Online Health Information Seeking Behaviour of Working and Non-working Estonian Older Adults as Compared to Students

Marianne Paimre[a]
School of Digital Technology, Tallinn University, Narva Road 25, Tallinn, Estonia

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Abstract: This article focuses on online health information seeking behaviour (OHISB) of Estonian older adults who either continue or have stopped working after retirement. In order to shed light on the digital divide between generations their OHISB was compared to that of university students'. 30 interviews with seniors and 20 with university students were conducted followed by a think aloud protocol. The results of this study suggest that there might not be any major differences in OHISB between working pensioners, who due to the nature of their work have regular access to computers, and the young people. On the other hand, the working and non-working older adults may differ markedly in this respect. The fully retired seniors not using computers or other digital devices, cited lack of skills as the main reason for their inactivity. In order to successfully harness all the benefits of digital solutions, the economic situation and digital skills of the senior citizens in full-time retirement should be improved first. This article highlights the digital divide in that particular age cohort warranting further investigation.

1 INTRODUCTION

Today, people retrieve information on health and diseases mostly from the online environment (Dahl et al, 2018; Fox & Rainie 2014). In the more affluent societies, elderly people are the fastest-growing segment of Internet users and various IT health applications have been developed for them (Richardson et al, 2019; Wildenbos et al, 2019; Naszay et al, 2018). However, in poorer countries seniors are often referred to as being deprived of the benefits of digital society (König et al, 2018). Statistics reveal a large digital divide between generations especially in Eastern European countries, and within the elderly population itself (People in the EU, 2017).

In Estonia, heralded as the most successful digital country in the world (Hankewitz, 2019), healthy lifestyle apps have become increasingly popular among younger people. It has turned out that more than 70% of young people aged 16–24 had been looking for health information in the last 3 months (Statistics Estonia, 2017). At the same time, 40% of the 65–74-year-olds do not use the Internet at all (Statistics Estonia, 2019). Nevertheless, the ones that need information on health and diseases the most are seniors because of their failing health.

One of the features characteristics of Estonia, the former Soviet republic is that its ICT sector is known to be well advanced, yet the general standard of living lags behind the developed countries with one of the most conspicuous poverty rates among the older adults in Europe. Thus, it is no wonder that the gap between young and elderly people's use of ICT is in Estonia larger than in the Nordic countries (European Social Survey, 2019), because economic pressures can be one factor preventing seniors' access to ICT.

This article will focus on Estonia's elderly people's online health information seeking behaviour (OHISB). The primary concern for the author was whether and how employed older adults differ from their non-working peers in seeking health related information. In order to shed some light on the digital divide between generations, seniors' OHISB is compared to that of university students.

Health information seeking behaviour in general means how individuals seek information about their health, risks, illnesses, and health-protective

[a] https://orcid.org/0000-0002-7079-6513

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behaviours (Lambert & Loiselle, 2007; Jakobs et al, 2016; Mills & Todorova, 2016) referring also to a series interaction diminishing uncertainty with respect to health status (Tardy & Hale, 1998). OHISB is usually understood as information seeking in online environment (Risk & Petersen, 2002).

Internet usage is associated with quality of life and well-being for the elderly people (Tennant et al, 2015). This can be also a significant tool for supporting the senior citizens to avoid social isolation and when solving issues associated with living arrangements and seeking information related to health (Rich et al, 2019). On the contrary, poor access to ICT resource and insufficient digital skills can lead to detachment from digital health resources, delayed diagnoses, increased rates of hospitalization and poor health outcomes and increased morbidity and mortality (Berkman et al, 2011). Internet, as an information source on health-related topics, is much appreciated because searches can be conducted subject to specific criteria e.g. particular symptoms or illnesses. Print papers and magazines, although a medium most favoured by older people, are expensive and therefore not frequently bought or subscribed to.

It is also paramount to study elderly people's OHISB to make modern healthcare systems more effective and to develop even smarter applications in the years to come. As the health of the older people in Estonia tends to be poor, old-age pensions are on the small side and the health care system overburdened, various online health resources and IT applications could be of considerable assistance to the senior citizens.

