Why My Grandfather Finds Difficulty in using Ehealth: Differences in Usability Evaluations between Older Age Groups

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Abstract: Many studies emphasize the need for more in-depth analysis of how age-related barriers influence the user acceptance of eHealth. In this study, we elaborate on existing work in this field by identifying how age differences affect usability evaluations in eHealth. We examined how older adults between 55-64 years (*n=10)* evaluated the usability of a game-based eHealth application in comparison to adults of 65 years and older (*n=19).* A concurrent think aloud protocol and the System Usability Scale (SUS) were administered to 29 participants. Usability issues were elicited from the think aloud transcripts and benchmark scores were obtained from the SUS. We conducted both: (1) a statistical analysis on the amount of usability issues and SUS score; and (2) a thematic analysis of the usability issues. Our study found that the 55-64 age group encountered significantly fewer usability issues compared to the 65+ age group. Furthermore, the thematic analysis revealed that while both groups had similar problems regarding the 'Navigation & Structure' category of the game-based eHealth application, there was much variation in the other usability categories of 'Content & Information', 'Design & Presentation' and 'Other'. Our results can improve the development of eHealth that support healthy ageing.

1 INTRODUCTION

Many new eHealth systems focus on supporting healthy ageing. A major health risk facing older adults is frailty: The decline in cognitive and physical functions that can lead to recurrent falls, hospital visits and even death (Fried et al., 2001). Multiple studies have found that the symptoms of frailty can be slowed down by staying physically active (Liu and Fielding, 2011; Theou et al., 2011) and engaging in cognitive training (Ng et al., 2015). The group of older adults continues to rise – since 1990 there has been an increase of 62% of people aged 65 years or older (CBS, 2018) – and consequently the risks of frailty increases. This can impose a heavy load on health care systems. EHealth can support and relieve health care systems by motiving older adults to stay active by providing online physical or cognitive training. Furthermore, whereas a health professional can only treat a limited number of patients, eHealth can be implemented to reach for larger groups of older adults.

However, a recurring problem in eHealth is the successful implementation of eHealth in the daily lives and routines of people and health care processes. eHealth systems should be tailored to the specific environments and skills of the intended end-user groups to maximize the probability of successful implementation (Broens et al., 2007). One important pre-requisite for the acceptance and eventual implementation of eHealth is good usability (Broens et al., 2007; Narasimha et al., 2017). To measure usability of systems and to identify usability problems, it is important to conduct usability evaluation tests involving potential end-users. In many studies, eHealth systems are evaluated on their usability among the target end-user group. However, for systems to be truly effective, they must be user-friendly for various groups of people and be able to compensate for variability in, for example, socio-economic status, health literacy, technology literacy and chronic care needs (Kreps and Neuhauser, 2010; Lyles and Sarkar, 2015).

Several factors affect any usability evaluation. First, adults of 65 years or older have fewer computer skills than younger generations (Chen and Persson, 2002; Gatto and Tak, 2008). However, eHealth systems that take into account lower computer

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literacy could be perceived as cumbersome or even unusable by the younger generation who are more experienced with computers, tablets, and smartphones. Second, with higher age the risk of multimorbidity, defined as the prevalence of two or more chronic conditions, increases (Salive, 2013). Living with a chronic illness can induce higher levels of stress (McEwen, 2008), that can affect how easily users can perform tasks within a system or the types of health information they need. Third, the study of Wildenbos et al. (2018) identified cognitive (e.g. working memory, spatial cognition), physical (e.g. flexibility of joints, speed of performance), perception (e.g. visual accommodation, colour vision), and motivational (e.g. trust in own abilities, efficiency in benefits) barriers that older adults often experience when using a system. The first three are the result of high age and can affect user interaction. For example, people who have limited fine motor skills could find difficulty in clicking on small elements in a graphical user interface (GUI). Also, motivational barriers can be different for the older and younger generations (Wildenbos et al., 2018). The study of Morey et al. (2017) describes how younger participants saw more benefits in an app intended for heart failure patients than older adults. This can affect how users perceive the effectiveness and usefulness of a system. Last, although older adults often perceive how technology could benefit them in healthy ageing, the technology should not be unacceptably intrusive in either their homes and lives (Jacelon and Hanson, 2013; Peek et al., 2016). Younger generations are far more familiar with technology and are likely to have a more positive view on how technology can be integrated in their daily routines.

