Master's thesis

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Digital skills and the use of m-Health to communicate with health professionals among deaf adults in Norway and Turkey

An exploratory cross-sectional comparative study

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Abstract

Background: Over the past years, information and communication technology (ICT) has become an essential part of daily life and industry worldwide, including health care. The development of digital health service systems, and particularly m-Health, have increased access to health care services. Deaf people face difficulties when approaching health care services, and e- and m-Health can empower deaf people by having increased control over their health. However, previous studies have not explored if deaf people have the digital skills necessary to use such devices.

Design and methods: This exploratory cross-sectional comparative study explored digital skills and the use of m-Health to communicate with health care providers among deaf adults in Norway and Turkey with a questionnaire. People between the ages of 18-64 with sign language as primary language were recruited in deaf organizations in Stavanger, Trondheim, and Antalya. The participants received a questionnaire that included sociodemographic and deaf-related variables and variables related to ICT usage and m-Health usage. The self-reported experience in digital skills was indexed into a total ICT-score, and the participants were categorized into levels of ICT-users. Descriptive statistics and cross tabulations were used to describe sample differences. Mann Whitney U-test was used to test differences in ICT-score. Regression analysis was used to analyze digital skills among the groups, and logistic regression analysis was performed to assess associations between ICT-scores and the use of m-Health applications. Participants' characteristics and country were controlled for in the adjusted analysis.

Results: A total of 70 persons participated in the study, where 34 participants were from Turkey, and 36 participants were from Norway. The Norwegian sample had a mean score of 68.12 (level 2), while the Turkish sample had a median ICT-score of 29.18 (level 1). There was a significant difference in ICT-score between the groups (U = 178; $p < .01$). Both the Norwegian sample and the Turkish sample had extensive experiences in assessing information sharing and the safety of publishing online, as well as using SMS/MMS and participating in network societies such as Facebook and Twitter. Little to no experience was found in creating new information and information management. When adjusting for possible confounders, there was no significant association in ICT-score and communicating with a doctor or a doctor's office by using a smartphone (OR = 1.037, 95% CI = 1.00, 1.076; $p = .053$). There was a significant association in ICT-score and sharing information about their health by using a smartphone (OR = 1.058, 95% CI = 1.002, 1.117; $p < .05$), as well as having an app related to health (OR = 1.058, 95% CI = 1.011, 1.106; $p < .05$).

Conclusion: The findings suggest that deaf people in Norway and Turkey have differences in their experiences in ICT-usage. A higher ICT-score increases the odds of having an app related to health and sharing health information by using a smartphone. A higher ICT-score will not increase the odds of contacting a health professional by smartphone. m-Health utilization among deaf people should be further explored.

Keywords: digital divide, digital skills, m-health, deaf community.

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Abbreviations

EU	European Union
ICT	Information and Communication Technology
ITU	International Telecommunication
LTE	Long-term Evolution
m-Health	mobile health
OECD	The Organisation for Economic Co-operation and Development
OR	Odd ratio
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHO	World Health Organization

1 Introduction

Over the past years, the Internet and technology have become an essential part of daily life (Polat, 2012). With the increase in the use of technology and particularly smartphones, mobile health (m-Health) has grown to have a rapid acceptance and wide distribution (Paschou et al., 2013). It is stated by WHO (2018) that the mobility and flexibility of m-Health have increased access to health care. Furthermore, WHO (2018) states that there is an increased proportion which is accessing health information and services through mobile phones. In the United States, there were over 40 000 health-related apps available as of 2013. These applications have objectives such as prevention/lifestyle, self-diagnosis, education, treatment compliance, and renewing prescriptions (Krebs & Duncan, 2015). m-Health empowers consumers by seeking a healthy lifestyle and monitoring their health and includes services such as online doctor's appointments through apps and messages (Faiola & Holden, 2017).

Despite the rapid growth and increased accessibility, studies have found differences in the use of technology and the Internet. Ragnedda (2017, p.9) states that "*fast-moving technological transformations have involved only a minority of the world's population, effectively excluding those who do not live in the developed world and those who are not part of the global economic elite*". In 2012, researchers found that the patterns of use of the Internet vary according to sociodemographic variables in the Turkish population. Differences were found based on age, gender, health status, and the degree of education and income (Polat, 2012). Studies have discovered similar findings in Norway (Gravdahl & Guthu, 2008). Therefore, the concept of "*digital skills*" has become necessary in the discussion of what kind of expertise and understanding citizens must have in the new knowledge society (Ferrari, 2012; van Laar et al., 2017).

Even though digital skills have raised essential areas of research, there is a lack of research on how technology is used or accessed by individuals who are deaf,

especially in the middle east (Al-Sarayrah et al., 2018). The importance of being able to efficiently use health technology is high as it can improve deaf people's quality of life (Ryan & Kushalnagar, 2018). Access to health services has previously shown to be challenging among deaf people (Alexander et al., 2012; Kuenburg et al., 2016). The Internet and health technology can break barriers to accessing health information, health care services, and communication, thereby empowering deaf people. Furthermore, the use of e-Health platforms can potentially reduce the health inequality deaf individuals currently are experiencing (Ryan & Kushalnagar, 2018). This could be especially important in a country where policy development and sign language recognition are low (Kemaloğlu & Kemaloğlu, 2012).

2 Theoretical background

2.1 The deaf community

The World Federation of the Deaf (2019, p.2) states: "*Deaf communities around the world have for a long time considered themselves as a linguistic and cultural group.*". Sign languages are complex and natural languages with their grammar, lexicon, humor, and associated performance forms. Approximately five percent of the world population are deaf or have a hearing loss, and it is estimated by World Health Organization (WHO) that over 900 million people will have a disabling hearing loss in 2050 (WHO, 2020). However, having sign language as a native language is not usually dependent on the degree of hearing loss, but of the identity as hearing impaired (De Meulder et al., 2019; Norges Døveforbund, n.d.).

Researchers have the last decades been practicing the term "Deaf" with a capital D to signify members of a sign language-using community. Researchers have used "deaf" with a lower case d to signify people who have a hearing loss and do not sign. Many are moving away from using "Deaf" and ground it with the increasing complexity of identities and language practices (De Meulder et al., 2019). In this study, only the term "deaf" will be used to refer to individual

people who are deaf.

Even though disability policies protect deaf people, recognition of sign language and deaf culture differs all over the world. De Meulder et al. (2019) have explored the legal recognition of sign language in both Turkey and Norway. The authors state that Turkey has made nationwide initiatives to include deaf people into Turkish society. That said, a study by Tufan and Arun (2006) states that individuals with hearing impairment in Turkey have the lowest literacy skills compared to the group of physical and visually impaired people, where 35% hearing impaired are categorized as illiterate. The same study states that 15% of hearing impaired are literate, but never finished any education. Moreover, four and four-tenths percent completed high school, and one and seven-tenths percent finished college (Tufan & Arun, 2006). There has been a history of few sign language interpreters and deficit education and legalization of official interpreters. Furthermore, educators in schools often have deficit skills in sign language, which increases poor education among deaf people (De Meulder et al., 2019).

Norway has no official statistics that provide an exact number of signers. The Norwegian deaf association (Norges Døveforbund) estimated in 2016 that there are approximately 16 500 signers, where 5000 are deaf. Others are family or people using sign language for professional purposes (Norges Døveforbund, n.d.). The Norwegian government has addressed sign language in policies the last years. Despite this fact, recent events with changes in education and the administration of official interpreters suggest that Norway now focuses on training deaf people to integrate with the majority rather than acknowledge the deaf community as a minority with their history and language (Berhove, 2018; Norges Døveforbund et al., 2019). In other words, they are learning to go to a state of oralism rather than a state of manualism.

2.2 The development of information and communication technology

Over the past years, information and communication technology (ICT) has become an essential part of daily life, affecting how we work, think, and

communicate. Huth et al. (2017, p.1) define ICT as *"an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems, and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning."*. In other words, it encompasses a wide range of technology that exists in almost every home and industry in the world. As technology continued to grow over the years, the United Nations and the International community at the World Summit on the Information Society agreed on a shared vision to build a *"people-centered, inclusive and development-oriented information society."* (World Summit on the Information Society, 2003, p.1). They established ten goals relating to ICT connectivity and access that intends to measure progress towards that vision (ITU, 2018). A report from the International Telecommunication Union (ITU) is published every year, evaluating if they reached the targets.

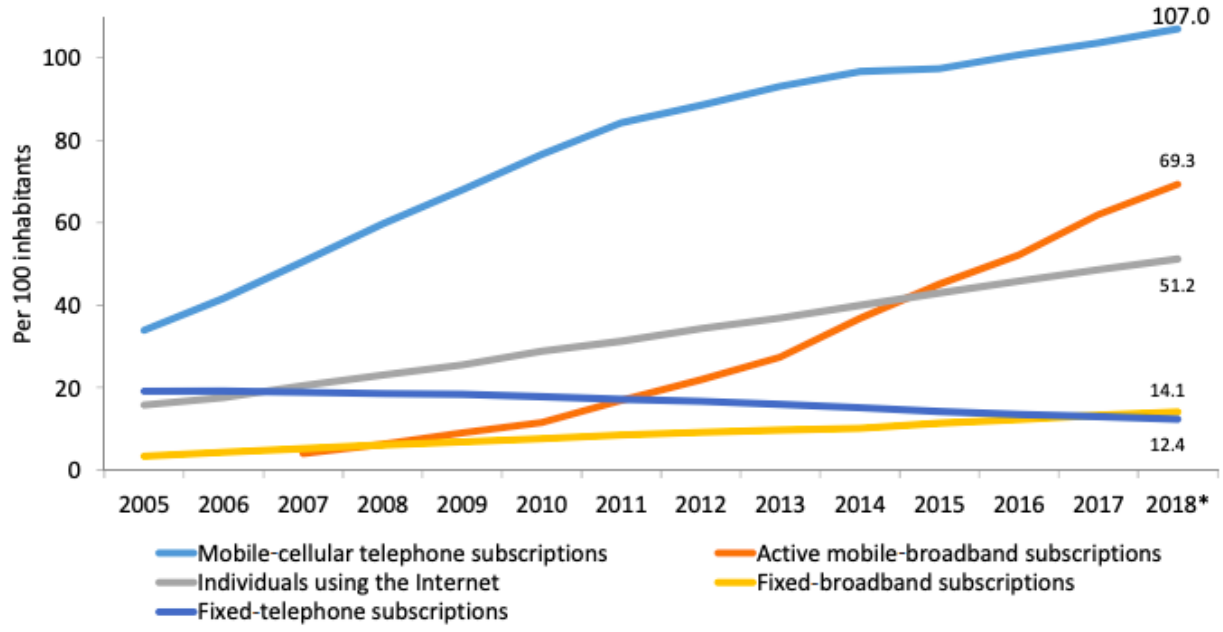


Figure 1: Global Changes in ICT (ITU, 2018, p.3)

Figure 1 shows the growth in indicators measuring ICT trends from 2005 to 2018 in the report "*International Telecommunication Union in 2018*". The report's findings suggest there is a continuous growth of mobile phones and

the Internet, and the availability and use of broadband networks and services. Fixed telephone subscription has been in decline for a long time due to the substantial growth of mobile-cellular telephone subscription and access to the Internet (ITU, 2018). Additionally, the report found that four out of five in developed countries had access to ICT. However, the report's findings suggest there is still an immense potential in developing countries where only 45% of the population is using the Internet (ITU, 2018).