The rest of the article is organized so that the following section will provide an overview of the previous studies on older adults' OHISB. Thereafter a description of the methods used in this study will be introduced followed by the main results of the interviews and conclusions.

2 LITERATURE REVIEW

Research on older adults' ICT use often highlights digital divide between generations (Din et al, 2019; König et al, 2018; Brandtzæg et al, 2011; Xie & Bugg, 2009; Korupp, & Szydlik, 2005; Compaine, 2001). Several studies have demonstrated that elderly people often lack of technical and internet search skills and are reluctant to use computers for medical purposes (Wu and Li, 2016; Niemelä, Huotari, and Kortelainen, 2012).

Previous studies have also found that the elderly people obtain health information from social networks, such as healthcare providers, family members and friends, and less from information systems, such as the Internet, broadcasts, and television (Pálsdóttir 2012). Research indicates that the elderly has greater trust in those with whom they can discuss their health actively as opposed to non-living sources such as the Internet (Chaudhuri et al, 2013). Seniors' most frequently search for health information after an appointment with a doctor (Medlock et al, 2015).

Education and familiarity with Internet searching affect significantly task performance. Health, Internet search experience, and information credibility influence decisions to seek for information online. Better education is associated with greater e-health literacy. Females and those highly educated, report greater use of Web 2.0 for health information (Tennant et al, 2015).

Some researchers have examined behavioural features of query formulation, search strategies, and results evaluations (Huang et al, 2012). Rockmann and Gevald found that computer self-efficacy (CSE) and outcome expectations regarding internet-based health information act as primary determinants of individual's intention to use eHealth offerings (Rockmann and Gevald, 2015).

Erikkson-Backa and her colleagues in Finland examined older Finnish adults' self-perceived capability to access, evaluate, understand and use health related information and their perceived ability to influence their health themselves, and the relationship between these factors and their current health, health behaviour and information seeking (Erikkson-Backa et al, 2018). Results showed that both a stronger belief in one's capability to master health information and to act in a healthy manner were positively linked to better health and health behaviour as well as more active information behaviour.

Studies on health information needs reveal older adults' interest in special diseases, diagnoses, treatments, drugs, healthcare, and health policies, but also their changed need over time along with changes in their health conditions (Washington et al, 2011; Xie et al, 2010; Torp et al, 2008). There are also indications that eHealth skills differ strongly among the elderly people's cohort (Medlock et al, 2015). For example, Broekhus and her colleagues (2019) emphasized the need for more in-depth analysis of how age-related barriers influence the user acceptance of eHealth. They studied how age differences affect usability evaluations in eHealth and

found that the 55–64 age group encountered significantly fewer usability issues compared to the 65+ age group.

According to Lam and her colleagues (2016), existing research investigating students' e-health behaviour comes mainly from the medical and nursing area (Edirippulige et al, 2008; Hercigonja-Szekeres, Ilakovac, & Šolić, 2012; Clark, Baker, & Baker, 2009), and thus, research on OHISB of youngsters conducted in the fields of social sciences and information technology is highly welcomed (e.g. Lam et al, 2016).

It could be supposed that as young people are usually very fond of ICT, they are also competent in information seeking. However, some scholars refer to their lack of competences in retrieving health information. For example, Clark and his co-authors (2009) found that adolescents often lack knowledge in e-health (Clark et al, 2009).

Using a cross-sectional study design of 420 undergraduate and postgraduate students participated in an online survey in Australia, they explored students' understanding of and attitude towards eHealth, frequency of online activities and soft-ware usage, confidence learning and using ICTs, and perceived learning needs. They found that, although students reported regular use of ICT, their understanding of eHealth was uncertain or limited (Lam et al, 2016).

Zhang (2012) explored college students' use of social networking sites (SNS) for health and wellness information and their perceptions of this use. He found that using social networking sites for health and wellness information was not a popular behaviour among college students. Participants were also sceptical about the quality of information, concerned about the lack of medical knowledge of their friends or peers and wary about possible social risks and invasion of privacy. He concluded that SNS-s seem not to be a well-perceived platform for health and wellness information.