In this study, we aimed to discover if and how usability evaluations differ between age cohorts. We conducted a usability evaluation of an eHealth system, a game-based eHealth application called 'Stranded', between two groups: (1) adults of 55-64 years, and (2) adults of 65 years or older. The goal was to examine if there are differences in the usability perceptions between the two age groups in the types and severity of usability issues.

2 METHODS AND MATERIALS

2.1 Case

In eHealth interventions, the challenge is to establish and maintain engagement of the user for long-term use of the technology, which is needed to establish the targeted health goals of the older adult. 'Stranded' is a game-based eHealth application that aims to engage the older adult on the long term by using gaming technologies. To the user, this game-based application can be seen as an alternative interface for the original eHealth application (called tele-rehabilitation). The intended target group for the application is aged 65-75 years, with sufficient computer literacy to independently use a mobile device or pc and with an interest in digital games. In the design process, game design and the selection of game elements were fitted to the specific preferences and characteristics of the intended target group. This resulted in a set of game design guidelines (as described in de Vette et al., submitted) for older adults, with the following characteristics: moderate—to-high novelty (e.g. story line, enabling exploration), moderate-to-high dedication (e.g. enabling achievement, learning and mastery), low Discord and Threat (e.g. relaxed atmosphere, not triggering negative emotions) and low Social (i.e. solo player).

Figure 1: Screenshot of the Stranded home screen. By clicking on one of the cabins, the user goes to the tele-rehabilitation portal.

When Stranded is started for the first time, an opening animation introduces the backstory. Every session starts with the choice for the original or game-based eHealth application. In the game, the main character – a female explorer – is stranded on a deserted island after her ship was caught in a storm. From the beach, the player can explore the island and access huts. These huts are connected to the training modules and linked to the original tele-rehabilitation. In addition, the player can go to a virtual crop field, visit the rest of the island and play mini-games there, or find out about a wooden quay where a boat it built. Items wash up on the beach in bottles, which contents are adapted based on the outcomes in the training module. For example, the bottles can contain items that can be stored in a trophy hut or seeds that can be planted in the crop field. The locations on the island map show

levels that can be played, which can be opened by completing a training schedule in the huts. In these locations, several mini-games can be played. After finishing a level, the player receives a part of a boat. After finishing all levels (corresponding to the finishing of the 12 week rehabilitation programme), your boat is built and you can leave the island.

2.2 Participants

Participants were eligible for participation in this study if they fitted within one of the two age groups and if they had basic computer skills, such as sending an e-mail. We recruited participants through a Dutch panel for adults aged between 55 and 64 and we collaborated with local geriatric physiotherapy practices to recruit participants aged 65 or older.

2.3 Study Procedure

Before participation, all respondents completed and signed an informed consent form. First, participants were asked about their demographics after which they were given five tasks to complete within the game-based eHealth application. The participant had five minutes to fulfil each task. During these tasks, they had to verbalize their thoughts. After completing these tasks, they filled out the System Usability Scale (SUS) (Brooke, 1996).

2.4 Data Analysis

Audio recordings and screen-capture recordings were made during the usability evaluation sessions and transcribed. Usability issues were identified from the

Table 1: Overview of the critical issues and corresponding usability category.

ID	Age groups	Usability issues	N&S	C&I	D&P	Other
1.1	55-64 / 65+	The user does not know the purpose of the cabins in the home-screen.		X		
1.2	55-64 / 65+	The user cannot find the entrance to the kitchen.			X	
1.3	55-64 / 65+	The user has difficulty distinguishing clickable and non-clickable elements in the interface.			X	
1.4	55-64 / 65+	The user cannot find the ingredient list in the kitchen			X	
1.5	55-64 / 65+	The user does not understand that in the island overview interface, each circle represents a mini game.			X	
1.6	55-64 / 65+	The user cannot find the direction sign to the island overview in the home-screen			X	
1.7	55-64 / 65+	The system does not offer the user any support for entering special characters while logging in				X
1.8	55-64 / 65+	The user believes the introduction of a physical exercise is the actual explanation of the exercise.			X	
1.9	55-64 / 65+	The interface does not show where the physical exercises can be found (e.g. through the physical exercise cabin)	X			
2.1	65+	The user wants to leave the game because he or she cannot find the elements he or she is looking for (e.g. exercise, e-mail, mini game)	X			
2.2	65+	The user has difficulty understanding the connection between the various gaming elements				X
2.3	65+	The system does not provide an option to erase incorrect text from the entry boxes in the login screen without using the keyboard				X
2.4	65+	The user does not understand the connection between the gaming interface and the tele-rehabilitation portal				X
2.5	65+	The user does not understand the purpose of the play button in the exercise video. He or she believes this button is used to go to the next exercise.			X	