ITU (2018) states that Norway is among the most advanced information societies and is continuing to develop ICT's role in both society and the economy. Norway is one of the leading countries in having the wireless Internet 4G Long-Term Evolution (LTE) available (92%), while Turkey has a 67% availability of LTE (OpenSignal, n.d.). Turkey is committed to becoming a digital information society as the rest of the countries in the European Union (EU). The e-Transformation Turkey Project was launched in 2003 to revise the legal framework and policies of ICT accordingly to EU standards (Çayhan, 2008). The advancements in technology and increasing customer request has driven the telecommunication sector to grow (ITU, 2018). The Turkish National Ministry of Education initiated the FAITH project in 2010. It sought to provide a high availability of ICT in classrooms as well as support teachers to become digital content creators (Polat, 2012). FAITH was supposed to end in December 2015, but the project reached only 10% of the main goals (European training foundation, 2018).

Content and services are moving online, replacing offline information. To access different sectors without using ICT is nearly impossible in developed countries. The Internet has impacted every industry, including health care.

2.2.1 ICT among deaf people

National and international studies related to technology have rarely included deaf people. However, some studies within the communities among deaf people around the world are found. Maiorana-Basas and Pagliaro (2014) found that deaf people are replacing the technologies that function as helping aids, such as

video relay service, with the more accessible and universally used technologies such as Facetime, Messenger or Skype. The study found preferences in technologies such as smartphones, computers, software for writing documents, and informational and social networking sites in the community in the United States. Similar findings are found all over the world (Garberoglio et al., 2015). In fact, Garberoglio et al. (2015) state that deaf people are even more likely to use technology compared with the majority in the population, and are often early adopters of particularly communication technology.

Although only 62% of the Turkish population had access to the Internet as of 2018, Ilkbaşaran (2015) discovered that a large number of deaf youth participants had a mobile phone; the majority were smartphones. The study found that mobile phones had a positive impact on the youths' life, but access to and the use of text messaging was dependent on textual literacy and the socioeconomic status of their families. Similarly, deaf youths in Norway experienced that the threshold for socializing with family and friends decreased by being able to message by SMS on a mobile phone, and that *"SMS has social, cultural and compensatory implications for the deaf teens and young adults."* (Bakken, 2005, p.172). People with disabilities, particularly deaf people, highlight mobile phones or smartphones as the most crucial ICT, as the phone gives them a greater degree of independence and control over their daily lives (Bufdir, n.d.). A study in 2018 exploring deaf youths' experience in ICT teaching in Turkish schools found that several students expressed it rewarding and useful (Sari & Pürsün, 2018). However, a large proportion of the youths in the study experienced there was a lack of equipment and insufficient skills among teachers in deaf schools to provide satisfactory ICT teaching.

2.2.2 Usage of digital health service systems

ICT is steadily integrated into health systems and services worldwide. Digital technologies are becoming a vital resource for health care delivery and public health. Many e-Health platforms have established portals for patients providing electronic communication, such as having access to results through medical

records and emailing doctors (The Norwegian Directorate of eHealth, 2020). e-Health has enabled people to share health information through m-Health applications, which is an integral part of e-Health (Ryan & Kushalnagar, 2018). Martínez-Pérez et al. (2013, p.3) define m-Health as *"medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants, and other wireless devices."*. In general, it is any mobile technology to improve health and health behaviors (Faiola & Holden, 2017). Mobile technologies are particularly relevant today due to their ease of use, broad reach, and wide acceptance (WHO, 2018). With the increase of technology usage and particularly smartphones, m-Health has drawn global attention and wide distribution (Paschou et al., 2013).

A study in Turkey found that 68% of mobile application users have downloaded at least one m-Health application (Doganyigit & Yilmaz, 2015). The study also found that health information is the fastest-growing content category among Turkish mobile users. The majority of the population searched for their health condition-related information before going to a doctor, information on pharmaceuticals, and treatment prescription information after they went to a doctor. However, only eight percent of the population downloaded apps with information such as hospital meetings, looking up doctors, and pharmacies. A large proportion of the sample in the study had higher education, which could affect the results as highly educated people are more likely to use and adopt new technology (Doganyigit & Yilmaz, 2015; Mohamed et al., 2011).

In Norway, both private and governmental agencies have developed multiple e-Health platforms for citizens, including m-Health. Applications such as HelseRespons ™, Helsenorge.no ™ , and Pasientsky ™ have gained rapid growth in consumers' daily life, and digital communication with health care providers in Norway is in a never-ending development (Forbrukerrådet, 2018). As of December 2019, Norwegians ordered 380 000 doctor's appointments by digital communication on the governmental app and web-page (The Norwegian Directorate of eHealth, 2020). Additionally, a large proportion of the population has started to use e- and m-Health platforms to renew prescriptions, contacting

the doctor's office, and using e-consultations to communicate with a doctor (The Norwegian Directorate of eHealth, 2020). The report only included users of public platforms. Thus, the number would be even higher if the report included users of private m-Health companies.

Digital communication with health care services has been given much attention during the last months. Usage and development of digital platforms in Norway have increased during the Covid-19 pandemic, and all over the world. The changes might revolutionize health care services by increasing consultations and resources online (Ting et al., 2020) and thereby increase the accessibility to health services in the population.

2.2.3 Health services access among deaf people

World Federation of the Deaf (2019) calls attention to the impact of the social model of disability. The social model states that the environment is disabling for someone with an "*impairment*", not the "*impairment*" itself. An individual with a physical disability is only disabled when there is a barrier in place. World Federation of the Deaf (2019, p.8) explains further that *"... the response to disability is not to fix the impairment, but rather to reduce or eliminate the barriers a deaf person faces in a hostile and inaccessible environment."*. Many deaf people experience they are often being seen through a medical and deficit lens. Several studies report that deaf patients face difficulties when approaching health care services (Alexander et al., 2012; Kuenburg et al., 2016; Ryan & Kushalnagar, 2018). A study found out that 32 out of 39 countries' respondents reported deaf people in their countries face difficulties when trying to access health services, including 13 very high Human Development Index countries (Fellinger & Kuenburg, 2011). The high rate of deaf peoples' experienced difficulties often is caused by audism, a misconception of deaf people by health professionals, and barriers due to language and culture (Alexander et al., 2012; Kuenburg et al., 2016; Morris et al., 2017; Ryan & Kushalnagar, 2018).

It is well known that the development of ICT has had an impact on deaf people's quality of life. However, there has been a long tradition of being

late for developments of technology that specifically includes deaf people. For instance, the Directorate for Civil Protection and Emergency in Norway launched Emergency-SMS (Nød-SMS) in 2018, a pilot study enabling deaf and hard of hearing people to communicate with the emergency services in Norway by text messaging (Warnicke, 2019). Before this development, deaf people had no way of contacting the emergency services outside their own home. The development of deaf specific m-Health has gotten increased attention in the last years (Romero et al., 2019). However, none are explicitly found aiding Norwegian deaf people or Turkish deaf people in communication with health professionals. Moreover, even though m-Health applications exist in general, such as the text-based HelseRespons ™ in Norway, it might not necessarily be the case that all deaf people have the skills required to use them. Ryan and Kushalnagar (2018, p.838) highlight "*the importance of developing and improving strategies to leverage the Internet, social medias and e-health platforms for deaf consumers, especially those who already use the Internet.*".

2.3 Differences in technology usage among the world

The emergent of ICT and the information society has created a new term in research, namely the digital divide. Researchers have constructed numerous studies concerning this side of technology, more specifically, how unequal access to digital technologies brings unequal participation in society (Van Dijk, 2005). Even though technologies may be designed to improve health and quality of life, and the fact that the gap in access to the Internet has progressively declined, the benefits of usage are not commonly experienced by all users. The differences in the benefits of usage results in an increasing divide (ITU, 2018; Weiss & Eikemo, 2017). To use ICT has been linked to social and economic well-being in several studies (ITU, 2018; Minocha et al., 2015; Van Dijk, 2005), and it is more important than ever to have access to services and content that are moving online and replacing offline information and services.

Research has developed into looking at different levels of the digital divide

and turned into a first-level, second-level, and a third-level digital divide (van Deursen & Helsper, 2015). As an example, Figure 1 (p.4) shows rapid growth in the use of ICT. The report also indicates a first-level digital divide, as the report found inequalities in access to ICT in a regional, national and local perspective (ITU, 2018). In other words, there is still a first-level digital divide in countries such as Turkey. In countries such as Norway, where most of the population has access to the Internet in some form, research has shifted to analyzing the importance and differences of skills and usage, the so-called second-level and third-level digital divide. Research has found a clear connection between using ICT and economic and sociodemographic status, where usage of technology and the Internet often are favorable to male, young, educated, working, and healthy individuals (van Dijk, 2012; Weiss & Eikemo, 2017). These findings are also found in Norway and Turkey (Gravdahl & Guthu, 2008; Polat, 2012; Skills Norway, 2018).

2.3.1 The digital divide and disability

Turkey attempted to become a part of a digital information society. However, some might argue that they failed to address the most disadvantaged groups (European training foundation, 2018; Hazar, 2018; Polat, 2012). Policies and studies all over the world have neglected digital inequality and disability (Goggin, 2016), including Norway.

The Internet has created a new arena for interacting with others. It is considered both an opportunity and a challenge for people with disabilities as sufficient resources, tools, or skills to benefit from the Internet fully might be absent (Duplaga, 2017). As Goggin (2016) states, when developing technologies, a multi-face approach is rarely adopted, and an assumed ideal type of the deaf user might not represent the complex population. Hence, developers overlook many kinds of impairments, situations, and experiences of disability (Goggin, 2016). Additionally, the spoken language is not always fully accessible for deaf people. Videos and audios are seldom captioned, causing information inaccessible to deaf people, which could lead to intellectual, economic, and social disparity

(Garberoglio et al., 2015; Maiorana-Basas & Pagliaro, 2014).

Digital participation is another concept that is related to the use of technology in health care services and people with disabilities. Digital participation tells something about how active a person is in using forms of electronic communication made available by computer technology (Daus et al., 2019). Exclusion from digital communication is feared to be one of the most common ways to exclude young individuals, and is particularly critical in groups who are already marginalized (Söderström, 2015).

Although it is well known that digital inequalities exist, smartphones and Internet access are now widespread (Garberoglio et al., 2015). Ferrari (2013, p.7) states: *"It is in fact recognized that participation in the digital domain is no longer a question of "have" or "have not", but rather an issue of competence."*.