Thus, based on earlier research it is evident that older people often face difficulties in using a computer and, also finding relevant online health information. However, the elderly is not a monolithic group regarding Internet use, but some are more familiar with ICT than the others. For young people, on the other hand, searching for information about health and illnesses is not a very popular activity. At the same time, also they may face problems finding the relevant information.

3 SAMPLE AND METHODS

In this study, in-depth interviews were applied to reveal seniors' and students' OHISB complemented by 'think-aloud' method. The latter enabled to assess the search logic employed by the users when answering questions proposed by the researcher.

All together 50 interviews were carried out. Thirty interviews were conducted with seniors who either continue (15) or have stopped working after retirement (15) were conducted. Also, twenty interviews with students of the University of Tartu (13) and Tallinn University (7) were carried out.

First, five interviews with elderly people attending various courses at a day center, but not working any more, were conducted in May 2018. These seniors (all 65+) of which four were females and one male regularly participated in an arts and crafts class and a sports club for seniors. One person had graduated from the university, two had post-secondary non-tertiary education, the other two had upper secondary education. More five interviews with seniors (65+) in full retirement in another centre were conducted in the beginning of 2020. Three of them had upper secondary and two higher education. Two older people (80+) claimed to be suffering from certain chronic illnesses. Others claimed to be in good health.

Also, five non-working seniors were questioned who responded to the calls to participate in the study published in *Maaleht* newspaper (Rural Paper) in December 2019. [1] Only six unemployed persons responded, one (claiming not to have access to the Internet) was excluded. All the informants were older than 65.

In addition, all together 10 interviews with employed older adults were conducted at the above-mentioned universities. Five of them were members of the administrative staff (all female) and five belonged to the teaching staff (2 male and 3 female). Five employed seniors were included later after the above-mentioned call was published (all female). Three of them worked in some hospital (1 GP, 1 specialist, and 1 secretary). The rest were officials (2). According to the interviewees, they were in good health considering their age (65+).

[1] https://maaleht.delfi.ee/uudised/osale-uuringus-kuidas-voiks-arvuti-meie-tervise-eest-rohkem-hoolitseda?id=88247385

With respect to students, first, three Tallinn University students were interviewed in autumn 2018 and four in 2019. In autumn 2019, 13 interviews were also carried out with students at the University of Tartu. All the interviews were recorded with a voice recorder and processed thematically (based on the aspects listed below) on a computer by the MAXQDA software.

The following aspects were touched upon: 1) whether and how often they claim to use modern information technology for seeking information on health and diseases; 2) what are the main reasons to use/not to use Internet for medical purposes; 3) what kind of information they seek for, and 4) what are the preferred sources and how they value/trust them.

Subsequently, the OHISB of voluntary four students and four seniors were examined in more detail. The respondents were asked to perform three tasks on the computer. Two of them were about finding an answer to a question regarding specific diseases (what is listeriosis and how to avoid it and what is vitiligo and how to treat it). The last question was related to establishing a diagnosis with the help of a computer (if you experience ringing in your ears, then what could that be and what should be done). The participants were asked to think out loud while solving a problem what was recorded by the researcher. This provided more objective information on digital skills in addition to self-reporting

Thus, as part of the initial stage, the study set out to establish how the elderly and students themselves comment on their OHISB, digital skills and trust in information sources. During the second stage, the information behaviour of the respondents was assessed by asking them to solve a number of health-related problems on the computer.

4 FINDINGS AND OUTCOMES

The interviews revealed different patterns in health information seeking between the elderly persons who continue working and those in full-time retirement. Those who were working reported significant interest in online information seeking and frequent information retrieving on health and diseases.

Ten out of fifteen working older adults in this study reported searching for health information every week. As they often use computers anyway because of their work, they also look up information on health conditions as well on healthy lifestyles. The university employees claimed to read health articles regularly from the newspapers' and magazines' online editions. A lady (65) noted:

> "If you sit behind the computer all day long then you inevitably also read the news, and if you come across a fascinating piece about medicine you just keep on reading."

