Analysing Digital Information Seeking and Quality Evaluation of Sources about Healthy Lifestyle among Senior Citizens in Iceland

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As a key to senior citizens health and well-being it is important to support their possibilities to be actively involved in health promotional interventions through life-long learning. The study aims at understanding better older people's digital information seeking, their source preferences and how they evaluate the quality of the information. An improved awareness of the issue may help to increase the efficiency of disseminating information to seniors and enhance their abilities to adopting healthier lifestyles. A random sample was used in the study and data collected in 2012. Participants were categorized into two groups, 60 to 67 years and 68 years or older. Data analysis was performed with ANOVA (one-way). The difference across the age groups was in most cases not significant. Both groups rarely sought digital information and considered the quality of it to be low. The results indicate that the older population can be reached with information about healthy living through professional health websites. Libraries and information professionals have the possibility and the means to take a leadership role and work together with health authorities at improving and stimulating senior's use of digital health information.

Keywords: *digital health information; healthy lifestyle; information reliability; information seeking; information usefulness; senior citizens; Iceland*

1. Introduction

The lifestyles that people practice are widely known to have impact on their health. Unhealthy behaviour patterns, for example smoking, unhealthy dietary habits and sedentary lifestyle, are associated with a number of health problems and mortal illnesses (Ford et al. 2012, Mackenbach 2006). Thus, it is of great significance to influence and empower people to change their behaviours into a healthier manner.

Approaches that aim at preventing disease, such as promoting healthy behaviours, have been shown to be successful at improving population health and well-being and to maintain sustainable health of the population (World Health Organization 2014). There is evidence suggesting that information seeking and lifelong learning is an effective way to promote public health. Seeking for health information has for example been related to the feeling of having a power to make positive health behaviour changes (Manafo&Wong 2015), as well as improvements in both health knowledge and healthy behaviour (Shim et al. 2006). Information seeking has, furthermore, been related to perceived better health. Weaver et al. (2010) found that internet users who sought information about health and wellness on the internet were more likely to consider themselves to be healthy and reported fewer health risk factors, than those who sought only for information about illness. Enwald et al. (2017), on the other hand, has reported that with growing age, seniors are more likely to have negative attitude towards information about physical exercise, avoid thinking about it and feel that the information is not motivating.

The paper will present results about Icelandic senior citizens information seeking and preference for information sources on the internet, as well as their evaluation of the quality of the information

found in the sources. Knowledge about this issue is important for libraries and information specialist who can work together with health authorities at improving older peoples possibilities at lifelong learning.

1.1 Literature review

It is a well-known fact that societies all over the world are ageing rapidly. From 2013 to 2050 it is expected that the number of people aged 60 years and older will more than double globally (United Nations 2013). In Western countries, the forecast is a little lower, with the proportion of senior citizens estimated to double, from 11% in 2006 to 22% in 2050 (World Health Organization 2007). This calls for awareness of how older people can be assisted at living independently in their homes. It is equally important to support their prospects to be active participants in society and thereby decrease the possibilities of their social exclusion. Inspiring older people to practice a healthy lifestyle in order to stay healthy for as long as possible is essential, for both the individuals and society, since it is likely to support and enhance their independence and social inclusion.

As a key to seniors' health and well-being, it is important to encourage them and support their possibilities to be actively involved in health promotional interventions through life-long learning. A prerequisite for this is that they must have an access to quality information that satisfy their needs. The need for information that is not demanding to access and which can easily be put to use has been stressed (Eriksson-Backa et al. 2012).

Health related information is increasingly being provided in a digital form, which can open up an opportunity for an easy access to it. It is also well known that older adults have adopted to information technology at a slower rate than those who are younger (Pálsdóttir 2009, Smith 2014). Senior citizens did not grow up with computers or the internet, and not all of them have had an opportunity to grow accustomed to using it while they were still active on the labour market. It has, nevertheless, been suggested that because those who are younger are more accustomed to using the internet in their work or private life, older people will gradually become more used to seeking information digitally and therefore more active users of the internet (Bromley 2004, Loos 2012). Accessing information on the internet is contingent on people having online access. However, other aspects should also be considered and various factors have been identified that can have an impact on senior citizens use of information technology.