2.3.2 Digital skills

The concept of digital skills has been necessary for the discussion of what kind of skills and understanding citizens must have in the new knowledge society (Ferrari, 2012; van Laar et al., 2017). During recent years, researchers have used several terms to describe skills necessary in using ICT, such as digital skills, digital competence, digital literacy, or ICT skills. In later years, digital skills and digital competence have been more rapidly used. Ilomäki et al. (2011) states that the terms digital competence and digital skills are so varied, and no common concept or globally agreed definition exists, as the technology and the skills necessary to use it continue to change and grow. The fact that digital competence and digital skills have drawn attention in several countries all over the world and that there are many various definitions and concepts reflects their importance. The terms are increasingly discussed, particularly in policy documents and policy-related discussions related to "... *what kinds of skills and knowing people should have in a knowledge society, what to teach young people and how to do so.*" (Ilomäki et al., 2016, p.655).

Ferrari (2012, p.3) states digital competence includes *"information management, collaboration, communication and sharing, creation of content and knowledge, ethics and responsibility, evaluation and problem solving and technical operations."*. The European Parliament and the Council classified digital competence as one of the eight key competencies for lifelong learning, and they addressed the importance of the inclusion of adults and elderly individuals in the new emerging society (Ferrari, 2012). Several have made comprehensive frameworks in an attempt to clarify and conceptualize digital competence. One of Europe's most commonly used frameworks is the EU's Digital Competence Framework for Citizens (DigComp). DigComp 1.0 was developed in 2013 (Ferrari, 2013), and has been developed continuously over the years (Brečko & Ferrari, 2016; Redecker & Punie, 2017). However, even though DigComp is a comprehensive and widely known framework, it does not include specific instruments to measure digital competence in populations.

United Nations Educational, Scientific and Cultural Organization (UNESCO) defines digital skills as "*a range of abilities to use digital devices, communication applications, and networks to access and manage information.*" (UNESCO, 2018). Further, UNESCO (2018) states that digital skills enable individuals to create and share, communicate and collaborate, and solve problems for self-fulfillment in life. There are many similarities when comparing the definitions of the two terms. However, in more recent publications, the term competence used is more often than skills, representing a more extensive content of the concept (Ilomäki et al., 2011). The Norwegian authorities' understanding of digital competence largely coincides with EU's DigComp. However, they use the term "*digital skills*" rather than "*digital competence*" (NOU 2019:2, 2019). This study will mainly be using the term digital skills when discussing what kinds of skills are needed to participate in the digital information society.

Several agencies in Norway have had increased attention to digital skills, and the agencies have discussed it rapidly as an essential skill the Norwegian population needs to participate in society. One of the frameworks developed

and often used in Norway is the framework of digital skills by Skills Norway (Kompetanse Norge).

2.3.3 Skills Norway

The framework of Skills Norway's survey has some similarities to the EU's DigComp framework. Unlike the EU's DigComp, Skills Norway has developed specific instruments that enable them to do exact measurements of digital skills in the Norwegian population. The directorate defined digital competence as "*the sum of various digital skills*" (Skills Norway, 2011), and identified eight focus areas of skills within digital skills; Define information needs, access to information, technological self-reliance, information management, communication and information sharing, integration of information, and creating new information (Skills Norway, 2011). Skills Norway has used digital competence in most of its analyses and reports, but in recent years, the directorate has shifted to using digital skills. The shift in terms could be due to the lack of safety focus in their framework that is not consistent with the newer definitions and frameworks of digital competence (Ilomäki et al., 2011), as well as the Norwegian government's usage of digital skills rather than competence.

The survey is inspired by the work of Educational Testing Service and follow the Norwegian government's specific aims regarding technology usage in the Norwegian population (Daus et al., 2019; Skills Norway, 2011). The studies of Skills Norway maps digital skills as well as motivational aspects and exposure of digital usage in the workplace. Skills Norway has replaced various questions related to digital skills over the years due to the development and change of requirements in Norwegian society (Skills Norway, 2018).

One of the main critiques of the studies by Skills Norway is that there is no consistent routine in assessing digital skills in the Norwegian population (Daus et al., 2019).

2.3.4 Digital skills in Norway and Turkey

The Organisation for Economic Co-operation and Development (OECD) has for several years evaluated the digital development in member countries of OECD. The report states that Norway has a very high level of digital skills, and the gap of digital skills in the population is among the lowest within OECD. There have been rather few studies mapping and rating digital skills in the Turkish population. However, the OECD reports that the digital skills in Turkey are substantially lower than the average of the rest of the member states (OECD, 2019).

Another report from *EU, Kids Online*, comparing online activities and digital skills in schools in Europe, found that Turkey had the lowest level of digital skills and low online activity. In contrast, children in Norway had a high level of both digital skills and activities (Sonck et al., 2011). The findings in the report are shown in figure 2. Norway has invested in digital education, and digital skills have become one of the five basic skills children should be taught at school. Turkey has, as of 2019, no strategy in digital education (Bourgeois et al., 2019).

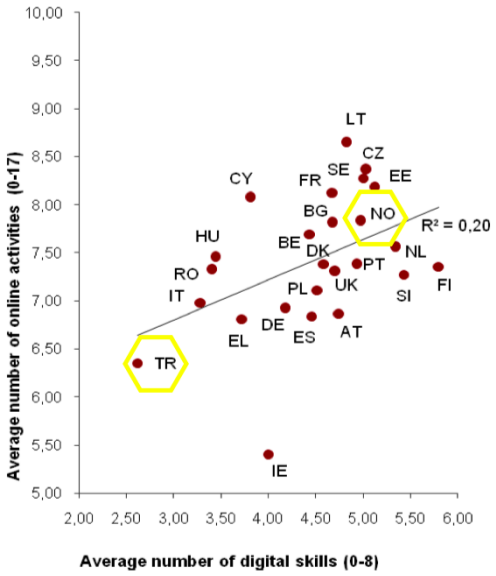


Figure 2: Digital skills and online activities among kids in Europa (Sonck et al., 2011, p.4)

With Norway's commitment to ICT development, digital skills have been assessed thoroughly in the Norwegian population over the last ten years by Skills Norway and Vox (Gravdahl & Guthu, 2008; Guthu & Lønvik, 2011; Skills Norway, 2018). The studies show increasing growth in the proportion using ICT in daily life, as well as an increased experience with ICT usage in the population (Gravdahl & Guthu, 2008; Guthu & Lønvik, 2011; Skills Norway,

2018). However, Skills Norway and Vox performed the studies by telephone interviews. By using this recruitment method, the studies automatically exclude the group of individuals who are hearing impaired.

Although a few studies have addressed the technology usage among deaf people, none have evaluated digital skills among deaf people in Norway and Turkey. Several studies exploring technology usage have had samples with a higher proportion of younger adults. A young sample could have impacted the results as previous studies have shown different Internet use patterns among age groups. Maiorana-Basas and Pagliaro (2014) emphasize that the digital divide should not progress to a "*digital marginalization*". The authors urge professionals in both the hearing and deaf communities to work towards full and equal access to technology and the Internet so that deaf can participate fully in society. The use of technology can empower individuals by having increased control over their health. This has particularly been important in the deaf community (Ryan & Kushalnagar, 2018).

3 Rationale

The UN Convention on the Rights of People with Disabilities states access to health care without barriers is a clearly defined right of people with disabilities. Access to health care affects the health of deaf and call attention to provide a better health service. A key objective implementing digital health, and particularly m-Health, is to increase access to health services, particularly for hard-to-reach populations. Even though the technology might be available, previous studies have not explored whether deaf people have the skills necessary to use such devices and applications.

3.1 Objectives and research questions

This study aimed to (1) assess the digital skills, (2) map the use of m-Health applications to communicate with health care providers, and (3) compare the digital skills and use of m-Health applications among deaf adults in Turkey and

Norway.

Specific research questions in this study were:

• *Will the level of digital skills influence the use of m-Health applications to communicate with a health care provider in deaf adults in Turkey and Norway?*

• *Is there a difference in digital skills and the use of m-Health applications in deaf adults among Turkey and Norway?*

4 Methods

4.1 Study design

This was an exploratory cross-sectional comparative study using a questionnaire in Turkey and Norway designed to measure self-reported digital skills and the use of m-Health applications to communicate with a health care provider among deaf adults. Associations between digital skills and the use of m-Health applications in Turkey and Norway were evaluated.

4.2 Study population

4.2.1 Sampling

Deaf individuals in Turkey and Norway are a hard-to-reach population. A strategic purposive sampling and convenience sample was applied. To reach the population of Turkish and Norwegian signers, the deaf organizations in Stavanger, Trondheim, and Antalya were approached for help to get in touch with signers fitting the inclusion criteria. By doing so, the study reached individuals who consider themselves as part of a deaf community. The student got an invitation to meetings at the deaf association in Antalya, and the deaf organizations in Stavanger and Trondheim, where the questionnaire was distributed to signers fitting the inclusion criteria.

4.2.2 Inclusion and exclusion criteria

Inclusion criteria: Using sign language as the primary language and aged 18-64.

Exclusion criterion: Signers having a cognitive disability.

The criteria were explained to those working in the deaf organizations, as well as explained before recruitment by the master student. Therefore, those working in the deaf organizations and the master student assessed cognitive disability, not health professionals.

4.3 Data collection

The data collection was performed in two periods. The first data collection was conducted in Antalya in September 2019 to October 2019, and the second data collection was performed in Stavanger and Trondheim from January 2020 to March 2020.

The questionnaire was a pen-to-paper questionnaire to not exclude people with low digital skills or non-users of ICT. Due to poor literacy skills and illiteracy in the Turkish deaf population, the questionnaire was interpreted individually face-to-face. In Norway, an interpreter was available if needed.

4.3.1 Instruments

The questionnaire included questions related to sociodemographic variables such as age, gender, and education. Furthermore, it included questions about the participant's preferred language, both overall and at the doctor's office, a self-reported questionnaire in digital skills, and the use of m-Health applications to communicate with a health care provider. It was retrieved already used questions from published research to ensure the items were valid and reliable.

Three deaf specific questions have been retrieved from a study researching deaf individuals' communication with a health care provider (Ryan & Kushalnagar,

2018):

1) *Are you born with deafness? (yes/no)*

2) *What language do you prefer? (sign language/ Norwegian/Turkish/ both)*

3) *What language do you prefer when visiting your doctor? (sign language (direct or with an interpreter)/ Norwegian/Turkish(written or oral))*

Digital skills are challenging to measure by survey methods. Studies are vulnerable to bias when people assess their skills, and thus the questions measure the experience the participants have in conducting different tasks using ICT. The self-reported digital skills items were retrieved from studies conducted by Skills Norway (Gravdahl & Guthu, 2008). The respondents rate their own experience with different tasks connected to the use of ICT on a scale between 0-3, where 0 is *"no experience"* and 3 is *"comprehensive experience"* (Skills Norway, 2011). In collaboration with researchers from Turkey regarding technology usage among the Turkish population, we retrieved 37 items from the original questionnaire, which encompasses these areas: 1. Defining information needs, 2. Access to information, 3. Technological self-reliance, 4. Information management, 5. Information assessment, 6. Integration of information, 7. Communication and information sharing, and 8. Creating new information. The same questionnaire was used in Norway. The questions retrieved from Skills Norway are included in Appendix 1.