They claimed to search actively for the medical information by googling, but they also visit special websites dedicated to diseases (e.g., www.inimene.ee, kasvaja.net) or Estonian dental care portal www.hambaarst.ee. Another lady (62) from the other university said:

> "Sometimes you might think that oh, I'm not feeling too good and wish to learn more about a possible condition that either you or someone close to you might have. Then I start to Google. Or simply go directly to some health-related web-page I know."

Especially seniors working in hospitals claimed to prefer certain special web-sites (medical news portal www.mu.ww, health counselling environment www.kliinik.ee, National Institute for Health Development www.tai.ee etc). They pointed out their source-criticism. On the other hand, two university officials who did not have a higher education claimed to use health information of varying degrees – even an alternative online paper Telegram was considered as a trustworthy information source. Officials and university employees said to prefer rather online newspapers' health sections, e.g. tervis.postimees.ee or health page of popular news-portal Delfi.ee www.delfi.ee/teemalehed/tervis.

On the contrary, the interviews with seniors in full-time retirement reported lack of access to the Internet and smart devices, thus they have almost no means of accessing digital health information. Several non-working pensioners reported a heightened interest in health issues but admitted that they do not know how to use a computer in order to conduct relevant online searches. For instance, a fully retired 75-year-old lady complained:

> "I am actually interested in all these health issues and digital solutions. However, there is a big 'but' – I don't know how to use a computer. My girlfriends are the same, none of us knows how. Nobody has taught us. I don't even have a smartphone. I suppose we could even afford one as we are all drawing a pension. But what's the use in buying it if you do not know how to operate it … We need proper training, special courses!"

Another non-working lady (76) claiming to get the relevant health information from especially from a popular rural newspaper *Maaleht*, also expressed desire to use online information, but reported lack of skills in using ICT.

On the contrary, some seniors, especially older ones (80+), were resolute in saying that they are not into modern ICT at all.

> ”Oh, you know, it’s a young people’s thing. I have absolutely no interest in this. So far, I have managed just fine without any computers and cell phones. What can they do for me? If I need health information, I’ll ask my doctor.”

Contrary to study conducted by Zhang (2012), which suggests that young people are not too keen on searching for health information online, the results of this study reveal considerable interest in health matters among university students. To illustrate this, a 23-year old MA student disclosed:

> ”It of course depends on the week. Sometimes, when I suspect I have contracted something, then I am constantly looking for more information on it. And then a week goes by without any online activity on health-related matters. If I need information, then I’ll first turn to Estonian language sites, for example inimene.ee, kliinik.ee. However, there are also some sites in English that I visit relatively often.”

Female students were more inclined to look up health information – all of them had searched for something on health at least twice over the past week.

It would only be reasonable to assume that young people are more interested in disease prevention aspects (e.g. how to remain healthy, how to retain or obtain healthy weight, which physical exercises are most efficient, etc), yet according to them, they pay more attention to descriptions of various symptoms and treatment recommendations.

Forum posts were also regarded as useful sources of information by students. Other people’s stories and experiences were deemed valuable in making health decisions, e.g. which doctor to see, etc. A female MA student added:

> ”I often read posts left by others because their experiences fascinate me. /---/. For example, I had a tooth problem just recently, so I had mu root canal done, but it got worse. Then I immediately checked if and what others have posted about it in forums.”

Finding a good doctor is apparently also high on young people’s agenda. A female student of Tallinn University declared:

> ”I originally come from Rakvere (a small town in Estonia) and I am currently looking for a family doctor in Tallinn. I am honestly rather confused about who to pick. Luckily, every year the biggest Estonian daily newspaper *Postimees* ranks the best GP practices in Estonia. However, the list is not complete, and you might not even get an appointment with the top ones, this is why I also try to see what’s being said about different doctors in forums – who is being commended or criticized on tervisetrend.ee.”