Some of the concerns relating to the relatively slow adoption of seniors may include life course effects on the use of digital information. It has for example been noted that weak physical condition and health problems can cause challenges for a certain group of elderly people (Smith 2014). Communication barriers, such as problems with the visual and auditory presentation of information (Enwald et al. 2017), and changes in the motor ability which people can experience as they grow older (Hoogendam et al. 2014), can also affect the ability to use digital devices. By taking the needs of older people into account when information technology is designed, for example with suitable interface design and touch screen solutions (Piper et al. 2010), some of the obstacles that they are faced with might be minimised.

Concerns have also been raised that because of lack of practice at using the internet and negative beliefs related to the quality of the information found there, senior citizens may not benefit as much from it as others (Fischer et al. 2014). Studies have described a negative relationship between age and trust in health information on the internet. In a survey among people aged 50 years or older, those who were 65 years or older were found to be less likely to trust the internet as a source of health information than those who were younger (Zulman et al. 2011). Seniors have been found to regard health information on the internet to be both less reliable (Eriksson-Backa 2012, Pálsdóttir 2011) and less useful (Pálsdóttir 2011) than information from other sources or channels. Furthermore, it has been reported that trust is related to the use of health information on

the internet and that a negative relationship increases with age (Soederberg Miller&Bell 2012). Because information about healthy living are increasingly being delivered digitally, it can be considered a barrier when senior citizens tend to avoid it and prefer rather to use sources in other information channels. In fact, it has been noted that attitudinal issues have a bearing on the use of digital information and that mistrust reduces the use of it (Fischer et al. 2014), while if senior citizens consider the relevance of digital information to be high they are prone to make more effort at seeking it (Loos, 2012, Medlock et al. 2015).

It is of great importance that the needs, abilities and circumstances of older adults are not unseen and unrecognized, so that they can benefit from the development in information technology and the knowledge that can be gained from digital health information sources. As an information channel, the internet offers a wide variety of sources that people can choose between while seeking health information. Yet, studies often refer to the internet as one resource of information (Manafo&Wong 2015, Soederberg Miller&Bell 2012, Zulman et al. 2011), without distinguishing between the various sources that it contains. In addition, senior citizens are a heterogeneous group and by dividing them up in age groups it may be possible to distinguish differences or similarities among them .

1.2 Aim and research questions

The aim of the present study was to understand better older people's digital health and lifestyle information seeking, their source preferences, as well as how they evaluate the quality of the information found on the internet. Specifically the aim was to seek answers to the following research questions:

1. Which internet sources do senior citizens in the age groups 60 to 67 years old and 68 years or older prefer and to what extent do the seek information in the sources?
2. How do they evaluate the quality of the internet sources, with regard to the usefulness and reliability of the information found?

Relatively little is known about how older people prefer to use the internet to gain information and knowledge about healthy behaviour, as well as how they can be supported at it. Shedding more light on this issue might prove useful for libraries and information professionals who can take a leadership role at enhancing older people's possibilities to make use of digital health sources and thereby their opportunities for healthy living. Thus, the study findings may improve the understanding about seniors' preferences for digital health information and help to increase the efficiency of information dissemination for them.

2. Materials and methods

2.1 Data collection

Data were gathered in spring 2012 from two samples using an internet and a telephone survey of 600 people each. For the telephone survey, a sample representing the adult population in Iceland was used, consisting of 600 people from the whole country, aged 18 years and older and randomly selected from the National Register of Persons in Iceland. Participants were contacted by telephone and invited to answer the survey directly by telephone or by email. For the internet survey, a random sample of 600 people from the Social Science Research Institute at the University of Iceland net panel was used. The net panel consists of people aged 18 years or older from the whole country. A random sample from the National Register of Persons in Iceland was contacted by telephone and people were asked if they were willing to participate in the net panel. The choice of participants in the net panel follows strict methodological rules to avoid

convenience sampling. The net panel is updated regularly to ensure that it corresponds with the distribution in the population, regarding sex, age and residence.

