a social network that supports the older adults in the use of a device. The interpretation of this social network is diverse; it can consist of family members, friends or acquaintances at a course.
Going out	
4	Social interaction during exercising is important for older adults. This means that social interaction is indissoluble connected with physical activity. Therefore, the technology should offer a way of exercising including social participation. For example; the technology connects two older adults with the same walking speed that wishes to walk outside or, the technology offers a group intervention.
5	The participants like to go outside for shopping, just a walk, to visit other people and to exercise. The technology should therefore be applicable in multiple contexts.
Technology	
6	The technology motivates the participant to perform exercises. Possibilities for this motivational cue in the device are; reminders, tailored feedback on progress, connects with older adults and an enthusiastic virtual instructor.
7	The technology is easy to use. This means that it works by itself.
8	The technology does not change over time. This means that no changes should be made in the way of using the technology.
9	The technology fits the physical and cognitive ability of the participant. The technology should be consistent with the user concerning physical problems (for example; small buttons, poor visibility) and cognitive problems (for example; lack of concentration).
The older user	
10	The older user is positive about the use of an e-Health intervention that aims to improve physical activity.
11	The older user is negative about the use of an e-Health intervention that aims to improve physical activity.
12	The older user has no trust in technology. This means that the participant finds technology unreliable.
13	The older user has a want for treatment, concerning physical activity.
14	The older user has no want for treatment, concerning physical activity.

Table 4a: participants' scores on human factor tests

Participant → / Human factor test* ↓	1	2	3	4	5	6	7	8	9	10	11
NHP	**24.2**	**52.31**	**43.27**	*15.52*	*23.5*	*24.1*	-	**67.59**	**39.93**	*2.1*	*5.8*
MHLOC-internal	**26**	**22**	**23**	**22**	*21*	-	-	**22**	*12*	*18*	*20*
MHLOC-doctor	*11*	**23**	19	*17*	19	**22**	**25**	19	*12*	**22**	**20**
MHLOC-chance	**16**	20	**22**	*17*	*16*	**21**	-	20	*12*	**29**	*18*
VOSP-position	**10**	9	*6*	*8*	9	**10**	*7*	9	**10**	**10**	**10**
VOSP-blocks	10	*6*	*8*	*9*	10	10	*9*	10	10	*9*	10
DSST	*33*	*20*	**44**	**38**	**40**	**38**	-	*15*	*21*	*37*	**49**
Digit forward	*11*	*10*	**14**	**13**	**13**	*6*	-	**13**	*11*	*9*	**14**
Digit reverse	5	6	8	7	6	6	-	10	9	6	10

Table 4b: participants' scores on subthemes

Participant → / Theme ↓	1	2	3	4	5	6	7	8	9	10	11
Starting to use e-Health											
1: personal contact with supplier					X		X			X	
2: learning strategy	X	X	X	X	X	X			X		X
3: social network	X	X	X		X			X	X	X	X
'Going out'											
4: social interaction		X		X	X			X	X		X
5: being outside				X		X					
Technology											
6: motivational			X	X	X		X		X	X	
7: easy to use	X	X						X			X
8: does not change											X
9: fits the participant		X		X		X		X	X		X
The older user											
10: positive about e-health		X	X			X		X	X	X	
11: negative about e-Health	X										
12: no trust in technology						X					
13: a want for treatment	X	X	X	X		X	X	X	X	X	X
14: no want for treatment					X						

* NHP: Nottingham Health Profile – MHLOC: Multidimensional Health Locus of Control Scale – VOSP: Visual Object and Space Perception Battery – DSST: Digit Symbol Substitution Test

Legend:

Score above median

Score below median

Score equal to median

Missing value: -

Subtheme is found in interview: X