Two students had supplied user-generated content: the first one had commented on a health issue in one of the forums, the other had contributed to a Facebook thread on vaccination in response to the publication of a relevant article. Neither of them had initiated any topics/discussions in online communities or platforms. On the contrary, seniors had neither generated nor distributed any health-related online content on their own.

Young people noted that they only read content that originates from a reliable online source. According to them, the list of websites offering reliable health information includes hospitals (kliinikum.ee), public research institutes, e.g. the National Institute for Health Development (tai.ee) and specialists (derma.ee) that show up on the first page of Google. They were convinced that the search results displayed by Google first were actually worth reading. Yet, they admitted that some material which might seem interesting enough to read (e.g. forums and alternative media sources) and maybe even ranked high on Google should be taken with a grain of salt. However, in case of conflicting opinions – the official source says one thing, but it is second-guessed in forums – then the authors of forum posts tend to prevail in this dispute. A 30-year-old historian, is a good case in point:

> ”For instance, if I have a medical problem then I always consult with forums first to see what other people are saying about it. If discrepancies exist between the information published by some official site and forum, then I believe the latter, i.e., forum post.”

Conversely, the elderly place their trust in official sites as opposed to forums. They preferred official sources and newspaper online versions next to Wikipedia.

While the employed seniors themselves did not think too highly of their digital skills (only 4 in 15 were content with their IT skills), then the results of the actual tasks given to them revealed that seniors did not perform less well than the young. Moreover, seniors who often used computers were able to find the correct diagnosis corresponding to the original description provided by the researcher faster and more efficiently. This could be explained by the fact that in the course of their longer lives they have had to look up various conditions on the Internet, i.e., they have had more practice. But it could also result from the fact that seniors working at the university, in the

hospital or public services are simply better information seekers than students as they use more accurate search words or more relevant sources for their queries as well as resort to more efficient search strategies (e.g. when googling for the answer they were quick to find the website of the Health Board or some health information site where Estonian language articles are presented in a concise manner together with the necessary explanations).

To illustrate this further, when trying to learn about listeriosis and how to avoid it, some students immediately started searching for this information in foreign language scientific articles or student papers stored in digital libraries to retrieve some useful references, yet it would have been much faster to get the correct answer by visiting the websites of the Health Board or Tartu University Hospital.

In summary, both the elderly and young people were very interested in the health issues. It was somewhat surprising that students often claimed to be searching for diseases. Elderly people with higher education and still working seemed to be the most source critical. Unlike the elderly, young people often sought health information in forums and sometimes share health related content on social network sites. Several senior citizens claimed not to use computers were actually very interested to search health information online. They complained about lack of skills.

It is important to keep in mind that the elderly have very different online behaviours and digital competencies when developing health applications.

5 CONCLUSIONS

The study revealed great differences in OHISB between working older adults and those in full retirement. If a person uses a computer at work every day, then he/she is also more inclined to look up and obtain health information online. Two thirds of employed seniors claimed to search for health-related information every week. They both passively consume medical news from the newspapers and health magazines online editions and actively search special medical information websites. Often concern about one's health is a driving force for information seeking. Employed older adults also highly valued their information-seeking skills.

On the contrary, interviewees not working any more replied that they made very little use of the Internet. They did not regard online information as reliable and claimed to get almost all the essential health and disease-related information from the so-called live sources, e.g. mostly from their medical doctors or newspapers' health pages. However, several non-working pensioners claimed that they would like to use IT and would even have the necessary means to purchase a computer or some similar device, but nobody had taught them how to use such gadgets. Others, especially the oldest respondents, also referred to lack of interest.

Young people's interest in disease and health information proved to be much greater than originally anticipated. The elderly employees could be distinguished from students mainly in respect of not actively generating and sharing health content on the Internet. In contrast to the results of some studies conducted abroad (e.g. Zhang 2012), it can be said that for Estonian youth online has become a kind of leisure activity.

When developing digital applications, the disparities in readiness to use ICT among the older demographic in Estonia should not be overlooked. However, some of them cope equally well with the young and are actively seeking health information from online sources. Others lack any experience with computers and smartphones although they would like to use them. The third group is simply not interested in digital technologies.