Respondents consisted of 299 individuals belonging to the simple random sample drawn from the National Register who were reached by telephone and 399 participants in the net panel. Women were overrepresented in the telephone survey, with 57.2% of the respondents being women. However, of those who participated in the net panel survey, 50.9% were women and 49.1% were men. The age distribution of respondents from both samples was also different although not statistically significant. The respondents who answered the telephone survey (or provided their email addresses over the telephone) were slightly younger than the net panel respondents. While 20.4% of those answering the telephone survey were 18 to 29 years of age, the same held for 16.3% of those who belonged to the net panel. It can therefore be said that each data collection method has advantages and disadvantages. The net panel reaches both men and women but those who belong to the youngest age groups (18-29 and 30-39) were reluctant to answer surveys sent out to the net panel. By combining the datasets from these two surveys, the sex and age distribution was closer to the corresponding distribution in the population. Both datasets were therefore merged, allowing answers from all individuals belonging to each set of data. The total response rate was 58.4%.

The current paper focuses only on respondents who have reached the age of 60 years and older. In Western countries it has been traditional to use the retirement age to define "elderly" (Thane 1989), and in Iceland elderly is defined by law as people who have reached the age of 67 (Lög um málefni aldraða nr. 125/1999), when it is usual for people to retire. This has, however, been criticised for not taking into consideration the heterogeneity of older people (Berger 1994). It has been pointed out that people's chronological age is less important than determinants, like their physical, cognitive and social capabilities (Ries&Pöthiga 1984). In Iceland it is customary to use the term *senior citizens* for older adults and therefore it is used in this study. In accordance with the viewpoints, that there is no clearly defined age when people become senior citizens, the associations for senior citizens in Iceland admit those who have reached the age of 60 to become members (Landsamband eldri borgara s.a.).

However, classifying all seniors together in one age category may obscure differences among them, while comparing sub-groups can generate differences and similarities between them. In addition, as mentioned above it has been implied that although those who belong to the elderly generation today are reluctant to use digital information this may change with the coming elderly generation. Therefore it was decided that people who have reached the age of 60 should be included in the study, and to compare people at the age 60 to 67 years old, a group who is approaching retirement, with those who are 68 years or older, who have reached the retirement age.

A total of 176 people at the age 60 years and older participated in the study, 86 women and 90 men. Participants aged 60 to 67 years were 87, while 89 participants were 68 years or older (oldest participant was 92 years old).

2.2 Measurements and data analysis

The following measurements were used in the study:

(1) *Age groups*. Socio-demographic information included traditional background variables, however in the current analysis only the variable age is used. To better assess how the internet adoption may relate to age the participants were divided into two groups, those who are aged 60 to 67 years and those who are 68 years and older.
(2) *Information seeking.* This was examined by asking the participants': 'How often do you seek

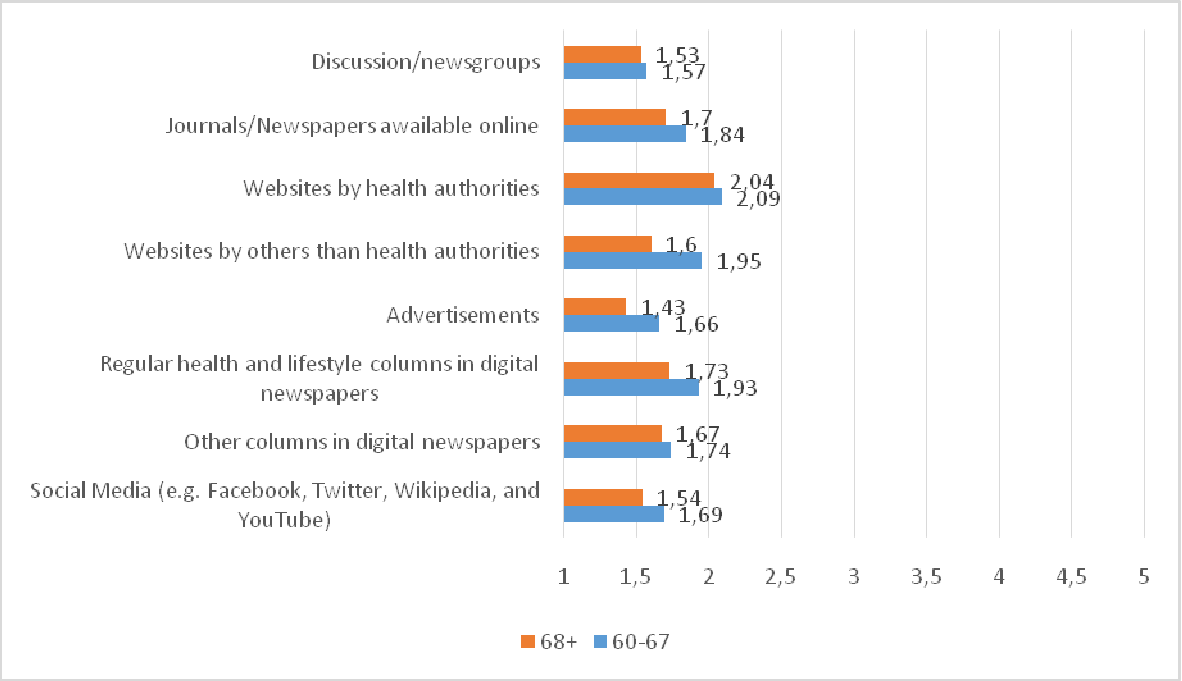
information about health and lifestyle in the following sources'? A list of eight information sources on the internet was presented and people asked to provide answers about every source. The questions had a five-point response scale (5: Very often, 4: Rather often, 3: Rather seldom, 2: Very seldom, 1: Never).

