Technology users’ experiences of remote rehabilitation as part of counseling planning: a qualitative study

Abstract

Background: Even though technology is becoming increasingly common in rehabilitation programs, insufficient data is available of rehabilitees’ perceptions and experiences as yet. Therefore, it is important to understand their abilities to use technology for remote rehabilitation.

Objective: This is a qualitative study on technology experiences of persons affected by cardiovascular disease assessed before remote rehabilitation. The aim of the study was to explore rehabilitees’ experience with technology before 12 months remote rehabilitation.

Methods: Qualitative interviews were conducted with 39 rehabilitees in four focus groups. The participants were aged 34–77 years (average 54.8 years) and male 74%, had coronary artery disease (CAD), and were undergoing treatment in a rehabilitation center. The interviews were conducted between September 2015 and November 2016. Data was analyzed using Glaser’s mode of the grounded theory approach.

Results: The result of the study is an “identifying the e-usage” category, which relates to rehabilitees identifying their usage of information and communication technologies (ICT) (e-usage) in the process of behavior change. The category formed into four subcategories which define the rehabilitees’ technology experience. These categories are: feeling outsider, being uninterested, reflecting benefit, and enthusiastic using. All rehabilitees expected remote technology should to be simple, flexible, and easy to use and learn. The results reflecting their technology experience can be utilize in e-rehabilitation programs. Rehabilitees who feel outsiders and are not interested in technology need face-to-face communication for a major part of rehabilitation, while rehabilitees who reflect benefit and are enthusiastic about using technology need incrementally less face-to-face interaction and feel that web-based coaching provides sufficient support for rehabilitation.

Conclusions: The findings show that persons affected by heart disease have had different experiences with technology and expectations of counseling, while all rehabilitees expected technology to be easy to use and their experiences to be smooth and problem-free. The results can also be used more widely in different contexts of social and health care for the planning of, and training in, remote rehabilitation counseling and education.

Trial registration: ISRCTN Registry: ISRCTN61225589.

Keywords: coronary disease; rehabilitees’ experience; focus group; qualitative study; grounded theory; remote rehabilitation; e-health; e-rehabilitation; secondary prevention

Introduction

Cardiovascular diseases are the most common cause of death globally, more common than any other diseases [1]. Cardiac rehabilitation (CR) is a secondary prevention intervention for cardiovascular diseases and includes efforts to reduce behavioral risk factors such as tobacco use, unhealthy diet, obesity, physical inactivity, and alcohol use and psychosocial problems such as depression [1,2]. However, many persons with coronary artery disease (CAD) are not aware of opportunities to participate in rehabilitation programs or they choose not to participate in CR for a number of reasons, such as a long distance to a facility [3,4]. It is necessary to develop new methods of rehabilitation, such as web-based programs [5]. With global digitalization, rehabilitation increasingly uses technology. Remote rehabilitation programs use a range of
remote technologies and web-based applications. Remote counseling means professionally-coached and professionally-monitored rehabilitation with a clearly defined beginning and end [6, 7, 8]. Digital e-health tools include wireless digital devices like smartphones and tablet computers, self-care and self-monitoring devices, video call services such as Skype for Business, wearable and ingestible sensors and various digital applications, and virtual reality made possible by new technology and robots [9]. Digitalization requires new attitudes and skills from rehabilitees and professionals [10].

The use of remote technology in CR has been studied mainly by quantitative methods [e.g., 11]. Research has focused on the effectiveness [6] and usability [12] of technology-intensive interventions. Another focus area has been issues related to rehabilitees’ physical activity [6, 13, 14] and lifestyle change [8, 15]. However, research has rarely looked at the role of remote technology in CR [14, 16]. There is a need to expand understanding of the experiences of persons who use or have used remote technology for rehabilitation, and estimate it’s benefits and difficulties [7, 8, 11].

