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Experiences of an Internet-based aural rehabilitation (IAR) program for hearing aid users: a qualitative study

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ABSTRACT

Objective: Internet interventions for hearing aid (HA) users have been shown to be effective in helping persons with hearing problems. As earlier research refers to objective data on these effects, little is known about how participants experience the Internet interventions subjectively. The aim of the present study was to explore participants’ experiences of an Internet-based aural rehabilitation (IAR) program for HA-users, and to explore the possible subjective benefits of such a program.

Design: A qualitative exploratory design was implemented involving semi-structured telephone interviews.

Study sample: Interviews were conducted with 20 participants (9 men and 11 women) who had completed an IAR program for HA-users. The participants were 57–81 years old and had used HAs for 2–25 years.

Results: The results are organised in three main categories: general experiences associated with participating in the program, knowledge obtained from the program and perceived impact of taking part in the program.

Conclusions: The overall results indicate positive experiences of the IAR program, and an overarching theme of increased self-esteem was identified. The findings provide some valuable information for developers of future IAR programs.

Abbreviations: AR: Aural rehabilitation; IAR: Internet-based aural rehabilitation; HA: Hearing aids; HL: Hearing loss

Introduction

Hearing loss (HL) causes communication failures in peoples’ everyday lives, which may lead to social withdrawal and reduced quality of life (Monzani et al. 2008; Hawkins et al. 2012). Counseling is most crucial for addressing these shortfalls in combination with rehabilitation (AR) programs. According to Hawkins (2005), the most cost-effective way of delivering AR is through the use of the Internet. The use of the Internet to provide interventions and health care information has increased in recent years, facilitating improvements of clinical encounters in a cost-effective manner and enabling clinicians to reach out to a significant proportion of HA-users (Swaneepol and Hall 2010; Molini-Avejonas et al. 2015). For example, Thorén et al. (2014) showed, in a randomised controlled trial, significant improvements in activity and participation in an intervention group that completed an Internet-based AR (IAR) program, which were maintained over three months, compared to control group which did not improve. Similar group programs assessing activity and participation have been tested in several studies, for example, by using telephone and/or the Internet to provide an HA follow-up group program (Lundberg, Andersson, and Lunner 2011; Thorén et al. 2011, 2014; Malmö et al. 2015; Ferguson et al. 2016; Malmö et al. 2017).

Another cost-effective way of delivering AR is through the use of the Internet. The use of the Internet to provide interventions and health care information has increased in recent years, facilitating improvements of clinical encounters in a cost-effective manner and enabling clinicians to reach out to a significant proportion of HA-users (Swaneepol and Hall 2010; Molini-Avejonas et al. 2015). For example, Thorén et al. (2014) showed, in a randomised controlled trial, significant improvements in activity and participation in an intervention group that completed an Internet-based AR (IAR) program, which were maintained over three months, compared to control group which did not improve. Similar group programs assessing activity and participation have been tested in several studies, for example, by using telephone and/or the Internet to provide an HA follow-up group program (Lundberg, Andersson, and Lunner 2011; Thorén et al. 2011, 2014; Malmö et al. 2015; Ferguson et al. 2016; Malmö et al. 2017).
However, less is known about how participants and audiologists experience these Internet interventions. Qualitative research on individual experiences of Internet interventions can provide a deeper understanding of experiences relevant to people with HL and has the ability to generate new information that one otherwise may fail to notice (Knudsen et al. 2012). For example in a study by Ferguson et al. (2016), the authors assessed first time HA-users feedback by a range of quantitative and qualitative measures, soughing ideas for future development of educational programs delivered partly via the Internet. Clients commented that the program needed to be informative, easy to use, include family members and incorporate a means for clients to access information after the program has finished. Another qualitative study on Internet interventions focussed on audiologists and new HA-users’ experiences of an Internet-based support system (Brännström et al. 2016). The authors found generally positive experiences of the support system, although both the audiologists and the new HA-users contributed to new insights in terms of intervention development. The audiologists desired future improvements of the system that addresses the needs of a broader range of clients, and the HA-users desired improvements in the online log-in procedure which is necessary for facilitating usage.