(3) *Quality of information*. This was examined by two questions: 'How useful do you find information about health and lifestyle in the following sources'? And 'How reliable do you find information about health and lifestyle in the following sources'? The same list of information sources was presented as for the question about information seeking. The questions had a five-point response scale (5: Very useful/reliable, 4: Rather useful/reliable, 3: Rather unuseful/ unreliable, 2: Very unuseful/unreliable, 1: Don't know).

ANOVA (one-way) was performed to examine difference across the age groups for information seeking activity, as well their evaluation of the information usefulness and reliability .

3. Results

The chapter will start by presenting results about information seeking in source on the internet by the participants in the two age groups. This will be followed by results about the evaluation of the usefulness of the information in the same sources and after that results about the evaluation of the reliability of the information in the sources.

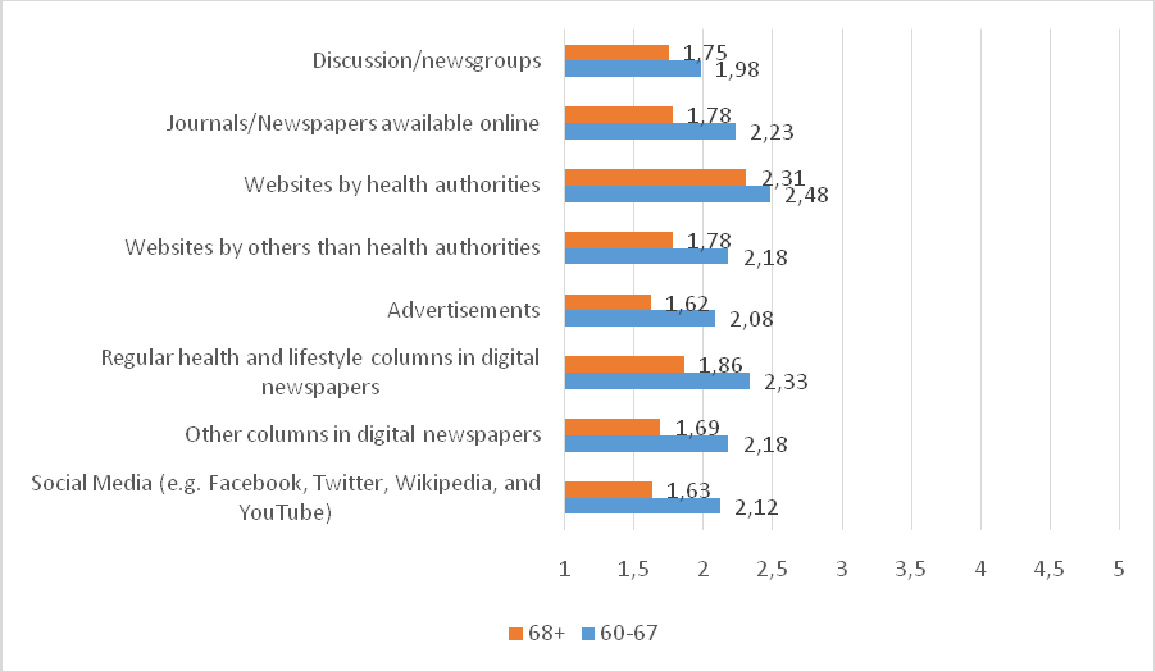


Mean scores, 1=Never, 5=Very often

Figure 1. *Information about health and lifestyle sought in sources on the internet*