Three m-Health specific questions were retrieved from a national survey exploring the use of technology (Health Information National Trends Survey, n.d.):

1) *During the past 12 months, have you used a smartphone to communicate with a doctor or a doctor's office? (yes/no)*

2) *On your tablet or smartphone, do you have any software applications or "apps" related to health? (yes/no)*

3) *Have you ever shared information about your health with a health care professional using apps? (yes/no)*

The questionnaire related to digital skills was available in both Norwegian and English by Skills Norway. It was translated from English to Turkish in

collaboration with researchers from Turkey. A pilot was conducted in both Antalya and Stavanger, and no changes were made before continuing the study. The questionnaire is included in Appendix 3 and 5.

4.4 Statistical analysis

The data was anonymized so it would not be possible to distinguish individual participants. The self-reported experience in digital skills was indexed into a total ICT-score ranging from 0 to 100 for each participant, where each of the eight measures of skills had the same weight. The data was then organized and analyzed further with IBM® SPSS® Statistics 26.0. The participants were categorized into four different levels of ICT-users based on their score: (0) non-users, (0,1-40) weak users, (40,1-70) intermediate users, and (70,1-100) strong users.

The variables were tested by normality tests and checked by histogram and Q-Q plots to evaluate the assumption of normality. When $N \geq 50$, a Kolmogorov-Smirnov Lilliefors test was performed, whereas a Shapiro Wilk test was performed when $N < 50$. Non-normally distributed data were checked of extreme values. No outliers were excluded in the data set.

Descriptive statistics and cross tabulations were used to describe the sample and compose sample differences. The cells were checked for expected counts. When assumptions were met, a Pearson Chi-squared test was used to test the differences in the groups. When assumptions were not met, a Fisher's Exact test was used. A Mann-Whitney U-test was used to compare an overall ICT-score between the two groups. Moreover, assumptions to perform regression analysis were evaluated, and regression analyses were used to analyze digital skills among the different groups. Logistic regression analysis was performed to assess associations between the level of digital skills and the use of m-Health applications. In the adjusted model, participant characteristics (age, gender, language) and country (Norway, Turkey) were controlled for. Chi-squared statistics were used to assess differences between the nationalities, and Crohnbach's Alpha was used to check for reliability and variation in the

questionnaire.

The significance level was set to $p \leq 0.05$.

4.5 Research ethics

Studies have shown that deaf people may have some inadequate literacy skills as written language is their second language, and deaf participants could possibly have difficulties understanding the questions asked in a written and self-reported questionnaire (McKee et al., 2013). Therefore, the information letter was written in an easily understandable language. McKee et al. (2013) emphasize the use of an interpreter when the participants are deaf. The information letter and questionnaire were interpreted to sign language one-by-one in Turkey. In Norway, overall information about the study was given in sign language by the master student. The master student was available for interpretation if necessary, when the participants filled out the questionnaire. The information letter was attached to the questionnaire, informing about the purpose of the study and what context the data was to be used. The letter stated that participation was voluntary and anonymous. The participant gave written consent by signing the information letter.

The study in this thesis did not require formal clearance from the Regional Committee for Medical and Health Research Ethics (REC) in Norway because it did not involve the collection of personal health data or biological material. Norwegian Data Protection Services approved the study. No personal details of the participants are reported or published, ensuring anonymity and confidentiality.

5 Results

5.1 Sample description

A total of 70 persons answered the questionnaire. Table 1 shows a summary of demographic data. Thirty-four respondents were from Antalya, Turkey,

where 44.1% were women, and 55.9% were men. The highest education degree of the Turkish population was high school, 50% had completed primary school, and 14.7% had no education. Ninety-one and two-tenths percent of the sample reported that they were born deaf. Eighty-eight and two-tenths percent answered that they preferred sign language in daily life, and 11.8% preferred both oral and sign language. Only one participant preferred spoken language (through writing or oral) at the doctor's office.

Thirty-six respondents were from Norway, 10 were currently living in Stavanger, and 26 were currently living in Trondheim. The sample consisted of 44.4% women and 55.6% men. A large proportion of the Norwegian sample was highly educated; 33.3% reported having finished a degree of higher education. Sixty-three and nine-tenths percent of the Norwegian sample had completed high school, and one respondent reported having primary school as the highest education. None of the Norwegian deaf respondents had no education. In the Norwegian sample stated 77.8% that they were born deaf, and 72.2% reported that sign language was the preferred language, and 94.4% preferred signing at the doctor's office.

Table 1: Sociodemographics and deaf adults' language preference in Turkey and Norway

	Turkey N = 34		**Norway** N = 36	
	N	%	N	%
Gender				
Woman	15	44.1	16	44.4
Man	19	55.9	20	55.6
Age				
18-24	3	8.8	3	8.3
25-34	8	23.5	11	30.6
35-44	11	32.4	8	22.2
45-54	10	29.4	9	25.0
55-64	2	5.9	5	13.9
Education				
No education	5	14.7	.	.
Primary school	17	50	1	2.8
High school	12	35.3	23	63.9
Higher education			12	33.3
Born deaf				
Yes	31	91.2	28	77.8
No	3	8.8	8	22.2
Preferred language				
Sign language	30	88.2	26	72.2
Oral	.	.	.	.
Both	4	11.8	10	27.8
Preferred language at doctor's office				
Sign language*	33	97.1	34	94.4
Oral**	1	2.9	2	5.6

**Direct or through an interpreter ** Written or oral*

5.1.1 Differences in education among Norwegian deaf people and Turkish deaf people

The cross tabulations composing sample differences had cells with expected count <5, and Fisher's Exact test was used. There was a significant (p <.01) difference in education level between Norwegian deaf adults and Turkish deaf adults. There was no significant difference in education between gender, both overall (p = .45), within Norway (p = .7), and within Turkey (p = .24).

There was a significant difference in education between the age groups. In Turkey, all the respondents between the age of 18-24 had completed high school, while those with no education was between the age 35-54 (p <.01). In Norway, education did not differ significantly among the age groups (p =

.07).

5.2 Digital skills among the populations

A higher proportion (73%) of the Turkish sample had an overall experience equivalent to a level 1 (weak users). Fourteen and seven-tenths percent had an ICT-score equivalent to a level 2 (intermediate users), and 11.8% had an ICT-score equivalent to a level 3 (strong users). No respondents had a score equivalent to level 0 (non-users). The median ICT-score among the Turkish sample was 29.18 (IQR = 28.04), and a mean score of 35.48 (SD = 24.73), which is corresponding to a level 1 ICT-user. Similar to the Turkish sample, the Norwegian sample had no participants with an ICT-score equivalent to a non-user. In the Norwegian sample, one participant reported an ICT-score equivalent to level 1. Fifty-two and eight-tenths percent had an ICT-score equivalent to level 2, and 44.4% had an ICT-score equivalent to level 3. The Norwegian sample had a median score of 65.14 (IQR = 21.62), and the mean score was 68.12 (SD = 15.62), which corresponds to a level 2 ICT-user. An overall display of the ICT levels is shown in figure 2.

The Kolmogorov-Smirnov Lilliefors test, histogram, and Q-Q plots showed a normal distribution of ICT-score overall in both countries, D(70) = .12, p= .06. The Shapiro Wilk tests were used testing normality in ICT-score within Norway and Turkey. The results concluded that the null hypothesis, that there was no difference between the distribution of ICT-score in Norway, could be rejected, and a normal distribution was assumed, D(36) = .96, p = .087. The ICT-score in Turkey had a significance level of $p <$.001 (D(34) = .83) with a positively skewed histogram, and the assumption of normal distribution was not met. Therefore, different analysis methods were used for the two samples.

The mean difference in ICT-score between the two countries was 32.64. A Mann-Whitney U-test was used to compare the ranks between the two populations. The ICT-score in the Norwegian deaf population was significantly higher than in the Turkish deaf population (U = 178; $p <$.01).

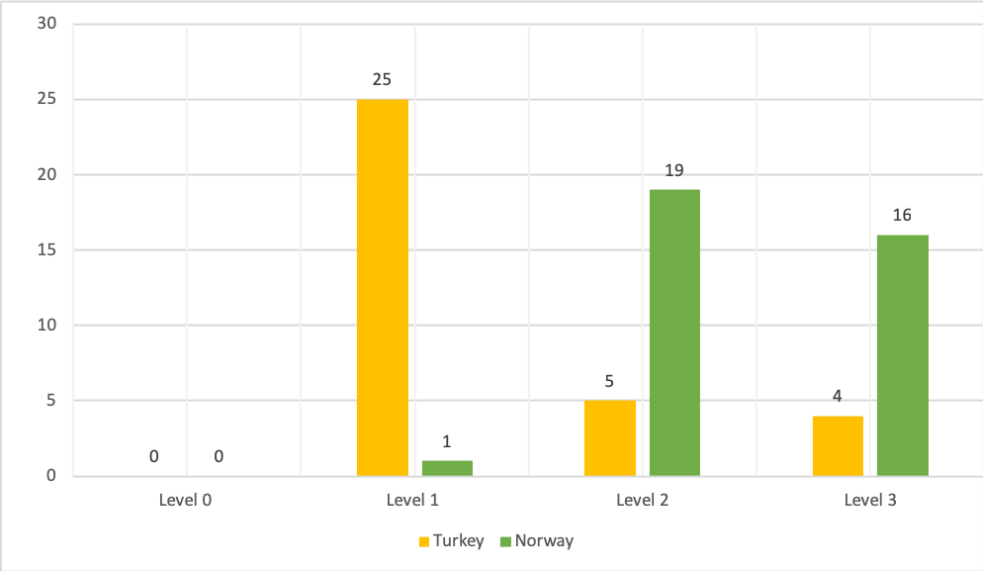


Figure 3: Distribution of ICT levels

The model assumptions to perform regression analysis were met. A simple linear regression and a multiple regression analysis were used to analyze if there was any linear relationship between sociodemographic variables and ICT-score. There was a significant linear relationship in nationality, education, being born deaf, and preferred language in daily life and ICT-score among the populations (table 2). Age, gender, and preferred language at the doctor's office did not have a significant linear relationship with ICT-score.

Multiple linear regression was used to examine the association of all the covariates and ICT-score, and there was a significant linear relationship in ICT-score and nationality, education, and being born deaf (table 2). There was no significant linear relationship between the preferred language in daily life and ICT-score, as well as preferred language at the doctor's office, gender, and age. Specifically, the results indicate that when nationality changes from Turkey to Norway, the ICT-score will increase with a mean score of 17.05 after adjusting for variables such as age, gender, education, and deaf specific variables.