Considering the broad possibilities of reaching and treating HA-users via the Internet, it is important to identify possible outcome mediators of Internet interventions in order to maximise the effectiveness of such interventions (Greenwell and Hoare 2016). Accordingly, we were interested in identifying and exploring HA-users’ individual experiences of an IAR program (Thorén et al. 2014). The investigation in the present study is based on a study previously conducted by Thorén and collaborators and reported by Thorén et al. 2014. The aim of the present, qualitative, study was threefold: to explore participants’ (Thorén et al. 2014) experiences of an IAR program for HA-users, to explore what element of the program the participants find as most important and to explore the possible subjective benefits of the program.

Methods

In order to explore the participants’ experiences of the IAR program, a qualitative exploratory design was implemented based on semi-structured telephone interviews.

Sampling and recruitment

In all, 36 HA-users (95%) who took part in the original study’s intervention group (Thorén et al. 2014) were contacted by email and invited to participate in the present study, approximately six months after they completed the intervention. Twenty of them (9 men and 11 women) (53%) accepted the invitation. The participants, who were 57–81 years old and had used HAs for 2–25 years, received additional information about the study by mail. They also received a consent form and were informed that their participation was voluntary, that their privacy would be protected, and that they could withdraw their consent at any time. After signing the consent form, the 20 participants were interviewed.

Procedure

An interview guide addressing the following three main areas was produced: reasons for participating in the IAR program, the participants’ overall experiences of the program and its individual elements and the possible benefits experienced from the program (see Supplementary Appendix 1). In order to gain as much information as possible from the participants, the interviewer’s prior knowledge of the IAR program was limited. The interviews were carried out by three interviewers that were trained in qualitative interviewing. The date and time of each interview were communicated via email. Each interview lasted on average for 13–35 minutes and was audio recorded and later transcribed by the performing interviewer.

The participants were encoded with a research number in order to maintain their privacy. The data collection was approved by the Research Ethics Group at the Department of Logopedics, Phoniatrics and Audiology, Lund University, Sweden. All recorded material was archived at the same department.

The IAR program

The examined IAR program reported by Thorén et al. 2014 lasted five weeks and consisted of: (1) reading material, including access to a book about hearing and HAs (Elberling and Worsøe 2006) and a compendium of communication strategies that were inspired by those incorporated into the Active Communication Education program (Hickson, Worrall, and Scarinci 2007; Öberg, Bohn, and Larsson 2014); (2) home training in the form of instructions and weekly assignments related to the reading material; (3) individual interaction with an audiologist online and personal responses to submitted assignments; and (4) an online discussion forum shared with the other participants in the intervention group, where new discussion topics were posted each week (without any interaction with the audiologist). The IAR program was offered to the participants in the intervention group whilst the control group was referred to a waiting list. For details of the study design and the IAR program, see Thorén et al. (2014).

Analysis

The interview transcripts were interpreted in accordance with content analysis using an inductive approach (Graneheim and Lundman 2004; Hsieh and Shannon 2005; Knudsen et al. 2012). The first two authors verified the interview transcripts by listening to all recorded interviews and then making some minor linguistic corrections. All interview transcripts were then read several times by the first two authors to obtain a good overall sense of the material. The transcripts were divided into units, which were then

| Table 1. Examples of meaning units, condensed meaning units, and codes. |
|---------------------------|------------------|------------------|
| Meaning unit | Condensed meaning unit | Code |
| I followed it [the book], I like it, I benefited from it. I still have it and I can look up information whenever I want. (P1) | The book was beneficial and is reusable | Positive experience of the book |
| It was really good, the compendium was really good, both theory and practice. (P9) | The compendium covered both theory and practice | Positive experience of the compendium |
condensed (see Table 1) in order to make the meaning units shorter while maintaining their essential information (Krippendorff 2013). Meaning units were coded and categorised in order to bridge the gap between the transcribed interviews and their interpretations. According to Krippendorff (2013), to add reliability to the coding process coders need to have some familiarity with and share a sense of understanding of the information they are looking at. In the present paper, two authors with professional background as licenced audiologists cooperated in the coding process. A tentative set of categories and subcategories of meaning units was formed and then discussed, criticised, and modified by the two authors, yielding a final set of categories. This final set was applied on the condensed meaning units by the first author, resulting in the deletion and rephrasing of some categories and the addition of a few new subcategories. The new set of categories was then applied by the two authors individually to a sample of the material to be analysed, in order to maximise the relevance of the categories. A consensus regarding categories and subcategories was then reached after a discussion. In order to assure completeness and unambiguousness of the results, no unit was excluded due to lack of descriptive terms and no unit fell between two subcategories/categories or was presented by two different descriptive terms (Krippendorff 2013). The categories and subcategories represented the manifest content (what is visible). Three main categories emerged and the latent content (the underlying meaning) of the categories was finally formulated into a theme (Ryan and Bernard 2003). A selection of participant quotes representative of the research findings will be presented throughout the result section.