The aim of this study was to gain understanding of cardiovascular rehabilitees’ experiences with modern technology and determine the effects of remote technology and expectations of remote counseling on rehabilitees during a rehabilitation process. This study used a grounded theory (GT) approach. Data was analyzed using Glaser's inductive GT approach.

**Methods**

**Recruitment**

The study was conducted from 2015 to 2017 in Rehabilitation Centre Peurunka, Finland, where the Social Insurance Institution of Finland arranges regular CR courses. The study is part of the remote technology in cardiac rehabilitation study registered at the ISRCTN Registry under ISRCTN61225589. The Ethics Committee of the Central Finland Health Care District has approved the study.

Qualitative interviews were conducted at the rehabilitation center during four focus-group discussions (10 women and 28 men), each interview lasting 30 to 60 minutes. The number of subjects was determined according to data saturation, which means that there are any more experiences about the topic [17]. 82% of the subjects had undergone coronary angioplasty (PTCA) and 10 % had undergone coronary artery bypass (CABS) about 3–12 months prior to rehabilitation. Most subjects had a computer (85%) and used the internet (92%). Many had mobile phones (59%) and tablets (37%), and several used wrist activity trackers (37%). These statistics are similar to those obtained during testing of other European cardiac patient populations [18]. According to Glaser's inductive GT approach baseline information and characteristics of the subjects were collated later for this article and were not taken into account in the analysis [17] (Table 1).
**Table 1. Description of participants.**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Under 55</th>
<th>55 and over</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age n (%)</td>
<td>20 (51%)</td>
<td>19 (49%)</td>
<td>N = 39</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>17 (85%)</td>
<td>12 (63.2%)</td>
<td>29 (74.4%)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocational or course-form school or</td>
<td>13 (68.4%)</td>
<td>14 (73.7%)</td>
<td>27 (71.1%)</td>
</tr>
<tr>
<td>other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College level education</td>
<td>3 (15.8%)</td>
<td>3 (15.8%)</td>
<td>6 (15.8%)</td>
</tr>
<tr>
<td>University of applied sciences</td>
<td>2 (10.5%)</td>
<td>2 (10.5%)</td>
<td>4 (10.5%)</td>
</tr>
<tr>
<td>University</td>
<td>1 (5.3%)</td>
<td>0 (0%)</td>
<td>1 (2.6%)</td>
</tr>
<tr>
<td><strong>Time of operation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–3 months from rehabilitation</td>
<td>1 (5.6%)</td>
<td>0 (0%)</td>
<td>1 (2.7%)</td>
</tr>
<tr>
<td>3–12 months from rehabilitation</td>
<td>12 (66.7%)</td>
<td>11 (57.9%)</td>
<td>23 (62.2%)</td>
</tr>
<tr>
<td>Over 12 months from rehabilitation</td>
<td>3 (16.7%)</td>
<td>6 (31.6%)</td>
<td>9 (24.3%)</td>
</tr>
<tr>
<td>No operations</td>
<td>2 (11.1%)</td>
<td>2 (10.5%)</td>
<td>4 (10.8%)</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet yes/no</td>
<td>12 (100%) / 0 (0%)</td>
<td>13 (86.7%) / 2 (13.3%)</td>
<td>25 (92.6%) / 2 (7.4%)</td>
</tr>
<tr>
<td>Computer yes/no</td>
<td>11 (91.7%) / 1 (8.3%)</td>
<td>12 (80%) / 3 (20%)</td>
<td>23 (85.2%) / 4 (14.8%)</td>
</tr>
<tr>
<td>Tablet PC yes/no</td>
<td>6 (50%) / 6 (50%)</td>
<td>4 (26.7%) / 11 (73.3%)</td>
<td>10 (37%) / 17 (63%)</td>
</tr>
<tr>
<td>Smartphone yes/no</td>
<td>7 (58.3%) / 5 (41.7%)</td>
<td>9 (60%) / 6 (40%)</td>
<td>16 (59.3%) / 11 (40.7%)</td>
</tr>
<tr>
<td>Physical activity tracker yes/no</td>
<td>4 (33.3%) / 8 (66.7%)</td>
<td>6 (40%) / 9 (60%)</td>
<td>10 (37%) / 17 (63%)</td>
</tr>
</tbody>
</table>