transcripts and classified as a minor, serious, or critical, following the procedure by Van Velsen et al. (2011). The following definitions of Duh et al. (2006) were used for the severity classification:

- Minor issue: Occurred infrequently among the participants and/or the problem only increased task completion time slightly;
- Serious issue: Occurred frequently among the participants and/or the problem severely increased task completion time;
- Critical issue: Occurred when all participants had the same problem and/or the problem prevented participants from completing tasks.

The identification of the usability issues and determination of the severity of each issue, was first performed by one coder (MB). A second coder (LvV) independently analysed a subset of the data. Discrepancies between de codebooks were discussed and overcome, after which the first coder (MB) again coded the whole codebook, and finally the second coder (LvV) reviewed the codebook.

Next, based on the framework proposed Van der Geest (2004), each usability issue was grouped into one of the following four categories: (1) Navigation & Structure; (2) Content & Information; (3) Design & Presentation; and (4) Other. This categorization was performed by a pair of two researchers (MB & StS). A third researcher (LvV) checked the final categorization. After discussions between the researchers about disparities, final alterations to the categorization of the usability issues were made. Table 1 shows a subset of the codebook, the critical issues per age group with corresponding usability category.

2.5 Statistical Analysis

Tests for normality indicated that normal distributions could not be assumed. Therefore, the data was analysed by applying non-parametric methods. Mann-Whitney U tests were calculated to measure: (1) if there was a significant difference between the average SUS scores of the two age groups; (2) if there were significant differences between the number of minor, serious, and critical issues between the two age groups; and (3) if there were significant differences between unique minor, serious, and critical issues between the two age groups.

3 RESULTS

3.1 Demographics

In total, 29 older adults participated. Table 2 gives a complete overview of the demographics of both age groups. Ten respondents aged 55-64 participated in the study. Six of them (60%) were male, and four (40%) were female. The average age was 59 years. Their educational background included lower vocational education (20%), vocational education (40%), and higher vocational education (40%).

A total of 22 older adults of 65+ years agreed to participate, of which 19 completed the study. Twelve of them were male (63.2%) and seven were female (36.8%). Their mean age was 74 years and their level of education consisted of elementary education (5.3%), lower vocational education (42.1%), vocational education (26.3%), and higher vocational education (21.1 %). However, one participant did not mention her educational background.

3.2 SUS Scores

With an average SUS score of 42.0, the usability of Stranded was found to be just below the acceptability threshold of the SUS scoring scale for 55-64 age group. The participants of the 65+ age group gave the game-based eHealth application ‘Stranded’ a SUS score of 26.7, which means that the usability of Stranded is unacceptably poor.

3.3 Usability Issues

There were in total 398 usability issues found across all participants: 111 usability issues in the 55-64 age group and 287 usability issues in the 65+ age group. We deduplicated usability issues across participants per age group, which resulted in 105 unique usability issues. Finally, we examined which usability issues were being present for both age groups and again removed duplicates. This resulted in 26 unique usability issues that were found among participants in both age groups; 44 issues that were only found in the 65+ age group, and nine issues that were only found in the 55-64 age group. Table 3 shows the number of minor, serious, and critical usability issues for each age group.

The 55-64 age group yielded a total of 12 (34.2%) minor, 14 (40%) serious, and 9 (25.7%) critical unique usability issues. Examples of minor issues are ‘Not sure how to use the button game modus’, and ‘Restart-button is mistaken for a start-button’.