Table 2: Linear regression for digital skills with ICT-score as the dependent variable

Variables	RR	95% CI
Nationality [a]	32.63**	22.82 - 42.44
Age [b]	-4.01	-9.41 - 1.40
Gender [c]	7.98	-4.54 - 20.50
Education [d]	20.99**	15.16 - 26.82
Born deaf [e]	-24.89**	-42.10 - -8.68
Preferred language in daily life [f]	11.30**	3.92 - 18.68
Preferred language at the doctor's office [f]	16.93	-13.88 - 47.73

Variables	Adjusted RR	95% CI
Nationality [a]	17.05**	4.66 - 29.44
Age [b]	-1.38	-5.48 - 2.72
Gender [c]	4.22	-4.68 - 13.12
Education [d]	10.96**	2.88 - 19.03
Born deaf [e]	-14.32*	-26.49 - -2.16
Preferred language in daily life [f]	4.47	-1.32 - 10.27
Preferred language at the doctor's office [f]	7.45	-14.78 - 29.68

**p <.05, **p <.01*

[a] *Turkey as reference group*

[b] *18-24 as reference group*

[c] *Woman as reference group*

[d] *No education as reference group*

[e] *Being born deaf as reference group*

[f] *Having sign language as preferred language as reference group*

5.2.1 ICT-skills among Turkish and Norwegian deaf adults

The results in Shapiro Wilk test, testing normality in ICT-score in the ICT-areas in the Turkish sample, showed a normal distribution could not be assumed in the areas:

1. Defining information, D(34) = .82, $p < .01$,
2. Access to information, D(34) = .82, $p < .01$,
3. Technological self-reliance, D(34) = .86, $p < .01$,
4. Information management, D(34) = .64, $p < .01$,
6. Integration of information, D(34) = .78,$p < .01$,

and 8. Creating new information, D(34) = .49, $p < .01$.

The test showed normal distribution could be assumed in the areas:

5. Information management, D(34) = .94, $p = .053$

and 7. Communication and information sharing, D(34) = .94, $p = .052$.

Similarly, in the Norwegian sample, the results in the Shapiro Wilk test concluded that a normal distribution could not be assumed in the areas:
1., D(36) = .80, $p < .01$,
2., D(36) = .91, $p = .01$,
5., D(36) = .88, $p < .01$,
and 8., D(36) = .86, $p < .01$.

Normal distribution could be assumed in area 3., D(36) = .96, $p = .3$, area 4., D(36) = .96, $p = .21$, area 6., D(36) = .97, $p = .34$, and area 7., D(36) = 97, $p = .37$.

The Norwegian sample reported a more comprehensive experience in all ICT-areas compared with the Turkish sample. Even though the experience rates were different, some similarities between the two populations were found. Both samples had the most experience in the ICT-areas information assessment (median ICT-score of 50 in the Turkish sample, and 85 in the Norwegian sample), communication and information sharing (46/70), and defining information needs (40/70). The areas with the most limited ICT-score in both nations were in creating new information (0/55), information management (0/62.5), and integration of information (12/58). A display of medians is shown in figure 4.

In summary, both nationalities had comprehensive experiences in defining what kind of information they needed and could retrieve the information using the Internet. Both samples had the most experience in sharing and exchanging information and knowledge with the aid of ICT. They also assessed the quality, relevance, and usefulness of the information they find, as well as internet safety online. Both nations had the least experience in creating and presenting new information with ICT, sorting and organizing information, and interpreting, summarizing, and comparing the information with the aid of ICT.

Both the Norwegian deaf people and the Turkish deaf people had high ICT-scores in sending and receiving SMS/MMS from a mobile phone and participating in network societies such as Facebook or Twitter. Norwegian

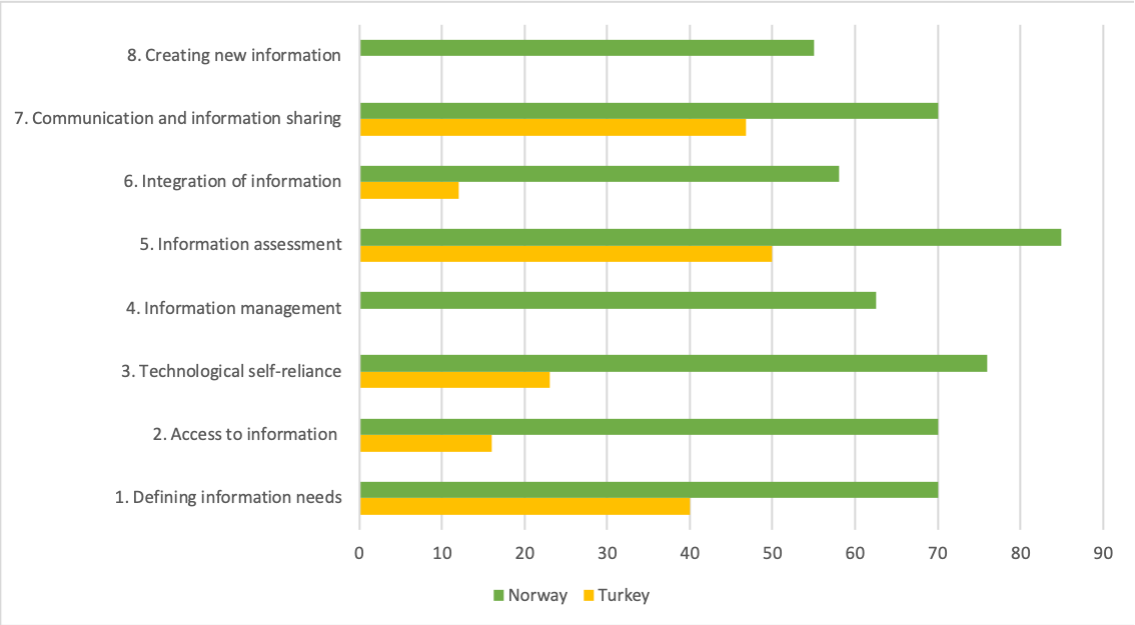


Figure 4: Median ICT-score in the ICT areas

deaf people had more experience in opening computer programs independently, whereas the Turkish deaf people had a high ICT-score in connecting to the Internet using a mobile phone. Both Turkish deaf people and Norwegian deaf people had the least experience in finding websites in languages other than Norwegian and Turkish. Norwegian deaf people had limited experience in participating in cooperation and project groups over the Internet, while one of the most limited experience in ICT-skills among the Turkish deaf people were buying or selling goods through websites in other languages than Turkish. Distribution of the participants' reported ICT-score in the ICT-skills measured is found in figure 5.

5.3 Digital skills and the use of m-Health

A large proportion of the samples reported not having used a smartphone to communicate with a doctor or doctor's office. Twenty-two individuals in the Norwegian deaf sample reported "no", and 14 individuals reported "yes". Twenty-three individuals in the Turkish deaf sample reported "no", while 11 reported "yes". A more substantial proportion possessed an app related to health, whereas 54% in the Norwegian sample and 30% in the Turkish sample had an app related to health. Twenty-four out of 36 participants in the

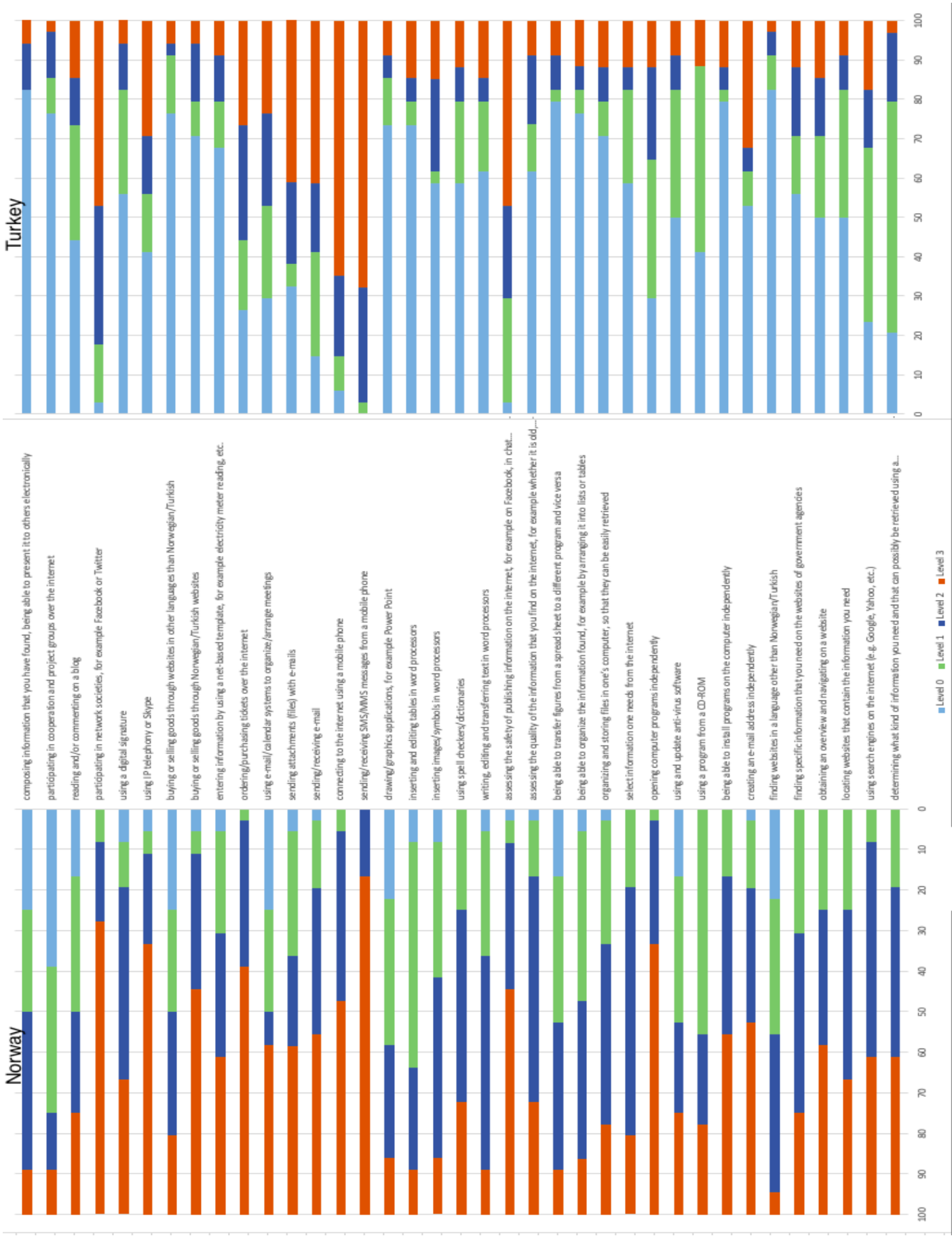


Figure 5: Distribution of the participants' reported ICT-score in ICT-skills

Norwegian sample did not share information about their health, whereas 27 out of 34 participants in the Turkish sample did not share their health information by smartphone.

Cross tabulation was used to compose differences in m-Health usage. All expected counts in the tabulations regarding m-Health and nationality, gender, being born deaf, and preferred language in daily life were ≥ 5, and a Pearson Chi-squared test was used. Tabulations with the variables age and preferred language had cells <5, and a Fisher Exact test was used.