**Intervention**

The total duration of rehabilitation is 15 days spread between three 5-day periods over a time span of 12 months, and rehabilitation takes place in a rehabilitation center. The aim of rehabilitation courses is to help a rehabilitee to adapt to the life cycle affected by heart disease and improve his or her functional capacity and ability to work [19]. A multidisciplinary team of professionals includes a doctor, a physical therapist, a nurse, and optionally a social worker, a psychologist, and a dietitian. The remote rehabilitation program used a web-based application (m-coach Movendos, Finland) and a wrist activity tracker (Fitbit Charge HR®, USA). Before intervention, the subjects were interviewed and asked questions like, “Tell me about your experience with modern technology,” and “What are your expectations of remote counseling?” The ATLAS.TI computer software, which enables data storage, organization and retrieval, was utilized for data analysis.
Analytic approach and data analysis

We decided to apply a methodology proposed by GT approach because we found GT useful in getting to understand the rehabilitees’ subjective experiences for generating a substantive theory in a relatively new research area [17, 20]. This study examines the rehabilitees’ experiences and expectations of technology prior to using remote technology. During qualitative group interviews, the rehabilitees described their experience with modern technology in areas such as the use of computers and social media.

Theoretical sampling guided the data collection process. We collected and analyzed data concurrently, and as the analysis proceeded the research question became more focused. Data was collected through four informal interviews and analyzed using the constant comparative model (CCM). There are two types of coding: substantive coding, which includes both open and selective coding process, and theoretical coding. The process progressed from the open coding of data to the emergence of a core category followed by delimiting of data collection and analysis for selective coding to theoretically saturate [17, 20].

In open coding, first we analyzed incidents and compared them to other incidents, creating as many concepts as possible, coding substantively. Next, we identified the properties and dimensions of each subcategory. Being theoretically sensitive, data was closely read and questioned. We read the interviews’ transcriptions line by line asking, “What is this about?” Then we assigned codes to each sentence or paragraph. As the codes recurred, we compared them, looking for similarities and differences. Finally, we grouped the concept into subcategories creating as many subcategories as possible, and then integrated the subcategories into the category. Data analysis was continued as long as the category was theoretically saturated. During this CCM process, we recorded our ideas and notions, which helped us process the data. This study will remain at the category level (Figure 1), and future studies will address selective coding, which is the process of selecting the core category and then systematically relating it to the other categories [17].

Figure 1. Process of substantive coding.

The following example describes the creation of a subcategory for “being uninterested.” The analysis began with open coding. We analyzed data on the diversity of the experiences of the rehabilitees of the use of technology, as well as their attitudes toward, and expectations for, remote counseling. This perspective expanded from the rehabilitees’ responses and debates. Constant comparison convinced us that all codes
essentially described or explained how each rehabilitee used technology or what his or her attitude towards technology was. We analyzed data on the diversity of the experiences of the rehabilitees for technology using and expectations of remote counseling.

**Categorizing.** Next we named properties as a) “using technology occasionally,” b) “limiting to use,” c) “challenging problem-free technology,” and d) “activating empowerment counseling.” We named the subcategory for this experience as “being uninterested.” An example of the process is below (Table 2).