As many non-users in Estonia also belong to the 55–65 age bracket, training programmes designed for people 55+ should be launched as a matter of urgency.

As the sample was too small, the study did not allow to analyse the impact of various background factors (e.g., family status, occupation, education) on OHISB. One of the shortcomings of the study lies in the fact that the sample failed to include any seniors working in positions where performance of their duties does not involve regular use of computers.

This qualitative research serves as an introduction to a more comprehensive survey which will collect data regarding OHISB and online health literacy among Estonian older adults (55+) as well as their aptitude for various applications. This allows for an identification of distinct older adults' profiles in their OHISB and a better grasp of their needs/difficulties in using e-health.

REFERENCES

Anker, A.E., Reinhart, A.M. & Feeley, T.H. 2011. Health information seeking: A review of measures and methods. *Patient Education and Counselling*, 82(3), 346–354. https://doi.org/10.1016/j.pec.2010.12.008

Berkman, N.D, Sheridan, S.L, Donahue, K.E., Halpern, D.J. & Crotty, K.2011. Low health literacy and health outcomes: an updated systematic review. *Ann Intern Med.* 2011 Jul 19; 155(2):97–107. doi: 10.7326/0003-4819-155-2-201107190-00005

Brandtzæg, P.B, Heim, J & Karahasanović, A. 2011. Understanding the new digital divide – a typology of internet users in Europe. *International Journal of Human-Computer Studies,* 69: 123–138. https:// doi.org/10.1016/j.ijhc s.2010.11.004

Broekhus, M., van Velsen, L., ter Stal, S., Weldink, J. & Tabak, M. 2019. Why My Grandfather Finds Difficulty in using E-health: Differences in Usability Evaluations between Older Age Groups. In Proceedings of the 5th International Conference on Information and Communication Technologies for Ageing Well and e-Health, 1 (ICT4AWE), 48–57, 2019, Heraklion, Crete, Greece.

Chancellor of Justice. 2018. Statistics Estonia should collect data on Internet usage by the elderly. https://www.oiguskantsler.ee/en/statistics-estoniashould-collect-data-internet-usage-elderly

Clark, J., Baker, B., & Baker, D. 2009. Getting eHealth into basic nursing education: Report of the RCN information in nursing project. *Studies in Health Technology and Informatics, 146,* 534–539.

Chaudhuri, S., Le, T., White, C., Thompson, H. & Demiris, G. 2013. Examining Health Information–Seeking Behaviors of Older Adults. *Computers, Information, Nursing,* 31 (11): 547–553. DOI:10.1097/ 01.NCN.0000432131.92020.42

Compaine, B.M. 2001. *The digital divide: facing a crisis or creating a myth?* Cambridge: MIT.

Dahl, A. J., Peltier, J.W. & Milne, G.R. 2018. Development of a Value Co-Creation Wellness Model: The Role of Physicians and Digital Information Seeking on Health Behaviors and Health Outcomes. *Journal of Consumer Affairs,* 52(3), 562–594. DOI: 10.1111/joca.12176

Din, H.N, McDaniels-Davidson, C., Nodora, J. & Madana, H. 2019. Profiles of a Health Information–Seeking Population and the Current Digital Divide: Cross-Sectional Analysis of the 2015–2016 California Health Interview Survey. *Journal of Medical Internet Resources*, May 14; 21(5):e11931. DOI: 10.2196/11931

E-Estonia. 2015. Estonian Foreign Ministry and Enterprise Estonia. [Website]. Accessed October 2, 2018. https://eestonia.com/.

Edirippulige, S., Smith, A., Beattie, H., Davies, E., & Wootton, R. 2008. Pre-registration nurses: An investigation of knowledge, experience and comprehension of e-health. *Australian Journal of Advanced Nursing*, *25*(2), 78–83.