The results showed there was no significant association in usage in m-Health between Norwegian deaf people and Turkish deaf people, either in having an app related to health, $x^2(1, N = 70) = 3.64$, $p = .06$, having contacted their doctor the last 12 months using a smartphone, $x^2(1, N = 70) = 0.33$ $p = .57$, or in having shared information about their health by smartphone, $x^2(1, N = 70) = 1.44$, $p = .23$. There was a significant association when comparing men and women and whether or not having contacted a doctor the last 12 months using a smartphone, where more men had contacted a doctor using a smartphone than women, $x^2(1, N = 70) = 4.18$, $p < .05$. There was no significant difference in men and women in having an app related to health, $x^2(1, N = 70) = 0.00$, $p = .98$, or have shared information about their health by smartphone $x^2(1, N = 70) = 0.57$, $p = .44$. When comparing gender and contacting a doctor with a smartphone within countries, there was no significant difference between men and women in Norway $x^2(1, N = 36) = 0.71$, $p = .4$), and a significant difference between the genders in Turkey $x^2(1, N = 34) = 4.44$, $p < .05$). Whether or not being born deaf had a significant association in all related m-Health variables. A higher proportion of those not being born deaf had an app related to health $x^2(1, N = 70) = 4.78$, $p = <.05$, communicated with the doctor by smartphone $x^2(1, N = 70) = 4.43$, $p < .05$, and shared information about their health compared with those being born deaf $x^2(1, N = 70) = 8.79$, $p < .01$. There was no difference in preferred language in daily life and having an app related to health, $x^2(1, N = 70) = 0.74$, $p = .39$, contacting a doctor with the use of smartphone $x^2(1, N = 70) = 1.56$, $p = .21$, or sharing information about their health $x^2(1, N = 70) =$

2.19, $p = .14$.

No significant relations were found in preferred language at the doctor's office in having an app related to health ($p = .55$), having contacted the doctor ($p = .98$), and sharing information about their health ($p = .97$). The age groups had a significant relation in having an app related to health when comparing age and the use of m-Health ($p < .001$). Having contacted their doctor or shared information about their health by smartphone did not differ significantly among the age groups ($p = .11$, $p = .19$).

Binary logistic regression was performed to examine the effect of digital skills on the likelihood of using m-Health.

Table 3: Logistic regression for the usage of m-Health

Variable	Log Reg OR	95% CI for log Reg
Having an app related to health		
Overall ICT-score	1.040**	1.016 - 1.064
Contacted doctor the last 12 months using a smartphone		
Overall ICT-score	1.030	1.008 - 1.052
Shared information about your health by smartphone		
Overall ICT-score	1.045**	1.017 - 1.074

*p <.05, **<.01

The binary logistic regression analysis showed there was a significant association between ICT-score and having an app related to health (table 3). The odds of having an app related to health were 1.040 times higher with increasing ICT-score. Individuals with a higher ICT-score were 1.045 times more likely to share information about their health by smartphone compared to those with a lower ICT-score. There were no significant higher odds of contacting a doctor using a smartphone when ICT-score increased.

When adjusting for sociodemographic variables such as age, gender, education, and preferred language to determine the impact of socioeconomic factors in using m-Health, the results showed the crude odds ratio (OR) increased from 1.040 to an adjusted OR of 1.058 in having an app related to health (table 4).

Similarly, the OR changed from 1.045 to 1.058 in sharing information about their health. The OR increased from 1.030 to 1.037 in contacting a doctor for the last 12 months using a smartphone. However, the OR was not significant. Nationality and preferred language had a significant contribution to the model in having an app related to health. None of the OR changes were considered large, and it was concluded that the possible confounders did not have an essential effect as the associations were approximately the same. The results of the adjusted logistic regression are displayed in table 4.

5.4 Internal consistency in the questionnaire

Crohnbach Alpha was used to test the internal consistency of the questionnaire. The alpha coefficient for the items regarding digital skills was .977, suggesting that the items have high internal consistency. m-Health-related items had an acceptable alpha value of .73.

Table 4: Adjusted logistic regression for the usage of m-Health

Variable	Log Reg adj OR	95% CI for log Reg
Having an app related to health		
Overall ICT-score	1.058*	1.002 - 1.117
Nationality [a]	0.520	0.069 - 3.895
Age [b]	0.435**	0.232 - 0.817
Gender [c]	0.578	0.152 - 2.198
Education [d]	1.168	0.348 - 3.919
Born deaf [e]	0.154	0.009 - 2.563
Preferred language in daily life [f]	0.721	0.264 - 1.967
Preferred language in doctor's office [f]	0.035*	0.001 - 1.006
Contacted doctor the last 12 months using a smartphone		
Overall ICT-score	1.037	1.00 - 1.076
Nationality [a]	0.228	0.038 - 1.354
Age [b]	1.377	0.803 - 2.362
Gender [c]	2.772	0.836 - 9.191
Education [d]	1.654	0.469 - 5.836
Born deaf [e]	0.339	0.069 - 1.668
Preferred language in daily life [f]	0.985	0.463 - 2.095
Preferred language in doctor's office [f]	0.524	0.027 - 10.260
Shared information about your health by smartphone		
Overall ICT-score	1.058*	1.011 - 1.106
Nationality [a]	0.416	0.063 - 2.730
Age [b]	1.457	0.788 - 2.696
Gender [c]	1.282	0.348 - 4.728
Education [d]	0.980	0.225 - 4.267
Born deaf [e]	0.262	0.055 - 1.248
Preferred language in daily life [f]	1.012	0.478 - 2.140
Preferred language at doctor's office [f]	0.638	0.30 - 13.735

**<.05, **<.01*

[a] *Turkey as reference group*

[b] *18-24 as reference group*

[c] *Woman as reference group*

[d] *No education as reference group*

[e] *Being born deaf as reference group*

[f] *Having sign language as preferred language as reference group*

6 Discussion

6.1 Main findings

This study sought to evaluate digital skills and the use of m-Health to communicate with health care professionals among deaf adults in Norway and Turkey.

6.1.1 Digital skills among deaf adults in Norway and Turkey

An important finding is that Norwegian deaf people had digital skills equivalent to a level 2 (intermediate user) of Skills Norway's levels of ICT-users. These findings are similar to the majority of the Norwegian population, where the mean ICT-score was equivalent to a level 2 in 2018 (Skills Norway, 2018). The results showed that the level of education had a strong association with ICT-score. The Norwegian deaf sample had a high proportion (33%) with a higher level of education. Another study has shown that 34% of Norwegians have a higher education level (Statistics Norway, 2019). In other words, deaf people having a higher education has been more common in Norway than approximately 15 years ago (Eide et al., 2004), and could explain why deaf in the present study have the same ICT-level as the majority population. A study evaluating the education level of individuals with hearing impairment states that the education level has increased in both people with and without a hearing impairment (Johansen, 2020). The study showed that 27.5% of people without a hearing loss had higher education. In comparison, 18.8% of people with mild and 21.3% of people with moderate hearing loss had higher education. However, this study only referred to hearing loss and not to people using sign language, and hearing loss does not automatically correlate with being a signer. The comparisons of the ICT-score in the Norwegian deaf sample and the Norwegian population might not necessarily give an accurate picture since the two studies are based on two different versions of the questionnaire of Skills Norway. Hence, the groups' similarities could be different if the comparisons were based on the same version.

There are low literacy skills among the Norwegian deaf population because deaf people consider the Norwegian written language as a second language (Warnicke, 2019). It would have been expected that deaf people in Norway would have a lower ICT-level than the majority population. An explanation for deaf people having the same level of ICT-experience as the majority population could be that deaf people adopt technologies more rapidly and earlier than their peers in the majority population (Garberoglio et al., 2015). Educators have rapidly used digital tools when educating deaf youths (Andersen & Trengereid, 2016), and consequently, this makes deaf people feel more comfortable using ICT. Furthermore, deaf people are more dependent on the use of ICT to communicate with others compared with hearing individuals. Thus this might increase the experience of using such ICT among deaf people.

The Turkish deaf people sample had an ICT-score equivalent to a level 1 (weak users) according to Skills Norway's ICT-levels. The research regarding digital skills in Turkey is limited. Because the penetration of technologies is rather low, and that digitization projects in Turkey were not successful, it could be suggested that a lack of guidelines in teaching, learning, and using ICT have a negative influence on the results. Education in Turkey is highly dependent on sociodemographic status (European training foundation, 2018). The Turkish deaf sample had low education, which could indicate that they might not have had any training to use the digital platforms. Literacy is also essential among ICT users, and since a large proportion of Turkish deaf people are categorized as illiterate, a greater obstacle in taking ICT into use could exist. Furthermore, deaf people in Turkey have lower education than the wider population (Tufan & Arun, 2006), and it could be suggested that deaf people have a lower ICT-level compared with the majority. Nevertheless, deaf people could have higher adoptive rates because they are highly dependent on using ICT's, resulting in a more comprehensive experience rate in some ICT compared with the majority population in Turkey.

The difference between the ICT-scores among the two countries was significant. The difference in digital skills in Norwegian deaf people and Turkish deaf

people is consistent with the OECD report and overview of digital skills and well-being in the OECD countries (OECD, 2019). The OECD stated that Norway is among the elite in digital skills, whereas Turkey has substantially lower digital skills than the average of the OECD member countries. Additionally, the penetration of ICT in daily life in Norway is high compared with Turkey. The Norwegian government's commitment and success in increasing digital usage and digital information online support the findings that the Norwegian sample had more experience because the population depends on using digital services in daily life. The significant difference in ICT-scores could also be explained by deaf people in Norway having a significantly higher education level compared with Turkish deaf people, where the mean ICT-score would increase by 10.95 if the education level increased by one. Similarly, deaf people in Norway have higher literacy skills compared with Turkish deaf, which, as mentioned, is an essential part of being able to use ICT (Polat, 2012; Tufan & Arun, 2006; Warnicke, 2019).

Both samples had the most experience in the areas of communication and information sharing and information assessment, especially assessing the safety of publishing information on the Internet. This finding is inconsistent with the findings from the Norwegian population, where 20% of the participants reported having little to no experience in assessing the safety of publishing information in social media (Skills Norway, 2018). Considerations of safety and sharing information online have been addressed by many (LaRose & Rifon, 2007; Shillair et al., 2015), and several educational interventions online have been used to increase awareness worldwide (Holmes, 2009). Findings in the present study might indicate that primary forms of understanding of safety are becoming common knowledge in the deaf community. However, as safety online is an ongoing issue today (LaRose & Rifon, 2007; Tsai et al., 2016), assessing safety when publishing online does not cover all aspects of being safe online.

Another ICT deaf people are experienced in is sending or receiving SMS/MMS and participating in network societies such as Facebook or Twitter. These

findings are consistent with previous research in the rest of the deaf population around the world of replacing deaf specific technology (Garberoglio et al., 2015; Maiorana-Basas & Pagliaro, 2014). Skills Norway found the same results in the Norwegian population, where one of the highest rates of ICT experience was in sending or receiving SMS/MMS (Skills Norway, 2018). Deaf young adults have reported that being online hides their identity as deaf, and represents some kind of freedom that ties in the identity of being deaf (Bowker & Tuffin, 2002). Additionally, the deaf community is rather small compared with the majority population and often spread over long distances. With technology, it is now possible to communicate with others even though they live far apart. To keep in touch with others in the deaf community, they are often dependent on texting, using digital platforms, and participating in network societies. This would result in high usage and considerable experience in using this category of ICT.

The results of the present study showed that the lowest scores were in information management, creating new information, and integration of information. These forms of ICT are highly dependent on writing text, such as writing and editing text in word processors, or composing electronic information. As the written language is considered as a second language in the deaf community, using ICT within these areas of digital skills might be more difficult compared with those having the written language as a first language. However, the results are similar to the experiences of the majority in Norway, where one of the lowest scores is in participating in cooperation- and projects online (Skills Norway, 2018). Some might argue that deaf people lack experiences in some areas of ICT due to a lack of universal design of ICT. A survey done by Statistics Norway found that 72% of the governmental agencies had an ICT- or digitization strategy. However, only 55% of the agencies had universal design as a part of their strategy (Bufdir, n.d.). As mentioned, deaf people with sign language as a first language may find it hard or impossible to use ICT that developers designed in a way that is difficult to be interpreted into sign language.