Results

In line with the aims of the present study, the authors were interested in what the transcripts revealed about the individual experiences of the IAR program and in exploring the probable benefits of the program. The meaning units were separated into three main categories, i.e. general experiences associated with taking part in the program, knowledge obtained from the program and perceived impact of taking part in the program, as well as 14 subcategories (see Table 2).

A theme emerged when reviewing the categories, subcategories, and meaning units: Increased self-esteem as a process of becoming more knowledgeable about HL and having confidence in the ability to deploy knowledge practically (see Table 2). The awareness of the HL gained from attained or revisited theoretical knowledge, and was obtained by completing the program. Together with having confidence in how to deploy knowledge practically, this seemed to be of great importance to the everyday communication of HA-users who participated in the IAR program. As HL influences communication in people’s daily life, these aspects are of crucial importance to the interpersonal interactions of HA-users.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Increased self-esteem as a process of becoming more knowledgeable about HL and having confidence in the ability to deploy knowledge practically</th>
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<tr>
<td>Categories</td>
<td>General experiences associated with taking part in the program</td>
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<td>Subcategories</td>
<td>Positive and valuable experiences</td>
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<td>Knowledge obtained from the program</td>
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<td>The weekly assignments</td>
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<td>The compendium</td>
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<td>The discussion forum</td>
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<td>Revisiting knowledge</td>
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<td>Increased awareness of HL</td>
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<td>Perceived impact of taking part in the program</td>
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<td>Impact on self-esteem</td>
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<td>Actively communicating about HL</td>
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<td>Employing communication strategies</td>
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<td>in everyday life</td>
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<td></td>
<td>Increased social activities</td>
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<td></td>
<td>Impact on HA-use</td>
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HA: hearing aids; HL: hearing loss.
the program website, including the discussion forum, was frequently perceived as complicated and not user friendly. These technical problems were interpreted as negative experiences of the program.

We needed log-ins and user-names to answer the weekly assignments, and that wasn’t clear enough for me. [Those responsible for the program] made all the technicalities too complicated/…/it all made me miss out on participating. (P7)

For example, many participants found it technically complicated to participate in the discussion forum, and were disappointed about missing out on participating.

I tried my best, but during the program I messed up on some technical stuff. For example, I didn’t understand the meaning of "threads"/…/I really wish I could have got in contact with others [in the discussion forum]. But I didn’t. (P17)

Knowledge obtained from the program

Knowledge obtained from taking part in the program was described in four subcategories related to four different elements of the program (see Table 2), and in additional two types of subcategories: revisiting knowledge and increased awareness of HL.

While many participants revisited some previous theoretical and practical knowledge, many also learned some new things from participating in the program. One participant described the information obtained from taking part in the program as the following:

Yes, I can say that it has affected me, this program has explained things to me; I’ve revisited things I already knew about—such as, what happens in one’s environment, and how we perceive our environment, and possible hearing problems that we could experience. I have revisited all that, and maybe even learned new things. (P17)

The book in particular was highly appreciated for providing interesting and beneficial information, even if some participants reported that the volume of reading was quite demanding. It provided the participants with new knowledge or enabled them to recognise previous knowledge, and they considered it comprehensive, legible and easy to read. The book provided good information about HL, HAs and the benefits of using HA.

I highly appreciated the information in the book, for example the text about how hearing aids work and how to take care of them. (P4)

[The book] was very informative and it was, it was a really good learning experience, to gain knowledge about hearing loss and also about the functions of our hearing organs/…/Maybe I could adapt my hearing loss a bit better if I learn something about how it works. (P7)

Another valuable aspect was that the participants were able to refer back to the book occasionally, even after completing the program.