Examples of serious issues are 'Physical exercises do not provide information about the length of each exercise', and 'Difference between gaming elements and computer icons (e.g. game buttons and windows-icons) is unclear'. Examples of critical issues are 'Direction signs to the crop field cannot be found in the home page of the game-based eHealth application', and 'The purpose of the cabins in the home-screen is unclear for the user'.

The think aloud protocol elicited 32 (45.7%) minor, 24 (34.3%) serious, and 14 (20%) critical usability issues for the 65+ age group. Minor issues included 'Avatar looks like a male rather than a female character', and 'Dislikes the music'. Serious issues were problems such as 'The help-page provides insufficient information to support the playing of the game', and 'The application does not explain how to build the boat' (e.g. through performing the physical exercises). Issues such as 'Connection between the tele-rehabilitation portal and the gaming interface is unclear', and 'The gaming interface provides insufficient information for the user about where the physical exercises can be found', were classified as critical issues.

Table 2: Demographics (age, education, technology usage) of the 55-64 age group and the 65+ age group.

Age group	ID	Sex	Age	Education	Technology usage
55-64	01	M	60	Vocational	PC/Laptop, Smartphone, Tablet
	02	M	55	Higher vocational	PC/Laptop, Smartphone
	03	M	63	Vocational	PC/Laptop, Smartphone, Tablet
	04	M	57	Vocational	PC/Laptop, Smartphone, Tablet
	05	F	58	Higher vocational	PC/Laptop, Smartphone, Tablet
	06	F	63	Higher vocational	PC/Laptop, Smartphone, Tablet
	07	M	59	Lower vocational	PC/Laptop, Smartphone, Tablet
	08	F	57	Lower vocational	PC/Laptop, Smartphone
	09	M	56	Higher vocational	PC/Laptop, Smartphone
	10	F	59	Vocational	PC/Laptop, Smartphone
65+	11	F	68	Lower vocational	PC/Laptop, Smartphone, Tablet
	12	M	79	Vocational	PC/Laptop
	13	M	78	Higher vocational	PC/Laptop, Smartphone, Tablet
	14	M	67	Lower vocational	Smartphone
	15	M	87	Lower vocational	PC/Laptop, Smartphone
	16	M	65	Vocational	PC/Laptop, Smartphone
	17	M	72	Higher vocational	PC/Laptop, Smartphone, Tablet
	18	M	69	Vocational	PC/Laptop, Smartphone
	19	M	80	Higher vocational	PC/Laptop
	20	M	77	Lower vocational	PC/Laptop, Smartphone, Tablet
	21	M	69	Elementary education	PC/Laptop, Smartphone, Tablet
	22	F	74	Higher vocational	PC/Laptop, Smartphone
	23	M	74	Lower vocational	Smartphone, Tablet
	24	F	82	Lower vocational	PC/Laptop, Smartphone
	25	F	72	n.a.	PC/Laptop
	26	F	77	Lower vocational	Smartphone, Tablet
	27	F	77	Vocational	PC/Laptop, Smartphone, Tablet
	28	M	65	Vocational	PC/Laptop, Smartphone
	29	F	79	Lower vocational	PC/Laptop, Tablet

3.4 Statistical Differences between Age Groups

Mann-Whitney U-test scores were computed between the mean scores of the SUS and the numbers of minor, serious, and critical usability issues. When considering the SUS scores between the two age groups, the 65+ age group (Mdn = 27.5, IQR = 10-42.5), significantly differed from the 55-64 age group (Mdn = 38.8, IQR = 30.6-48.8), U = 52, p = .05. Also, the number of serious issues in the 65+ age group (Mdn = 8, IQR = 6-9), significantly differed from that in the 55-64 age group (Mdn = 4.5, IQR = 3-6.3), U = 33, p = .004. Finally, the number of critical issues in the 65+ age group (Mdn = 4, IQR = 3-5) showed a significant difference with that in the 55-64 age group (Mdn = 1, IQR = 0-3), U = 14, p = .001. The difference in the number of minor issues was not significant between the 55-64 age group (Mdn = 5, IQR = 2-7.5) and the 65+ age group (Mdn = 3, IQR = 2-5), U = 118.5, p = .28. Figure 2 illustrates the differences of the medians between age groups for the usability issues using box plots.