Not being born deaf was found to give a mean change in ICT-score of -14.324.

With only 11 participants (three in Turkey and eight in Norway) reported having not been born deaf, the findings might be a result of chance, not an actual finding. Furthermore, this thesis did not take into consideration when the participant became deaf; late in life, or early in life. However, all have sign language as a preferred language, and it would be reasonable to believe they became deaf when learning sign language was essential, i.e., when younger. It is difficult to conclude, as the results could be different if the sample of signers was larger, and should be further explored.

6.1.2 m-Health usage among deaf adults

Despite the commitment and development of e- and m-Health by the Norwegian government, few Norwegian deaf people took it into use. There was no significant association in ICT-score and contacting a doctor or doctor's office using a smartphone. Previous studies have shown that technology acceptance is highly associated with the adoption of m-Health applications (Mohamed et al., 2011; Zhang et al., 2017). Moreover, another study has also shown that digital skills are associated with technology acceptance (Zaidi et al., 2015). Thus, it is reasonable to believe that a higher ICT-score would be associated with using a smartphone to contact the doctor's office.

Furthermore, there is a significant difference in ICT-scores and education among the sample of deaf people in Norway and Turkey, but no difference in m-Health usage between the groups. Ryan and Kushalnagar (2018) also found that higher education is significantly associated with electronic communication with a health care provider. The study evaluated individuals using American sign language, and the availability of m-Health is high in the United States (Dwivedi et al., 2016).

Digitization in health care in Norway has had rapid growth in the last years (The Norwegian Directorate of eHealth, 2020). However, it could be that m-Health applications to communicate with health care providers are a rather new technology in Norway, and the distrust due to lack of complete information might withhold deaf people from taking this kind of ICT into use. Even though

governmental agencies have made it possible to communicate by writing text in their digital health services (The Norwegian Directorate of eHealth, 2020), there are no specific guidelines available when there is a need to use an interpreter. Furthermore, applications such as HelseRespons ^{TM} have a policy of charging a small amount of money with every SMS delivered and received by the company (Helserespons, n.d), and private health services charge a higher payment as insurances do not cover it. The fact that there is a lack of available information when there is a need to use sign language, and that communicating online with private health care providers require resources in terms of capital, can have an impact on whether or not deaf people would use m-Health to communicate with a doctor.

There was a statistically significant difference in contacting a doctor or doctor's office using a smartphone between genders, where more men in Turkey reported having used this type of application. Research has shown that women feel less confident and more anxious about using ICT compared with males (He & Freeman, 2019), which could explain the results. However, the difference in contacting the doctor might also be based on social roles in masculinity and femininity, as the culture in Turkey regarding differences in men and women might be stronger than in Norway (Özkan & Lajunen, 2005). In Norway, where the roles are somewhat blurred, there was found no difference in using a smartphone to contact a doctor.

Additionally, a higher ICT-score increased the likeliness of sharing information about your health by smartphone. Previous studies have concluded that low digital skills result in sharing private information online (Kralj et al., 2016; Litt & Hargittai, 2014a, 2014b). However, these studies evaluated sharing personal information on social media. Both the Norwegian sample and the Turkish sample in the present study had extensive experience in assessing the safety of publishing information on the Internet. However, having the experience of assessing safety before publishing might not correlate to making the right decisions regarding safety. Arguably, both the Norwegian sample and the Turkish sample have some kind of understanding of safety online as they have

some awareness regarding the issue. A high ICT-score would enable deaf people to share information about their health behind a secure wall, such as using a bank-ID to log in to an official web page or app, and have the skills necessary to do so.

Higher ICT-score was found to increase the odds of having an app related to health. As mentioned earlier, those who do not have high digital skills are not as likely to adopt new technologies as those who do have high digital skills. Moreover, people with high education are associated with better health early in life, and these individuals give more attention to their health than poorly educated people (Conti et al., 2010). Individuals utilize an app only when they perceive it as useful and easy to use (Zhang et al., 2017). Hence, those with low ICT-scores might have difficulties in mastering the health app and do not perceive it as useful, resulting in not using the app.

Age had a significant association between ICT-score and having an app related to health. Youths in developed countries are considered digital natives as they are exposed to different kinds of technologies much earlier than most adults (Prensky, 2001). Prensky (2001) states that as a result of early exposure to technology, young people are comfortable in exploring and using different technologies, and they know how to work on problem-solving and interact with each other. The significant association in the present study could be due to younger people being more comfortable using health-related applications. A study exploring youths' views on health applications revealed that the study participants considered apps and wearable devices as positive and educational health resources in their lives (Goodyear & Armour, 2018), which also can imply for younger deaf adults. However, in the present study, had all the results regarding m-Health rather wide 95% confidence intervals. A more extensive study is needed to generate a more precise estimate of effect.

6.2 Methodology discussion

6.2.1 Strengths and limitations of the study

This is one of the first studies to evaluate digital skills among deaf people, comparing a high-income and middle-income country, where also recognition of sign language and deaf culture differs. The mean age in the study sample is higher than previous research on deaf people and ICT, which can give new information about the needs of elderly deaf adults. The deaf community as a minority often feels misunderstood and marginalized because of cultural and language barriers. The feeling of misunderstanding and marginalization may be caused by an under-representation of health researchers who understand their cultural values. Researchers often refer to deaf people as ”*disabled*” or as ”*patients*”, which does not comply with their conception of deafness (McKee et al., 2013). The present study is performed by someone who knows the deaf community, and the study's purpose was, as opposed to other research, to study a minority group rather than a patient group. The research has been carried out with the best intentions, and everything possible has been done to validate and conduct proper research with the resources available. Although the research might be an essential addition to the literature, note there are several limitations of the study.

The resources available in Turkey were limited. There was a need to change interpreter several times due to language barriers. The interpreters worked voluntarily and had no training in being a translator. There was no certainty if what was translated from English to Turkish was their understanding or the exact words of what the master student explained or said. Similarly, there were no interpreters available to translate from oral English to Turkish sign language. It was therefore interpreted in three stages, from Norwegian to English, from English to Turkish, and Turkish to Turkish sign language. It is possible that the information and answers to questions could be interpreted differently between the stages and told differently to the participants. However, meeting deaf people face to face with an interpreter available made sure that

there was limited missing data from the respondents. Posting or emailing the questionnaire would have resulted in reaching a broader population. However, sending the questionnaire by mail could also lead to more missing data from those who chose to participate in the study.

Due to political conflicts between Turkey and Syria causing the student to leave early, and Covid-19 pandemic in Norway, both data collections were shortened, and a smaller sample size was obtained than planned initially. The small size limited the possibility for generalization of the findings. A small sample size can have consequences for the research because a bias can occur as a result of a small sample size (Bland, 2015). Nonetheless, an evaluation of the sampling during collection showed there were small variations in the individual results. Even though the study used a pen-to-paper questionnaire not to exclude those with low digital skills, the study was dependent on voluntary participation. A common consequence of voluntary participation is that those with high digital skills will be more likely to participate than those with low digital skills. This serves an over-representation of individuals having high digital skills, and resulting in selection bias. Furthermore, the number of younger adults in the age of 18-24 was limited in this study, which could result in a lower median overall ICT-scores in the samples. An explored determinant of digital skills is living in an urban area vs. in a rural area (Polat, 2012). This study included only samples from urban areas, and the results could be different if the study also included deaf people from rural areas.

Additionally, validity and reliability tests of the questionnaire were not done due to the scope of the thesis. I am aware that to validate the translated questionnaire from English to Turkish, should have been translated back and forth to validate the translation and the language. Moreover, Skills Norway has not been able to validate the translation, and the questionnaire had to be used as it is with its limitations.

6.2.2 Validity and reliability of the instruments and questionnaire

The ICT-score in the Turkish sample was checked for outliers as the data were non-normally distributed. Several conditions can cause outliers: data entry or measurement errors, sampling problems, unusual conditions, and natural variation (Osborne & Overbay, 2004). The data were explored to detect causes, and it was concluded that data entry or measurement errors did not cause the extreme values. Neither made a sampling error, as the individuals had the proper sociodemographic variables fitting the inclusion criteria. A large variation in the sample would result in a lower statistical power, e.g., removing the outliers would intensify the substantial differences in ICT-score and ICT-level between Norwegian deaf people and Turkish deaf people. However, the conclusion was that natural variations caused the outliers. Removing extreme values exclusively due to their extremeness could make the data misrepresented of the actual variability in the study (Osborne & Overbay, 2004). Thus, the conclusion was not to remove them.

Crohnbach's Alpha was used to assess the internal consistency of the questionnaire. The alpha coefficient was .977 when assessing digital skills items, suggesting a high internal consistency within the scale. However, a very high value, some might say over .95, indicate some redundancy in the scale. If the items are very highly correlated, one might not need them (Bland, 2015). m-Health-related items had an alpha value of .73. If the alpha value is low, the items will not be coherent, and the scale will not necessarily be a reasonable estimate of the construct. However, several researchers have discussed the actual cutoff-point of an acceptable lower value. Some argue that the critical value in research should be higher than .8 to conclude an acceptable consistency, and others argue an alpha value of .7 or higher are considered acceptable (Bland, 2015). A low alpha value could be due to a low number of questions, and one way to increase the alpha value is by adding more items. An increased alpha value is also reached by dropping not highly correlated items (Bland, 2015). There were three m-Health-related questions in the questionnaire, which could be considered rather low, and adding more items could have resulted in a higher

correlation value. However, if a low alpha value was due to a weak correlation between items, the questions should be revised or discarded (Bland, 2015).

A measure of avoiding under- or overestimation of the participants' own digital skills was taken by asking how much experience the participants had in performing different tasks using ICT rather than self-rated self-efficacy in using ICT. It is questioned by Daus et al. (2019) if the use of experience as a measurement reflects the quality of usage or mastery in the tasks that are measured. Additionally, there is a risk that measurements of digital participation and digital skills are being mixed and not properly separated (Daus et al., 2019). However, even though experience (digital participation) does not always correlate with mastery in performing different ICT tasks (digital skills), it is argued that a high experience rate would reflect a high adoptive rate in new technologies (Daus et al., 2019; Skills Norway, 2018). One way to obtain a valid and complete measurement of digital skills is by performance tests of computer and Internet tasks (van Deursen & van Dijk, 2009). However, this method takes time and extensive resources (Daus et al., 2019), which made it an unfeasible method due to the scope of the study.

Even though the eight areas of skills hold some of the international definitions and frameworks of digital skills, the questionnaire has some limited understanding of safety and judgment in the digital platforms, which are becoming even more critical in the development of ICT (Daus et al., 2019; Skills Norway, 2011). Skills Norway has developed their questionnaire continuously with the development of ICT, and the different tasks the participants are rating their experience in are not the same in 2018 as they were in 2012. The present study used an older issue of the questionnaire to ensure the technologies were thoroughly integrated into both countries. The development and availability of ICT might differ between the two nations. It is not necessarily the case that the self-rated experience in tasks such as "*Using a CD-ROM*" or *"Using bank-ID"* reflects differences of digital skills, but rather the differences in development, trends, and availability of ICT in the two countries.