Eriksson-Backa, K, Enwald, H., Hirvonen, N. & Huvila, I. 2018. Health information seeking, beliefs about abilities, and health behaviour among Finnish seniors. *Journal of Librarianship and Information Science* 50(3), 284–295. https://doi.org/10.1177/ 0961000618769971

Euopean Social Surevey. 2019. Round 9 (2018/2019). https://www.europeansocialsurvey.org/data/download.html?r=9

Fox, S. & Rainie, L. 2014. *The Web at 25 in the US.* https://www.pewresearch.org/wp-content/uploads/ sites/9/2014/02/PIP_25th-anniversary-of-the-Web_0227141.pdf

Hankewitz, S. 2019. Estonia declared the best country for digital life. *Estonianworld.com*. 30 May. https:// estonianworld.com/technology/estonia-declared-the-best-country-for-digital-life/

Hercigonja-Szekeres, M., Ilakovac, V. & Šolić, K. 2012. Medical students and e-health. In J. Mantas, S K. Andersen, M. C. Mazzoleni, B. Blobel, S. Quaglini, & A. Moen. *Studies in health technology and informatics, Volume 180* (pp.1150–1152). DOI: 10.3233/978-1-61499-101-4-1150

Huang, M., Hansen, D. & Xie, B. 2012. Older adults' online health information seeking behavior. In J. -E. Mai (Ed.), *Proceedings of the 2012 iConference*, Toronto, Ontario, Canada, February 7–10: 338–345. Accessed September 10, 2019. https://dl.acm.org/citation.cfm?id=2132220

König, R., Seifert, A. & Doh, M. 2018. Internet use among older Europeans: an analysis based on SHARE data. *Universal Access in the Information Society* 17: 621–633.

Korupp, Sylvia E., & Szydlik, M. 2005. Causes and trends of the digital divide. *European Sociological Review,* 21(4): 409–422, https://doi.org/10.1093/esr/jci030

Lam, M. et al. 2016. Preparedness for eHealth: Health Sciences Students' Knowledge, Skills, and Confidence. *Journal of Information Technology Education: Research, 15* Volume 15, 305–334 https://doi.org/ 10.28945/3523

Lambert, S., & Loiselle, C. 2007. Health information seeking behavior. *Qualitative Health Research, 17*,1006–1019. DOI: 10.1177/1049732307305199

Medlock, S., Eslami, S., Askari, M., Arts, D.L, Sent, D, de Rooij, S.E. & Abu-Hann,a A. 2015. Health information-seeking behavior of seniors who use the Internet: a survey. J Med Internet Res, 8, 17(1):e10. doi: 10.2196/jmir.3749.

Mills, A., & Todorova, N. 2016. An integrated perspective on factors influencing online health-information seeking behaviours. *Australasian Conference on Information Systems*, 4, 6.

Naszay, M., Stockinger, A., Jungwirth, D. & Haluza, D. 2018. Digital age and the Public eHealth perspective: Prevailing health app use among Austrian Internet users. Informatics for Health & Social Care, 43(4), 390–400. DOI: 10.1080/17538157.2017.1399131

Niemelä, R., Huotari, M. & Kortelainen, T. 2012. Enactment and use of information and the media among older adults. *Library & Information Science Research*, 34: 212–219.

Oh, Y. S., Choi, E.Y. & Kim, Y.S. 2018. Predictors of Smartphone Uses for Health Information Seeking in the Korean Elderly. Social Work in Public Health, 33(1): 43-54. DOI: 10.1080/19371918.2017.1391150

Pálsdóttir, Á. 2012. Elderly Peoples' Information Behaviour: Accepting Support from Relatives. *Libri.* 62(2), 135–144. DOI: https://doi.org/10.1515/libri-2012-0010

People in the EU – statistics on an ageing society. 2017. Accessed November 2, 2019. https://ec.europa.eu/eurostat/statistics-explained/index.php/People_in_the_EU_-_statistics_on_an_ageing_society#Senior_citizens_online_.E2.80.94_silver_surfers

Rich, E., Miah, A. & Lewis, S. 2019. Is digital health care more equitable? The framing of health inequalities within England's digital health policy 2010–2017. *Sociology of Health & Illness,* 41, 31–49. DOI: 10.1089/omi.2019.0069

Richardson et al. 2019. A Clinical Decision Support System based on an Unobtrusive Mobile App Ariella Richardson1, Avigail Perl, Sapir Natan and Gil Segev. Lev Academic Center, Jerusalem, Israel. BGSegev Ltd. (segevlabs.org), Jerusalem, Israel.