As can be seen from Figure 1, both age groups sought information infrequently in sources on the internet. Apart from websites from health authorities, the mean score for all the sources is below 2 (Very seldom). Thus, the participants sought information in the internet sources either never or very seldom. Those who belong to the younger age group did though seek information more often than those who belong to the older group. However, the only significant difference across the age groups was for websites by other than health authorities, which the younger group used more frequently for information seeking than the older group $F(1,179=5,23; p=0,023)$.

The older group sought information about health and lifestyle least frequently in advertisements and after that in discussion/newsgroups and social media. The results about the younger group are similar, with information being least often sought in discussion/newsgroups and after that in advertisements and social media. Both age groups sought information most frequently in websites by health authorities. The age groups, however, differ in their use of websites by other than health authorities. This was the source that came as second for seeking information by the younger group, while the older group used it less frequently (Figure 1).



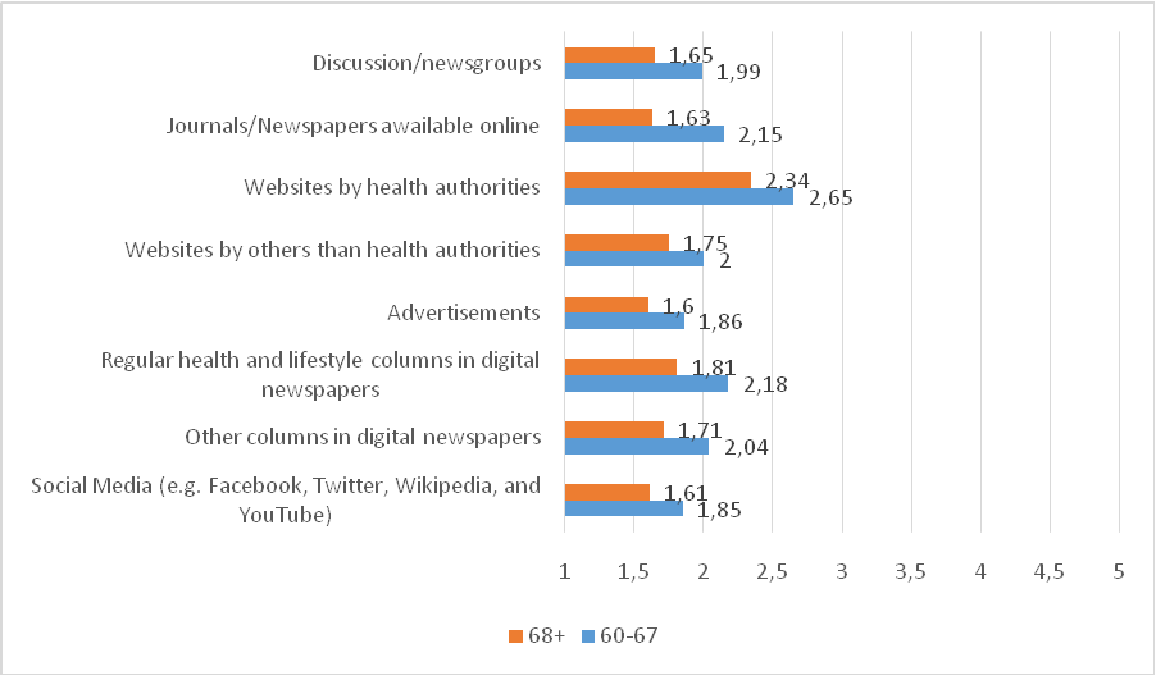
Mean scores, 1=Don't know, 5=Very useful

Figure 2. *Usefulness of information about health and lifestyle in sources on the internet*

Figure 2 shows that those who are at the age 60-67 years found information in all sources to be more useful than those who are 68 years or older.