3.5 Thematic Analysis of Usability Issues

The usability issues were grouped into one of the following four categories: (1) Navigation & Structure; (2) Content & Information; (3) Design & Presentation; and (4) Other. The first category included 11 usability issues, of which six issues were present for both age groups. The second category contained 19 usability issues, of which six issues were present for both age groups. In the third category, there were 29 usability issues, of which ten issues were present for both age groups. The final category included 20 usability issues, of which four were present for both age groups. Figure 3 shows the number of minor, serious and critical usability issues per category for each age group.

Table 3: Usability issues (minor, serious, critical) per age group.

	55-64	65+	Both
Minor	7	27	4
Serious	2	12	13
Critical	-	5	9
Total	9	44	26

3.5.1 Navigation & Structure

Participants in both age groups had difficulty controlling game elements, such as moving the avatar in the GUI and objects in the mini games. Also, navigation to different locations (the tele-rehabilitation portal and the mini games) caused problems because the system gives little information to users about where various elements can be found. When a user by accident found the mini games by chance, he or she had difficulty rediscovering those locations in a subsequent task. Most participants preferred the use of the browser navigation elements to the navigation elements in the GUI. The main difference between the age groups was that participants in the 65+ age group sometimes decided to quit the game because they thought they had to go somewhere else to locate the physical exercises, whereas the younger age group continued their search in the GUI.

3.5.2 Content & Information

The information available in the game-based eHealth application did not provide sufficient information for users to feel in control of the game. For both age groups, participants puzzled over the use and purpose of various GUI elements, namely: (1) the cabins in the home-screen, which are the link to the tele-rehabilitation portal; (2) the buttons ‘game modus’ (to switch off the gamified interface) and ‘basic modus’ (for people with color sensitivity or contrast difficulties); (3) the functionalities in the mail inbox; (4) the login entry fields, and (5) the use of the vegetable garden. Furthermore, in both age groups there was ambiguity about the overall goal, namely to build a boat to escape the island. In the 65+ group, participants mentioned that they did not understand how they can build a boat, and in the 55-64 age group they did not understand the purpose of the docks (in which the boat will be shown). The difference is that this was a minor issue for the 55-64 age group, but a serious issue for the 65+ group.

The participants in the age group 55-64 required additional information on various elements of the game-based eHealth application and the connecting tele-rehabilitation portal. For example, when following the physical exercises, they needed more explanation on the length and frequency of these exercises. The participants in the 65+ age group experienced more difficulty understanding the available information. The information provided in the help video on how to use the mail inbox runs too quickly, and participants did not understand the information provided in the GUI.

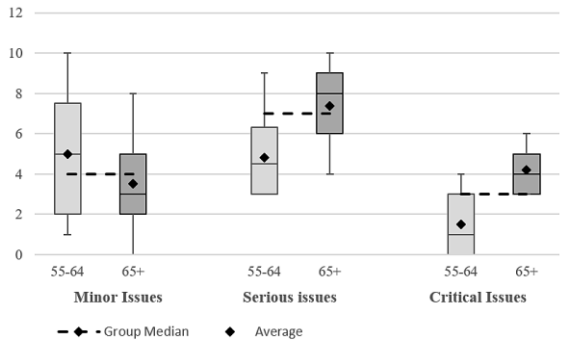

Figure 2: Box plots of the number of minor, serious and critical issues per age group.

3.5.3 Design & Presentation

Similar usability issues regarding the aesthetics and design for both age groups were mostly critical and serious issues. Participants had problems discovering the direction signs in the home screen of the GUI, which prevented or slowed down task completions. Furthermore, the design of buttons in the GUI led to confusion. For example, every time a user went back to the home screen the information button lighted up. This led users to believe that there was new or additional information available for them to read, which was not necessarily the case. Also, every participant sometimes had trouble discriminating between clickable and non-clickable GUI elements.