<table>
<thead>
<tr>
<th>TEXT</th>
<th>CONCEPTS (code)</th>
<th>PROPERTY</th>
<th>SUBCATEGORY</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I'm not terribly interested in that remote stuff, because... well, I use the computer at work every day... That e-mail reading, I may go and check my mail once a week. It’s not in a way... maybe it just isn’t my thing... it’s no trouble to surf in the Internet in the evening. Only when I must. I can check e-mail – if a bill has arrived, I can pay it there.” (Male, 44, focus group 2)</td>
<td>“I'm not terribly interested in that remote stuff, because... well, I use the computer at work every day... That e-mail reading, I may go and check my mail once a week. It’s not in a way... maybe it just isn’t my thing... it’s no trouble to surf in the Internet in the evening. Only when I must. I can check e-mail – if a bill has arrived, I can pay it there.”</td>
<td>Using technology occasionally</td>
<td>Being uninterested</td>
<td>identifying e-usage</td>
</tr>
<tr>
<td>“… but I don't like that one's got to be, like, twenty-four hours a day available.” Female, 59, focus group 4</td>
<td>“… but I don't like that one's got to be, like, twenty-four hours a day available.” Female, 59, focus group 4</td>
<td>Using technology occasionally</td>
<td>Being uninterested</td>
<td>identifying e-usage</td>
</tr>
<tr>
<td>“I've noticed sometimes that when I've been at it for some time, the machine has broken down in the middle of my work so no-one could do anything. So, that is, of course, the downside of the thing...” (Female, 59, focus group 4)</td>
<td>“I've noticed sometimes that when I've been at it for some time, the machine has broken down in the middle of my work so no-one could do anything. So, that is, of course, the downside of the thing...” (Female, 59, focus group 4)</td>
<td>Using technology occasionally</td>
<td>Being uninterested</td>
<td>identifying e-usage</td>
</tr>
<tr>
<td>“I guess now – real nice if sometimes one could be reached out to from there by e-mail or something else...” (Male, 44, focus group 2)</td>
<td>“I guess now – real nice if sometimes one could be reached out to from there by e-mail or something else...” (Male, 44, focus group 2)</td>
<td>Using technology occasionally</td>
<td>Being uninterested</td>
<td>identifying e-usage</td>
</tr>
<tr>
<td>“I'm waiting for it and I'm truly interested, as if I were waiting for something like a spark. That it is something, something like, motivating...” (Male, 45, focus group 3)</td>
<td>“I'm waiting for it and I'm truly interested, as if I were waiting for something like a spark. That it is something, something like, motivating...” (Male, 45, focus group 3)</td>
<td>Activating empowerment counseling</td>
<td>Being uninterested</td>
<td>identifying e-usage</td>
</tr>
</tbody>
</table>

The constant comparison of properties resulted in hypotheses about relationships between the subcategories. We continued to collect and analyze data until no new subcategories emerged and the subcategories were saturated, and a category was thereby founded. The category was named as follows “rehabilitees identifying e-usage in the process of behavior change.” In theory, the theme of the study is linked with, for example, usable technology, health coaching and remote rehabilitation publications and research. The study was also theoretically sampled to reveal links with the generated GT and to increase theoretical sensitivity in continued analysis [21].
Results

The descriptors of the rehabilitees’ prior technology experience are “feeling outsider,” “being uninterested,” reflecting benefit,” and “enthusiastic using.” The category “identifying e-usage” describes the essence of rehabilitees’ different experiences of using technology and identifying their usage (Figure 2).

Figure 2. Cardiac rehabilitees’ identifying of e-usage in the process of behavior change.

The first subcategory of “feeling outsider” based on the experience of rehabilitees, who fear that they are not sufficiently skilled computer users to participate in remote rehabilitation. The experiences of these rehabilitees are divided into two subgroups: those who have a computer but do not actively use it, and those who do not have a computer or user experience. In the following samples, two rehabilitees discuss being outsiders to technology.