I followed it [the book], I like it, I benefited from it. I still have it and I can look up information whenever I want. (P1)

I’ll tell you that… all parts of [the program] were interesting, and I’ve been using this book as evening reading… it has really been good. Something that… that I have missed in the past… (P10)

The weekly assignments contained practical applications which were generally perceived as concrete and feasible.

It was good with the concrete assignments... (P9)

What I remember the most is the weekly assignments with pictures… [explains the assignments from the compendium]… there is a lot you can do to improve your situation. How you place yourself in the room. And I thought it was really… very concrete and good. (P14)

Moreover, the participants’ experience of the compendium upon which the weekly assignments were based was interpreted either as basic, not bringing new information, or almost consistently revisiting communication strategies acquired prior to the IAR program. On one hand, there was a sense of disappointment suggesting that some participants’ expectations of gaining practical knowledge exceeded the outcome of the program. On the other hand, revisiting already acquired communication strategies was highly appreciated, as was the learning of some new strategies, such as actively communicating about HL.

And also, a lot was about all the different strategies. They were old news to me. I was already familiar with the strategies. (P5)

It was really good, the compendium was really good, both theory and practice. (P9)

I got the opportunity to learn new things [referring to the compendium], and I got things confirmed… which is good. (P17)

Several participants expressed a desire to participate in this kind of IAR program periodically in order to maintain the knowledge gained. Nine participants reported non-adherence to the discussion forum. Thus, it was hard for these participants to see any personal benefits of participating in the discussion forum, even though they appreciated the value of the forum, especially the value of enabling peers the opportunity to share experiences when needed. One participant described the discussion points in the forum as indisputable. A vast majority found it meaningful to read other participants’ comments and said they benefited from empathising the experiences expressed in the forum. Those who actively participated in the discussion forum saw great benefits in sharing experiences with peers over the course of the program.

Then I realized that the narratives were similar to what I… it’s always nice to know that you’re not alone with a feeling. (P4)

[The discussion forum] was interesting, and I’ve learned that [HL-related problems] is a broad area/…/in [the forum] one could read about different problem-solving strategies that other hearing aid-users have tried. (P7)

The IAR program contributed to new or revisited knowledge for many participants. This knowledge made many participants gain an increased awareness of the HL, HAs, and communication strategies. The increased awareness was perceived as broadening the horizon of opportunities, and for some participants it led to greater acceptance of their HL and to being more collaborative in their decision-making with the audiologist.

I was fitted with new ones [HAs] this summer, directly after I completed the Internet program. At that point I was knowledgeable, and could talk to my audiologist at a completely new level, about what hearing aid I should try out. And also in ordinary, daily situations, I am much, much more aware of where I place myself when I’m for example in larger groups of people. I have thought about that in the past, too, but now I am much, much more aware of where I place myself. (P12)

I do believe that this [the program] helped me… to completely accept [the HL], and to take advantage of every opportunity to gain better communication with other people, instead of hiding. (P3)

Perceived impact of taking part in the IAR program

Many participants described the program as a source of knowledge with positive effects on their self-esteem. For example,
several of them stated that their participation in the program had inspired them to ask questions of reiteration or to request communication enhancements in certain situations, i.e. the participants gained the courage to demand improvements. Several participants also stated that they now face HL in a more open manner and they communicate more actively about it.

Every time one take part of something like this [referring to the IAR program], it boosts your self-esteem. (P14)

The more I learn about [the HL], the tougher and cocky I become./ …/That gives me a better sense of self-esteem related to my hearing loss. (P9)

The positive effects of the IAR program on participants’ self-esteem triggered participants to apply gained or revisited knowledge practically in everyday life. For example, many participants described that they had increased their use of communication strategies, some reported using their HA more than prior to the program, and some also reported increased social activities.

Yeah, this program made me realize that I shouldn’t neglect the hearing aid. I’ve kept [the HA] in its box for a long time, but it’s no use keeping it there. Now I am using [the HA] practically every time I am around people. (P19)

However, a majority of the participants did not report increased HA-use, in terms of hours per day, rather they reported increased confidence in how to deploy new or revisited knowledge practically related to their everyday HA-use.