Risk, A. & Petersen, C. 2002. Health Information on the Internet. *JAMA*. 287 (20), 2713–2715. doi:10.1001/jama.287.20.2713. PMID 12020308.

Rockmann, R. & Gewald, H. 2015. Elderly People in eHEalth: Who Are They? Procedia Computer Science, 63, 505–510. https://www.sciencedirect.com/science/article/pii/S1877050915025119

Statisics Estonia. 2017. Noored IT-seadmete ja interneti maailmas. https://blog.stat.ee/2017/10/26/noored-it-seadmete-ja-interneti-maailmas/?fbclid=IwAR3tZ3saiApdZ_HqWkNnsx2R5uP7KYVKTz_OuAUNcK4Hg2dJe8vmkgU3uOQ

Statistics Estonia. 2019. Statistika andmebaas: *Sotsiaalelu. 16–74-aastased internetikasutajad elukoha ja kasutuseesmärgi järgi.* (Statistical database: *Social life. Internet users aged 16–74 by residence and purpose of use*.) Accessed October 4, 2019. http://pub.stat.ee/px-web.2001/Dialog/varval.asp?ma=IT38&ti=16%2D74%2DAASTASED+INTERNETIKASUTAJAD+ELUKOHA+JA+KASUTUSEESM%C4RGI+J%C4RGI&path=../Database/Majandus/05Infotehnoloogia/04Infotehnoloogia_leibkonnas/&lang=2

Zhang, Y. 2012. College Students' Uses and Perceptions of Social Networking Sites for Health and Wellness. *Information Research: An International Electronic Journal,* v17 n3 Sep 2012. https://eric.ed.gov/?id=EJ984785

Tambaum, T. 2017. Teenaged Internet tutors' use of scaffolding with older learners. *Journal of Adult and Continuing Education* 23 (1): 97–118.

Tardy, R.W. & Hale, C.L. 1998. Getting "plugged in": A network analysis of health-information seeking among "stay-at-home moms". Communication Monographs. 65 (4): 336–357. DOI: 10.1080/03637759809376457

Tennant, B. et al. 2015. EHealth literacy and Web 2.0 health information seeking behaviors among baby boomers and older adults. *Journal of Medical Internet Research*, 17(3), e70.

Torp, S., E. Hanson, E. S. Hauge, I. Ulstein, and L. Magnusson. 2008. A pilot study of how information and communication technology may contribute to health promotion among elderly spousal careers in Norway. *Health & Social Care in the Community*,16(1), 75–85.

Washington, K.T. et al. 2011. Information needs of informal caregivers of older adults with chronic health conditions. *Patient Education and Counseling*, 83(1), 37–44. https://doi.org/10.1016/j.pec.2010.04.017

Wildenbos, G.A, Jaspers, M.W., Schijven, M.P. & L.W. Dusseljee-Peute. 2019. Mobile health for older adult patients: using an aging barriers framework to classify usability problems. *International Journal of Medical* Informatics 124: 68–77.

Wu, D. & Li, Y. 2016. Online health information seeking behaviors among Chinese elderly. Library & Information Science Research 38 (2016) 272–279. http://dx.doi.org/10.1016/j.lisr.2016.08.011

Xie, B. & Bugg, J.M. 2009. Public library computer training for older adults to access high-quality Internet health information. *Library & Information Science Research*, 31, 155–162.

Xie, B., Wang, M., Feldman, R. & Zhou, L. 2010. Health information and decision-making preferences in the internet age: A pilot study using the health information wants (HIW) questionnaire. *ACM International Conference on Health Informatics*, 1, 610–619.