"Because I don’t have a computer, I am a total outsider. So… because of this, I’m not so terribly interested. The only thing I know about this is that the self-tracking is great.” (Male, 74, focus group 1)

"That technology hasn’t really come… My wife taught the computer… supported, well, taught – so I went to the courses. And the kids did. I thought that if I’m still starting to tinker, then won’t be enough hours in the day to learn.” (Male, 60, focus group 1)

These rehabilitees feel they do not need a computer, and only few of them use computers at work. Others have limited access to the internet, often only at work. If they need help with technology, they request it from friends or family members. Rehabilitees feel they have no time for, or interest in, studying computer usage, and the English language is also difficult. Concerns of technology’s impact on health and security seem to be other reasons for avoiding computer use. In the following sample, a rehabilitee discusses his learning experiences with information technology.
”Better that it leaves you, like if you go the bank computer, then everything gone. It doesn’t help there. Still it doesn’t. This isn’t the only reason, but… I’m not interested. I’ve taken two computer courses, though. Last time I went to apply for a bus-driving license, and it was two weeks. And when I went and when I came back I was as dumb as I going there, and I come back... Of course, I know the time to buy one is coming, but I’m holding it off for as long as I can.” (Male, 63, focus group 4)

The following rehabilitee has not yet established expectations for counseling.

“I’m not really sure… waiting to see what comes.” (Male, 64, focus group 2)

For these rehabilitees, technology is uninteresting and difficult to understand. They are aware of its applications, such as Facebook, but these are foreign to them. Nevertheless, their positive expectations towards remote technology encounter are apparent, although they do not expect anything amazing from web-based counseling. They need guidance to encourage them in the use of easy-to-use technology.

The second subcategory is “being uninterested” based on the experience of rehabilitees, who have used technology and experimented with social media. Their experiences are limited to necessary and occasional uses such as paying bills, renewing book loans, and reading e-mails. If they encounter a technical problem their interest fades. They are not interested in using technology to connect socially via e-mail and social media. Problems with information security worry them. In the following sample, a rehabilitee explains why he is not interested in technology.

”I’m not terribly interested in that remote stuff, because… well, I use the computer at work every day…. That e-mail reading, I may go and check my mail once a week. It’s not in a way… maybe it just isn’t my thing… it’s no trouble to surf in the internet in the evening. Only when I must. I can check e-mail – if a bill has arrived, I can pay it there.” (Male, 44, focus group 2)

The following rehabilitee discusses problems related to technology and social media.

“…I’ve noticed sometimes that when I’ve been at it for some time, the machine has broken down in the middle of my work so no-one could do anything. So, that is, of course, the downside of the thing…” (Female, 53, focus group 4)

”But then what like really irritates and frustrates me and just can’t interest me – although I’m there in Facebook because my nephew forced me there.” (Female, 53, focus group 4)

The following rehabilitees discuss coaching.

”I’m waiting for it and I’m truly interested, as if I were waiting for something like a spark. That it is something, something like, motivating, and... well... I can’t say, but it like maybe not now for sure every week. If once a month, certainly something could come... a reminder.” (Male, 45, focus group 3)

“When I could enter inputs in there, and if my own activities could be there, then I would be like a response: Is this the right or wrong direction, and… And that’s when it’s really somebody, something and someone monitoring what you’re doing.” (Female, 49, focus group 2)
These rehabilitees value easy-to-use technology in their daily lives and expect it to be a motivator and to spark interest but believe that technology also demands a coach who gives feedback, assigns weekly tasks, and issues regular reminders.

The third of subcategory “reflecting benefit” emerged with four characteristics: “useful,” “feeling technology useful,” “easy-of-use technology,” and “interactive tracking tool.” These persons remain interested in technology for only as long as they have the indispensable need for it in everyday life. In the following, a rehabilitee discusses his use of technology in free time.

“Just like the pharmacy, like in that do I medications? In that case, is the prescription still valid? And like that, just in that way… Yeah, it is good to look… there are plenty of medicines left, and… Do I have to bring in, or order a new prescription? And other things, just in that way. What now happens every day or when it’s needed so… so I don’t go surfing on every webpage… Yes, with the children I use it, and with friends I like to connect over the internet.” (Male, 65, focus group 4)

The experiences of these persons fall into two categories. First, there are rehabilitees who find technology difficult and need time to learn it. For example, they find remembering passwords difficult. They need external help to learn security procedures and computer usage.