Looking at the unique issues for each age group, there were many additional usability issues in the 65+ age group, while just two minor issues were unique for the 55-64 age group. In the 65+ group, there were several issues regarding the aesthetics. Participants did not like the music and the objects in the GUI were displayed in too small a size for them to identify. Also, participants ran into problems because of the layout of GUI elements. Since some elements are placed closely together, users often clicked on the wrong element without noticing. Moreover, one respondent who was color blind could not understand the color codes in the tele-rehabilitation portal. Finally, some participants reported usability issues regarding the design but these problems were are actually due to their unfamiliarity with standard design principles of computer interfaces.

3.5.4 Other

In both age groups difficulties were reported regarding the accessibility of the system. Users had trouble creating special characters to log on and the game-based eHealth application is not adaptive for people living with dyslexia or other reading problems. There were just two minor usability issues that were only present in the 55-64 age group. One of these is that participants had no problems locating the direction sign to the garden, but difficulty pressing this sign because the clicking area only partly

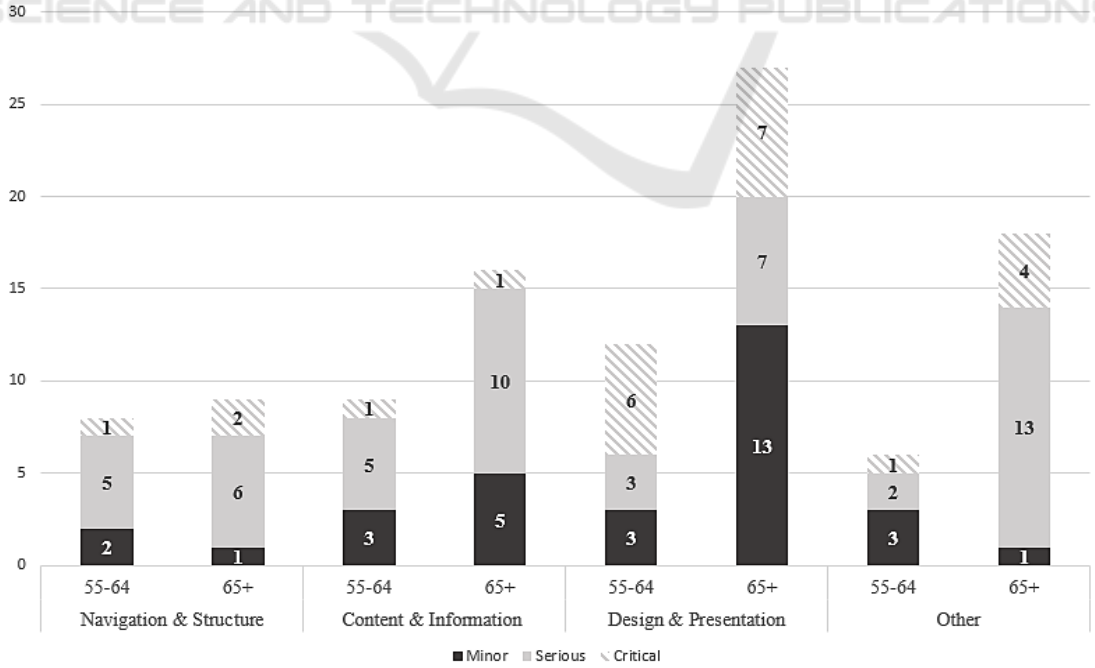

Figure 3: Minor, serious and critical usability issues per usability category for both age groups (55-64 and 65+).

technical aspects, such as the page load time. For example, when participants clicked on a direction sign, the loading of the next interface screen holds of loading the next page until the avatar has walked to the direction sign. Issues that were considered critical were issues where participants had difficulty grasping the game story and the overall goal of the game-based eHealth application. The connection between the game-based eHealth application and the tele-rehabilitation portal often remained unclear and participants did not understand the game story. These were critical issues that prevented users from completing the given tasks.

4 DISCUSSION

This study examined how age-related barriers affect the usability evaluations of an eHealth system. There were four main results. First, participants of the 55-64 age group rated the overall system usability significantly higher than participants of the 65+ age group. Second, participants of the 55-64 age group had significantly fewer usability issues than participants for the 65+ age group. Third, the identified usability issues reported by the 55-64 age group were less severe than in the 65+ age group. Last, there are differences in the types of usability issues found by the two age groups, except for navigation within the game-based eHealth application. Navigation & Structure issues were quite similar for both groups. In contrast, Design & Presentation and Content & Information, and Other issues had more variation in severity and content between the two age groups.