Information on websites by health authorities were considered most useful. The mean scores for the age groups are similar and they did not differ significantly F(1,162=0,54; p=0,464). Information in regular health and lifestyle columns in digital newspapers were considered to be second most useful. However, those who belong to the younger group rated the information found there significantly higher than the older group, F(1,155=5,25; p=0,023). Likewise, the younger group found information in journals/newspapers available on the internet F(1,159=5,16; p=0,024), websites by others than health authorities F(1,161=4,24; p=0,041), advertisements F(1,159=6,68; p=0,011), other columns in digital newspapers F(1,160=6,97; p=0,009), and social media F (1,158=6,44; p=0,012), to be significantly more useful than those who belong to the older age group. For discussion/newsgroups F(1,163=1,44; p=0,232) significant difference was not found across the age groups (Figure 2).

Figure 3 shows results about how the seniors evaluate the reliability of information in the various sources.



Mean scores, 1=Don't know, 5=Very useful

Figure 3. *Reliability of information about health and lifestyle in sources on the internet*

As can be seen from Figure 3, participants who belong to the younger age group considered information in all the sources to be more reliable than those who are 68 years or older.

Both age groups found websites by health authorities to be most reliable. Although the mean scores show that those who are 60-67 years old considered it to be somewhat more reliable than those who are older, the difference across the age groups was not significant F(1,158=1,83; p=0,179).The younger group found regular health and lifestyle columns in digital newspapers to be the second most reliable source. This was followed very tightly by journals/newspapers available online. For the older age group, there difference in evaluation of sources other than websites by health authorities was relatively small (Figure 3).

Significant difference was only found across the age groups for discussion/newsgroups F (1,158=4,26; p=0,041) and journals/newspapers available online F(1,154=9,85; p=0,002). For websites by others than health authorities F(1,157=2,06; p=0,153), advertisements F(1,154=3,09; p=0,081), regular health and lifestyle columns in digital newspapers F(1,156=3,82; p=0,053), other columns in digital newspapers F(1,154=3,55; p=0,062), and social media F(1,154=2,17; p=0,142), no significant difference was found across the age groups (Figure 3).

4. Discussion

In the past years, the development in information and communication technology has drastically altered the possibilities to disseminate and access information about healthy lifestyle. It has meant that people's information environment is constantly changing, with information sources on the internet continually becoming more important as means for people to practice lifelong learning. This is a progress that can be expected to continue in the coming years.

Elderly people form the fastest growing population group in most parts of the world (United Nations 2013, World Health Organization 2007). It is of great significance for their well-being to

support them at taking an active part in health promotion and practice healthy behaviour. To do that they need to be able to add new understanding and skills to their already existing knowledge. Information about healthy lifestyle is increasingly provided digitally. Ensuring seniors access to quality information on the internet which they feel that they can trust, and to stimulate and enhance their digital health knowledge seeking, is therefore essential. Libraries and information professionals can make a significant contribution to this.

The study examined digital information seeking about healthy living and preferences for information sources on the internet among senior citizens at the age of 60 years and older. In addition, it explored the senior's evaluation of the quality of the sources, regarding the usability and reliability of the information found there. This was done by comparing two age groups of seniors, those who were 60 to 67 years old and those who were 68 years or older.

Online access is a prerequisite for retrieving information on the internet. In Iceland, internet access is widespread, with a total of 95% of Icelandic homes having access to it in 2012. The figures about internet use do, however, show that the frequency of it decreases with higher age. A total of 85.2% of men and 77.1% of women at the age of 55-75 years had connected to the internet daily, compared to 94.2% of men and 94.4% of women in the age group 25-54 years old (Statistics Iceland 2012). The same trend can be seen internationally, findings about internet usage in the U.S. show for example that age is negatively related to online health information seeking (Fox and Duggan, 2013). Nevertheless, the statistics from Iceland indicate that older people's prospects for accessing information on the internet are good.

The results from the present study, however, show that the frequency of using digital health information sources was very low. On a scale from 1 (never) to 5 (very often), the mean figures for information seeking ranged from 1.43 to 2.04 for those who were 68 years or older and 1.57 to 2.09 for those who were 60 to 67 years old. The seniors, therefore, either never used the internet sources for seeking information about health and lifestyle, or did so very seldom.