“And for paying bills I use it most, too. Some information when it’s needed, well yes, I try to find it from there then. And if someone wants to find the frustrating side, well, those passwords frustrate me, because they always go missing… and a password has gotten lost, and… I can’t go there anymore. Of course I can create a new password, but it is such a bother – just forget about it. And I read magazines in the computer, and…” (Male, 68, focus group 4)

To persons in the second category, the use of technology is not a problem but their attitude towards technology is pessimistic. Since they see technology as something negative they use it only when necessary; for example, to search for information. Some rehabilitees have experience in digitally monitoring physical activity. In the following example, a rehabilitee discusses the usability of technology.

“…But then the computer, when it runs all day – I don’t want that. That’s why I don’t open the computer in the evening… Of course it’s easy always that everything could be, like as easy-to-use as possible, because that’s why I don’t do it, when I could use it for remote technology. But it should be as easy-to-use as possible: it should be as automatic as possible, this thing. It, I think should be as flexible as possible.” (Male, 57, focus group 2)

In the next example, a rehabilitee discusses self-monitoring and coaching.

“I’m waiting and I’m interested. Yes, of course, this here now gives a little push in the pants. I’m already moving pretty well, that’s what this thing around my arm tells me… Yeah… and then yes, I have the Sport Tracker on my phone, also. When I go somewhere, I tell it to draw a map, and I see the time and all that.” (Male, 34, focus group 3)

“Let’s put it in this way: I’m not actually now that way from being pushed, yeah. Yes it comes from my own desire. The main purpose is monitoring: it’s for that. It’s interesting to follow what happens if you change some exercise habits, and you can see from this, what changes have happened in the background. Very O.K.” (Male, 57, focus group 2)
These rehabilitees expect technology to be easy to use and also expect it to enable communication. Essentially, they do not need a coach but they need tools for self-monitoring and helping to improve their health.

Rehabilitees experience in the fourth subcategory “enthusiastic using” show a positive attitude towards technology and have used it for a long time in a variety of ways, both in everyday life and at work through smartphones, tablet PCs, and desktop computers. In the following examples, enthusiastic users discuss the use of technology.

“Well, laptops are always open less when you have a smartphone. In other words, I read those e-mails easily on my phone. That way I don’t go and turn on the laptop.” (Female, 61, focus group 2)

“More there is, of course, invoice writing and information retrieval, but of course electrical diagrams, and… Sometimes some programming, logic, some small logic programming, and something like that.” (Male, 64, focus group 3)

These persons actively follow e-mails through smartphones. Many of them have mobile health and exercise activity applications (e.g., Sports Tracker). They are involved in social media such as Facebook and WhatsApp to keep in touch with friends and relatives. Internet problems are not particularly annoying and, if necessary, they contact external specialists. They are interested in technology and want to develop their skills in it. In the following example, rehabilitees describe what they expect from technology and from a coach.

”Modern opportunities. And if now, of course… from where soon could come a little spark, and that spark continues than exercise could begin. And it’s really the same benefit. And then, of course, if nothing’s heard from there. It sounds real good, and then reminders. Something like you can write comments, and…” (Female, 61, focus group 2)

“Maybe this is kind of a simple-enough device. When there’s not anything amazing in here now, then owing to that, it’s comfortable to use: It’s not too complicated.” (Male, 52, focus group 1)

These rehabilitees expect web-based intervention to be simple, motivating, easy-to-use, and interactive. They also expect coaches to give feedback if anything is missing. Easy-to-use technology enables self-tracking.