Yes, I do think [the program made a change in my HA-use]… I would say that I’m now using my hearing aids in a smarter way. (P1)

Before participating, I never asked somebody to repeat a question or acknowledged that I didn’t hear in a conversation… Now I have more courage to do that. (P4)

**Findings regarding future applications**

All but one of the participants would recommend the IAR program to other HA-users for the following reasons: the Internet enables the gathering of meaningful information in a practical way; the program may increase one’s awareness of the HL; the program offers an opportunity to discuss experiences with peers; and the Internet makes the program easily accessible and enables participation in accordance with personal circumstances (e.g. time and place). Many participants believed that the book may be of key importance to new HA-users. Several participants recommended the program especially for new HA-users, since it offers good information about HA technology.

I would do that [recommend the program]… especially for the new ones, the ones fitted with hearing aids for the first time; they should go through this program as it would give them an introduction to what hearing aids can and cannot do for them. (P13)

Regarding program improvement, some of the participants suggested, for example, that significant others should be included in the program, that the psychosocial aspects of HL should be addressed, and that the pressure on participants to complete the weekly assignments should be increased. Several participants also expressed a need to simplify the use of the technical parts of the program website.

I was very disappointed on the technicalities, [the IAR program] was hard to reach and to navigate/…/this should have been much easier than it was. (P19)

**Discussion**

The results of the analysed interviews based on the use of IAR program were separated into three main categories: general experiences associated with taking part in the program, knowledge obtained from the program and perceived impact of taking part in the program. The participants’ experiences of the program were overall positive. This finding is in line with the quantitative analyses of the data reported by Thorén et al. (2014) where same participants showed significant improvements in activity and participation on a group level. The opportunity to acquire new knowledge and/or revisit previously learned knowledge appeared to be a key factor for many of the participants when attempting to improve their communication skills in daily life. According to Lumer (2010), in order to accomplish a framework of knowledge, participants need to define what they want to achieve by employing the knowledge. In the present study, being knowledgeable about the HL helped the participants define their desired achievements.

Further on, the results of the current study show that participants expressed improved self-esteem after participating in the program, which in turn encouraged many of them to take actions that could improve their daily communication. Accordingly, the current study theme indicated that as clients became more knowledgeable about HL, their self-esteem increased, and in turn, so did their ability to deploy knowledge practically i.e. the theme requires both the knowledge and the achievements – one does not preclude the other. The current study theme could be linked to empowerment as a purpose of health related education, which is defined as to: “Provide a combination of knowledge, skills, and a heightened self-awareness regarding values and needs, so that patients can define and achieve their own goals” (Feste and Anderson 1995; p.140). The overall results of this study were in line with Backenroth and Ahlner (2000), who used in-depth interviews to discover that counselling interventions can increase participants’ awareness of the HL, help them gain new perspectives on wearing HAs, and boost their self-confidence. Further on, in Henshaw, McCormack, and Ferguson (2015), the increased awareness of hearing difficulties encouraged some participants to seek further interventions.

The improvement in self-esteem may have been linked to the improved psychosocial impacts associated with HA use. Many participants in the present study reported increased confidence in how to deploy new or revisited knowledge practically related to their everyday HA-use. According to Dawes, Maslin, and Munro (2014), getting used to HAs involves discovering what psychosocial impact HA-use will have on one’s self-esteem. Even though many participants in the current study were experienced HA-users, the positive effects of the IAR program led to increased self-esteem and to participants taking further action to improve their daily communication. This indicates that more purposeful HA-use may lead to more substantial everyday communication.