The statistical differences between the age groups can be explained via the groups' digital skills. Van Deursen et al. (2009) found that a higher age especially affects operational and formal internet skills, such as operating an internet browser and maintaining sense of orientation. In this study, we found similar results. Although in both groups participants had orientation problems in the system, we found differences regarding operational skills between the age groups. The participants in the 65+ age group had difficulty with understanding technical features and functionalities of the game-based eHealth application. These issues were not present for the 55-64 age group. Also, the 65+ age group had more serious issues related to understanding the content and the purposes of GUI elements, like buttons, than did the older adults aged 55-64, in the game-based eHealth application. In addition, for the 65+ age group, these issues were often more severe, serious or critical, than for the 55-64 age group.

However, these statistical differences do not yet explain the low SUS scores for both age groups. Typically, a SUS score does not drop below the threshold of 50 (Bangor, Kortum and Miller, 2008). For older adults to use technology, it is important that they perceive some benefits and relevance in using the technology (Melenhorst and Bouwhuis, 2004). However, from the usability test, it became clear that many participants had difficulty grasping the purpose of the cabins in the home–screen (i.e. to access the tele-rehabilitation portal). Also, they did not understand the connection between the gamified interface and the portal. It could be that the gamified interface slightly blurs the underlying goal of improving one's physical condition and making progress in the game by performing physical exercises.

The thematic analysis also revealed differences between the age groups, in the type of usability categories. These differences can be explained because the categories refer to various factors of how a user interacts with a system. Navigation & Structure issues result from goal-driven strategies. A user must understand and predict consequences by clicking on a GUI element (Kitajima, Blackmon and Polson, 2000). This requires the system to have an intuitive and logical structure. In contrast, the categories of Content & Information and Design & Presentation refer to functionalities of the system that support a user in his or her quest. Users may need varying levels of detailed information and support. For eHealth, information needs to be tailored to users' levels of health literacy (Chew, Bradley and Boyko, 2004), motivation to adopt a healthy lifestyle (Harjumaa and Oinas-Kukkonen, 2009) and both physical and cognitive functioning (Flores et al., 2008; Gerling et al., 2012; Hoogendam et al., 2014). In the category 'Other' there were several issues related to the accessibility of the system. The study of Huber and Vitouch (2008) found that the accessibility of the system can significantly affect the usability ratings.

The current usability evaluation methods do not take these additional factors into account to compensate for its potential effect on the perceived usability. Usability experts and researchers working in the field of healthy ageing could use these results to optimize and standardize usability evaluations and benchmarks of eHealth systems. As we found in the thematic analysis, within each category there is a large variance in the type of usability issues. For example, in the Design & Presentation category the issues varied from disliking music to problems with

graphics resulting from color blindness. Also, the Other category is as an undefined category comprising a group of leftover usability issues, such as technical and accessibility issues, that could not be placed in the other three categories. We need more information on factors that affect usability in the eHealth domain and which aspects of the system affect the user-friendliness of eHealth.

4.1 Study Limitations

This study applied fixed age boundaries in the evaluation of usability. Of course, in real-life there will be less distinctive age boundaries for users of eHealth systems. Also, in the literature, there is a growing body of research on how age, especially older age, affects usability, user acceptance and perceived intention-to-use of eHealth systems in daily life. However, in our study we wanted to know in more detail which aspects of a system's usability are affected by age-related barriers. We did this by examining differences in the types and severity scores of usability issues. Finally, this study used a qualitative approach to examine how age differences affected usability. To generalize the results to the elderly population, we need to conduct larger studies on representative cross sections of the ageing population.

5 CONCLUSIONS

Current usability evaluations in eHealth do not take into account variations in end-user populations and their effects on the perceived usability of a system. This study found that the perceptions of usability differ between two consecutive age groups. Not only were there differences in the type of usability issues between the age groups, but also statistically significant differences were found in the number of serious and critical usability issues that each age group encountered. This study has established that variations in end-user populations affect usability evaluations in eHealth. The next step is to examine which factors we need to take into account to measure effectively the user-friendliness of eHealth applications.

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