In table 3 is summarized the study’s results in the category of identifying the e-usage resulted in the emergence of four subcategories.

| Table 3. Rehabilitees identifying the e-usage in the process of behavior change. |
Discussion

The study shows that the diversity of rehabilitees as technology users and their different needs for technology should be taken into account in rehabilitation planning (Table 3). The four subcategories are “feeling outsider,” “being uninterested,” “reflecting benefit,” and “enthusiastic using.” Some rehabilitees whose e-role is “outsider” or “occasionally using” need face-to-face communication for a large part of rehabilitation, while persons whose e-role is “usefully” or “diversely” need incrementally less face-to-face interaction and feel that web-based behavior change coaching provides sufficient support for their rehabilitation. However, all rehabilitees hope that remote technology would be simple, flexible, and easy to use and learn (Figure 2), which would enable participation in an e-process. Participation in the remote rehabilitation program, like in this research, required skills, for example, in web-based logins and reading and answering tasks and messages. Activity self-monitoring requires downloading an activity tracker program into the computer and synchronizing the program with the computer.

In the “feeling outsider” subcategory based on the experience of rehabilitees have a positive attitude toward technology, yet they do not see technology important for themselves. Their mindset supports previous research results [e.g., 22, 23]. It is important to encourage rehabilitees’ abilities to use technology devices, for abilities thus acquired make them more receptive to the use of technology [24]. Previous studies have also found that digital skills of outsiders have improved but are still insufficient [25]. Rehabilitees’ ability to use technology is ensured by adequate internet technology support [26]. It is also important that applications and instructions are available in the user’s own language.

In the subcategory of “being uninterested” based on the experience of rehabilitees, who were not interested in technology and showed negative attitudes towards it. They felt that easy-to-use technology encourages technology use while technology that does not work frustrates, and they felt constant communication on social media irritating. However, when their expectations of technology are exceeded, the resulting experience is positive and pleasant [27, 28] and maintains motivation [31], also in previous studies. They expect coach contact to maintain motivation. Previous research has shown that interventions based on behavior change theory are more effective than those lacking a theoretical basis [14, 29, 30].
Rehabilitees in the “feeling outsider” and “being uninterested” subcategories need face-to-face counseling during remote rehabilitation. Supportive guidance on technology use is needed for rehabilitees in the “feeling outsider” subcategory, while persons in the “being uninterested” subcategory need to be motivated in order to create positive experiences. Maintaining a spark of interest and motivation requires a motivator and a coach who gives feedback, weekly assignments and regular reminders [32]. Previous research has shown that interventions based on behavior change theory motivated more than those lacking a theoretical basis [14, 29, 30].

Rehabilitees in the “reflecting benefit” subcategory use technology daily, and technology challenges they encounter stem from technical problems and attitudes. They expect applications to be easy-to-use, secure, and in their own language. Perceived ease of technology use influences perceived usefulness, and together these affect the intention to use technology and, further, and still for real use (usage behavior) [31]. The Technology Acceptance Model (TAM) has also been applied to the health care context [27, 28]. In addition perceived usefulness with perceived value play a role in the acceptance of technology [33]. The minimization of application risks increases trust in the systems [28, 33]. These rehabilitees’ acceptance of technology increases when applications are easy to use and in their own language. These rehabilitees use social media as a means of communication and regard the possibility to interact as important. Social media, such as Facebook, Twitter, Pinterest, and Instagram, is part of their day-to-day life [34]. Social media can be used in rehabilitation; for instance, rehabilitees may create their own support group (such as a closed Facebook group) [35], which would make possible easy-to-use peer group discussion regarding the rehabilitation process. Health care applications for rehabilitation allow users to receive and interact with assignments, record and review data, receive automated feedback, and connect with other users or health care professionals [30]. These rehabilitees need little more than automated feedback, mainly interactive coaching which gives a little push and supports a lifestyle change.