The discussion forum in the IAR program, the individual interaction with the audiologist and parts of the weekly assignments in the program could be considered examples of client-centered practice in AR. For example, participants were able to discuss social, psychosocial or environmental factors related to their own life experiences of HL, with each other in the discussion forum, or individually with an audiologist. Furthermore, for example, some of the weekly assignments required participants to describe real life experiences of communication failures and to address such shortfalls with communication strategies. Earlier research reveals some positive effects of intervention adherence when involving participants in a client-centered approach.
(Laplante-Lévesque, Hickson, and Worrall 2010; Grewness et al. 2014). However, the adherence to the discussion forum in the current study was reported as poor. One reason for poor adherence could be the technical difficulties experienced by the participants. As many participants reported benefits from reading the narratives of peers, another reason could be that, due to the positive effects obtained from reading other peers’ comments, the participants didn’t see the value of writing personal experiences. Exchanging experiences in an online discussion forum for HA-users has shown positive effects in previous research as well (Thorén et al. 2011). According to Laplante-Lévesque, Hickson, and Worrall (2010) other people’s experiences, recommendations and support is one of 7 factors influencing rehabilitation decisions. Exchanging experiences in the current study could be one of the positive impacts the IAR seem to have on participants’ ability to participate in decision-making with their audiologist regarding future interventions.

**Clinical implications**

Despite the positive effects of communication programs, many hearing aid users are neither aware of nor offered such programs (Kochkin 2009). In a study by Grewness et al. (2015), 62 initial AR consultations were filmed and analysed. The results indicated that the clinicians focussed mainly on hearing aid-related issues. In the current study, differences in expectations of the program could be sensed among the participants. This may be explained by clinicians generally not having time to bring up the importance of HA follow-up programs in connection with HA fittings. It could also be due to difficulties scheduling communication programs in addition to HA-fitting (Grewness et al. 2015). An Internet-based approach increases the availability of HA follow-up programs, and previous research has revealed the advantages of implementing IAR in general clinical practice (Malmberg et al. 2015).

Using the Internet to provide AR programs has been a positive experience in the current study, with the Internet making the program easily accessible. People with HL are more motivated than their hearing counterparts to use the Internet (Barak and Sadowsky 2008). Admittedly, the technical problems with the studied online program call for attention, as technical assistance was requested by many participants. This is in line with Brännström et al. (2016) and Thorén, Pedersen, and Jornaes (2016), who found that users of Internet-based programs/systems appreciate simplicity in the use of technology. Providers of future programs should take this into account. Another valuable consideration would be to include significant others in the program. Preminger and Rothpletz (2016) consider the inclusion of a communication partner to be one of four activities critical to a successful Internet-based group AR.

**Methodological limitations and future directions**

In the present study, the participants expressed expectations and motivation for participating. This could be described as internal motivation driving the participants to actively seek involvement in research (Hagger and Chatzisarantis 2008; Thorén et al. 2014), a characteristic that could affect the outcome of the program (for additional participant characteristics, see Thorén et al. 2014). A participant’s expectations prior to participation may influence the individual perceptions and understanding of an IAR program. Henshaw, McCormack, and Ferguson (2015) found that reasons such as hearing difficulties affected non-HA-users’ initial participation in a study on computer-based auditory training. In the present study, self-perceived hearing difficulties were one requirement for participation in the IAR program (see Thorén et al. 2014). According to Vestergaard Knudsen et al. (2010), self-perceived hearing difficulties correlate with elements such as HA use and satisfaction.

The interpretations in the current study should be viewed within the context of qualitative research (Malterud 2001). The results cannot be generalised to all HA-users who participate in an IAR program. Furthermore, the average duration of interviews appeared short, and also, the interviews took place six months post-participation in the program, and the participants’ experiences rely on what they remember from the program. This could certainly affect the results of the present study, and there is a need of more studies to be done.

**Conclusions**

This study examined an IAR program in terms of participant experiences, and provides some valuable information for developers of Internet-based interventions within AR. The results reveal overall positive experiences in relation to the studied IAR program. Identifying what was of greatest importance for the participants is a challenging task. Many participants gained knowledge from the program. These benefits led to participants experiencing increased awareness of the HL, HA benefits, and communication strategies, as well as improved self-esteem. The program underlines the ability of HA-users having confidence in how to deploy new or recognised knowledge practically, i.e. enhancing empowerment, and shows the participants what they can do rather than what they cannot do.

In conclusion, our recommendation for future efforts when developing and modifying Internet interventions is that theory and practice must go hand in hand. The information provided through an Internet intervention should be comprehensive and easy to follow, and include concrete applications. Another important recommendation is keeping the Internet-based program simple in the use of technology in order to facilitate usage of the program. Also, offering participants the possibility to share experiences with other people, to get recommendations and support are important outcome mediators that should be considered in future Internet interventions.

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