A comparison of the age groups revealed that both groups rarely sought information in sources on the internet. Both groups rarely seek information in sources on the internet. Those who are at the age 60 to 67 years sought information in all of the internet sources more often than those who are 68 years or older. However, apart from websites by other than health authorities, the difference across the age groups was not significant. The study also asked how the seniors evaluated the quality of the information in the internet sources. The results reflect the outcome about information seeking in terms of low rating of all the sources by both age groups. It was though interesting to note that the scores for the quality evaluation were in general somewhat higher than the mean scores for seeking information in the sources, a difference that was more distinct for the younger age group. For the evaluation of the usefulness of the information (1: Don't know - 5: Very useful) the mean scores for the older group ranged from 1.62 to 2.31 and 1.98 to 2.48 for the younger group. The mean figures for evaluation of the reliability of the information ranged from 1.60 to 2.34 for the older group and from 1.85 to 2.65 for the younger group. The younger group rated the usefulness of the information significantly higher than the older group in all sources, except for websites by other than health authorities and discussion/newsgroups. Whereas, results about the reliability of information revealed that, even though the mean figures were higher for the younger group than the older group, the only significant difference across them was for discussion/ newsgroups.

The internet source that was preferred most by both age groups was websites by health authorities. Both age groups reported that they sought information most often in it and that they considered the information to be most useful and most reliable. These results are partly in line with other findings. Previous studies have repeatedly reported health professionals to be the most trusted source of health information (Chaudhuri et al. 2013, Medlock et al. 2015, Pálsdóttir 2011). The results from

the present study indicate that this also applies to information provided by health professionals on the internet. Hence, in spite of the low use of internet sources, this finding may indicate that health professionals have an opportunity to reach the older population with information about healthy living through professional health websites.

The study asked about eight information sources on the internet. This is more extensive than what has been common in other studies and should therefore serve to provide a more detailed picture of the digital information behaviour of elderly people. Nevertheless, in light of the rapid changes that take place in information and communication technology, future studies need to develop the list of sources accordingly so that it reflects the digital information environment. It also needs to be kept in mind that the overall study is limited by a rather low response rate of 58.4%. Although, this is considered satisfactory in a survey it nevertheless raises the question, whether or not those who answered the survey are giving a biased picture of those who did not respond. However, the rate of people at the age of 60 years and older in the sample (27%) is higher than in the population (19%), which strengthens the findings. Thus, the study results may provide valuable information about senior citizens information seeking and how they experience trust in online sources about healthy living.

The ability to make effective use of the information environment to enhance knowledge throughout life is has been described as a basic human right of lifelong learning (The Prague declaration 2003). Information technology develops rapidly and it is important to realize that people may not always change their information behaviour in line with it. Particularly the older generation who has formed their habits of information seeking and attitude towards the quality of information sources during a lifetime. In addition, although it can be assumed that the coming generation of senior citizens will be more used to seeking information on the internet, the skills that they possess today may be irrelevant in the future. Thus, a question remains how they will be able to adapt and learn new technology. For that they may need assistance and support, which is a challenge that future studies need to seek answers to.

5. Conclusion

Promoting senior citizens possibilities to take active part in health promotional interventions, through life-long learning, is a crucial issue which may have impact on their wider prospects for sustainable health and wellbeing. As a key to that, it is essential that they have an easy access to information that they feel that they can trust and meets their needs. Information about healthy living is increasingly being provided digitally and it is of concern if older people do not have sufficient possibilities to benefit from it. The study sought to understand better how seniors can be supported with information about healthy lifestyle. This was done by comparing how seniors, in the age groups 60 to 67 years old and 68 years or older, sought information in eight sources on the internet, as well as their evaluation of the usefulness and reliability of the information.

The results of the study revealed the same pattern for information seeking behaviour and quality evaluation of the sources for the age groups. Both groups rarely sought information in the internet sources and considered the quality of it to be low. The scores for those who belong to the age group 60 to 67 were higher than for those who are 68 years or older but, except for the evaluation of the usefulness of the information, the difference was in most cases not significant. In addition, the information source that was most preferred by both age groups was websites by health authorities. It can, therefore, be concluded that these age groups have more in common than what separates them.

Furthermore, the results indicate that the older population can be reached with information about healthy living through professional health websites. An improved awareness of senior's information seeking, opinion and preferences for digital information sources, may help to increase

the efficiency of disseminating information and enhance their abilities to adopting healthier lifestyles. By providing seniors with high quality service libraries make can make a difference in this respect. Libraries and information professionals have the possibility and the means to take a leadership role and work together with health authorities at improving and stimulating seniors use of digital health information.

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