Rehabilitees in the “enthusiastic using” subcategory accept technology as an integral part of their everyday lives. According to statistics, smartphone use is increasing [36], and these rehabilitees use smartphones actively. Mobile health applications are increasingly popular, and smartphone users had downloaded mobile health applications [37]. They are keen users of sufficiently coach-supported web-based intervention applications to boost motivation for physical activity [14, 38, 39]. According to studies, these rehabilitees participated in web-based e-rehabilitation, which reduces face-to-face interactions [39, 40]. Asynchronous web-based rehabilitation is particularly well-suited to an active user who has adequately mastered technology and is interest in it. Easy-to-use and smoothly-functioning technology allows extensive in personal activity and body function monitoring; in other words, for self-tracking. The recently-termed “quantified self” notion has emerged to promote “self-knowledge through numbers.” [9] Health change coaching is based on behavior change theory, motivational strategies, and communication techniques [40]. Rehabilitees’ experiences of and attitudes towards technology, on the other hand, also provide information on how to implement a counseling theory and methods when planning remote rehabilitation. The coach should conduct individual risk factor assessment and management, exercise training, self-management of modifiable risk factors, education, and psychosocial support [30]. Professional health coaches can help rehabilitees increase self-direction, set specific goals and take action to achieve and sustain health-supporting behaviors [30, 42, 43]. In addition to this self-monitoring, an easy-to-use interface is a desirable feature in mobile applications for promoting physical activity. Examples of these interfaces are integration of biosensors which collect information from body and life systems, such as ECG monitoring; physical activity monitoring; heart rate, blood pressure and blood glucose measurement [29]; and digital stethoscopes; thermometers and weight scales [9].

The topic is important because remote rehabilitation is already being implemented and will continue to be implemented be in the future due to increasing digitization [17, 42]. Technology-related studies show that
remote technology is most successful when it is simple and designed so that it can be understood and used easily [23]. Also, easy-to-use technology produces positive and successful experiences [43]. As rehabilitees’ skills develop they gain self-esteem and are empowered to expect positive, successful experiences [22, 25]. Remote rehabilitation must take into account the abilities of each rehabilitee in learning, cognition, and motor and perceptual skills [22,26,44] and must allow the person ample time to learn to master new skills [22]. Previous study has found four factors, which affect the acceptance and use of technology: gender, age, prior experience, and whether or not the usage is voluntary (Unified theory of acceptance and use of technology UTAUT) [45]. In the future, the results of the accepted experience of “feeling outsider,” “being uninterested,” “reflecting benefit,” and “enthusiastic using” combined with previous research results will be taken into account. This could guarantee better conditions for remote technology to be more acceptable and therefore more meaningful and more effective. The study results can also be utilized in designing remote rehabilitation and health coach training programs. There is little quality research describing the experiences of CHD patients, and a need exists for mixed methods research for the development of easy-to-use health technology.

There are weaknesses to be considered when interpreting the findings of this study. Participants in the study discussed their experiences of the technology at the beginning of rehabilitation and everyone was given the opportunity to share experiences. The interviewer created an accepting atmosphere and encouraged silent participants. Despite this, it is possible that the participants were trying to please the group when answering questions. There are also advantages in this study. The results have attracted interest and their relevance, credibility, and usefulness have been identified as important when implementing remote rehabilitation. The results have been also used in comparative rehabilitation groups, in musculoskeletal system, and work ability rehabilitation.

Conclusions

The aim of this study is to explore in detail rehabilitees’ experiences with remote technology and expectations of counseling. The results is the rehabilitees’ technology experience “feeling outsider,” “being uninterested,” “reflecting benefit,” and “enthusiastic using”, which relates to rehabilitees identifying their e-usage. The results help to identify different technology users among potential rehabilitees and determine what attitudes and usage levels must be taken into account when developing remote rehabilitation. The category formed into four subcategories which define the rehabilitees’ technology experience. The results can also be used more widely in different contexts of social and health care for the planning of, and training in, remote rehabilitation/ e-rehabilitation counseling and education.

References