7 Conclusion

In an ever-developing information society where digital health service has rapid growth, being able to use m-Health is essential. This is particularly important in the deaf community, as deaf people often experience difficulties when approaching health care services. This thesis's purpose was to investigate the level of digital skills and the use of m-Health in the deaf community as a minority group rather than focusing on deaf people as patients or disabled.

This exploratory cross-sectional comparative study suggests that digital skills have an association between having an application related to health and sharing information about their health by smartphone, but not in contacting a doctor or doctor's office by using a smartphone. The study found a difference in digital skills between deaf adults in Turkey and Norway, and similarities in experiences in the different ICT-areas. The similarities in ICT-areas are possibly due to similarities in deaf people's characteristics, for example, that the written language is considered a second language. The sample had extensive experiences in safety assessment and using different communication tools and limited experiences in ICT-tasks that require high literacy skills.

Many findings in the present study are consistent with previous studies regarding technology usage and digital skills in Norway and Turkey. However, even though there was a significant educational difference between the two samples and differences in digital skills, there was no significant difference in m-Health usage. As Norwegians widely accept m-Health applications, it is argued that m-Health applications to communicate with health care providers are not developed in such a way that deaf people perceive them as useful.

The findings in this study may serve as a motivator for research on ICT and digital skills, and a guide and a call to attract more research in this area among deaf people worldwide.

8 Future research

Given the widespread nature of digital skills and m-Health, additional research is needed to clarify the relationship between digital skills and m-Health among deaf adults. The present study had small samples, which could limit the generalization of the findings. Also, additional research is needed to estimate the precise effects of digital skills and m-Health utilization. Using a questionnaire is highly efficient and requires fewer resources than ICT-tests. However, there is a need to establish a measurement instrument that provides a clear evaluation of digital skills, and that takes into account that ICT-trends and development differ between nations to present exact differences in digital skills between countries.

Further research should be performed comparing other countries, e.g., high human development index countries. This could provide evidence of differences in ICT learning and m-Health accessibility among deaf people where recognition of sign language is somewhat alike. m-Health utilization among deaf adults in both Norway and Turkey was low. Investigations to detect causes of low usage, and implementing changes, is necessary to include deaf people in health communication applications.

References

Alexander, A., Ladd, P., & Powell, S. (2012). Deafness might damage your health. *The Lancet*, *379*(9820), 979–981.

Al-Sarayrah, W., Al-Aiad, A., & Jararweh, Y. (2018). 2018 ieee/acs 15th international conference on computer systems and applications (aiccsa), 1–5.

Andersen, S., & Trengereid, S. (2016). Digitale ressurser for struktur og organisering. StatpedMagasinet.

Bakken, F. (2005). Sms use among deaf teens and young adults in norway, In *The inside text*. Springer, Dordrecht.

Berhove, M. (2018). *Uttalelse - ekspertgruppen for barn og unge med behov for særskilt tilrettelegging*. http://doveforbundet.no/sites/default/files/uttalelse_-_ekspertgruppen_for_barn_og_unge_med_behov_for_saerskilt_tilrettelegging_2.pdf

Bland, M. (2015). *An introduction to medical statistics (4th edition)*. Oxford University Press.

Bourgeois, A., Birch, P., & Davydovskaia, O. (2019). Digital education at school in europe. eurydice report. *Education, Audiovisual and Culture Executive Agency, European Commission*.

Bowker, N., & Tuffin, K. (2002). Disability discourses for online identities. *Disability & Society*, *17*(3), 327–344.

Brečko, B., & Ferrari, A. (2016). The digital competence framework for consumers. *Joint Research Center (JRC) Science for Policy Report, EUR28133EN*.

Bufdir. (n.d.). *Levekårsstatus for personer med nedsatt funksjonsevne - ikt og digital deltakelse*. Retrieved May 12, 2020, from https://bufdir.no/Statistikk_og_analyse/Nedsatt_funksjonsevne/ikt/

Çayhan, B. E. (2008). Implementing e-government in turkey: A comparison of online public service delivery in turkey and the european union. *The Electronic Journal of Information Systems in Developing Countries*, *35*(1), 1–11.

Conti, G., Heckman, J., & Urzua, S. (2010). The education-health gradient. *American Economic Review*, *100*(2), 234–38.

Daus, S., Fevolden, A. M., Østby, M. N., & Mark, M. S. (2019). Indikatorer for digital deltakelse og kompetanse i den voksne befolkningen - vurderinger av rammeverk, eksisterende datakilder og nye indikatorer.

De Meulder, M., Murray, J. J., & McKee, R. L. (2019). *The legal recognition of sign languages: Advocacy and outcomes around the world*. Multilingual Matters.

Doganyigit, S., & Yilmaz, E. (2015). Mobile health applications user trends in turkey. *Journal Mass Commun*, *5*(1), 44–49.

Duplaga, M. (2017). Digital divide among people with disabilities: Analysis of data from a nationwide study for determinants of internet use and activities performed online. *PloS one*, *12*(6).

Dwivedi, Y. K., Shareef, M. A., Simintiras, A. C., Lal, B., & Weerakkody, V. (2016). A generalised adoption model for services: A cross-country comparison of mobile health (m-health). *Government Information Quarterly*, *33*(1), 174–187.

Eide, A. H., Gundersen, T., & Landsforbund, H. (2004). Hørselshemmede og arbeid. *Sintef-rapport*.

European training foundation. (2018). Digital skills and online learning in turkey: Summary fact sheet.

Faiola, A., & Holden, R. J. (2017). Consumer health informatics: Empowering healthy-living-seekers through mhealth. *Progress in cardiovascular diseases*, *59*(5), 479–486.

Fellinger, J., & Kuenburg, A. (2011). Steps forward to health care for deaf people worldwide.

Ferrari, A. (2012). Digital competence in practice: An analysis of frameworks.

Ferrari, A. (2013). Digcomp: A framework for developing and understanding digital competence in europe.

Forbrukerrådet. (2018). *Forbrukertrender 2018 - del 1 digital helsehverdag*. https : / / fil . forbrukerradet.no/wp-content/uploads/2018/04/20180417-ke-digital-helse-rapport.pdf

Garberoglio, C. L., Dickson, D., Cawthon, S., & Bond, M. (2015). Bridging the communication divide: Cmc and deaf individuals´ literacy skills. *Language learning & Technology*, *19*(2), 118–133.

Goggin, G. (2016). Disabilities and digital inequalities: Rethinking digital divides with disabiliy.

Goodyear, V. A., & Armour, K. M. (2018). Young people's perspectives on and experiences of health-related social media, apps, and wearable health devices. *Social Sciences*, *7*(8), 137.

Gravdahl, B., & Guthu, L. (2008). Borger og bruker. en analyse av den norske befolkningens digitale kompetanse.

Guthu, L., & Lønvik, K. (2011). Fremdeles mange som står igjen: Digital kompetanse i befolkningen.

Hazar, E. (2018). Digital competence in primary education: The case of turkish language, mathematics and personal and social development courses. *Online Submission*, *5*(2), 443–458.

He, J., & Freeman, L. A. (2019). Are men more technology-oriented than women? the role of gender on the development of general computer self-efficacy of college students. *Journal of Information Systems Education*, *21*(2), 7.

Health Information National Trends Survey. (n.d.). *Hints 5 cycle 1 survey instrument (english)*. Retrieved June 15, 2019, from https://hints.cancer.gov/docs/Instruments/HINTS5_Cycle1_Annotated_Instrument_English.pdf

Helserespons. (n.d). *Helserespons*. Retrieved February 20, 2020, from https://helserespons.no/home/privatperson

Holmes, J. (2009). Myths and missed opportunities: Young people's not so risky use of online communication. *Information, Communication & Society*, *12*(8), 1174–1196.

Huth, M., Vishik, C., & Masucci, R. (2017). From risk management to risk engineering: Challenges in future ict systems, In *Handbook of system safety and security*. Elsevier.

Ilkbaşaran, D. (2015). Social media practices of deaf youth in turkey: Emerging mobilities and language choice. *It'sa Small World: Inquiries into International Deaf Spaces*, 112–124.

Ilomäki, L., Kantosalo, A., & Lakkala, M. (2011). What is digital competence. *Linked portal. Brussels: European Schoolnet (EUN)*, 1–12.

Ilomäki, L., Paavola, S., Lakkala, M., & Kantosalo, A. (2016). Digital competence–an emergent boundary concept for policy and educational research. *Education and Information Technologies*, *21*(3), 655–679.

ITU. (2018). *Measuring the information society report 2018*. International Telecommunications Union.

Johansen, S. T. (2020). *Færre med nedsatt hørsel tar høyere utdanning*. Retrieved May 15, 2020, from https://www.dinhorsel.no/faerre-med-nedsatt-hoersel-tar-hoeyere-utdanning.6289626-460100.html

Kemaloğlu, Y. K., & Kemaloğlu, P. Y. (2012). The history of sign language and deaf education in turkey. *Kulak Burun Boğaz İhtisas Dergisi*, *22*(2), 65–76.

Kralj, L. Et al. (2016). E-safety and digital skills as part of school curriculum. *Medijske studije*, *7*(13), 59–75.

Krebs, P., & Duncan, D. T. (2015). Health app use among us mobile phone owners: A national survey. *JMIR mHealth and uHealth*, *3*(4), e101.

Kuenburg, A., Fellinger, P., & Fellinger, J. (2016). Health care access among deaf people. *The Journal of Deaf Studies and Deaf Education*, *21*(1), 1–10.

LaRose, R., & Rifon, N. J. (2007). Promoting i-safety: Effects of privacy warnings and privacy seals on risk assessment and online privacy behavior. *Journal of Consumer Affairs*, *41*(1), 127–149.

Litt, E., & Hargittai, E. (2014a). A bumpy ride on the information superhighway: Exploring turbulence online. *Computers in Human Behavior*, *36*, 520–529.

Litt, E., & Hargittai, E. (2014b). Smile, snap, and share? a nuanced approach to privacy and online photo-sharing. *Poetics*, *42*, 1–21.

Maiorana-Basas, M., & Pagliaro, C. M. (2014). Technology use among adults who are deaf and hard of hearing: A national survey. *Journal of deaf studies and deaf education*, *19*(3), 400–410.

Martínez-Pérez, B., De La Torre-Dı´ez, I., & López-Coronado, M. (2013). Mobile health applications for the most prevalent conditions by the world health organization: Review and analysis. *Journal of medical Internet research*, *15*(6), e120.

McKee, M., Schlehofer, D., & Thew, D. (2013). Ethical issues in conducting research with deaf populations. *American journal of public health*, *103*(12), 2174–2178.

Minocha, S., McNulty, C., & Evans, S. (2015). Imparting digital skills to people aged 55 years and over in the uk.

Mohamed, A. H. H., Tawfik, H., Al-Jumeily, D., & Norton, L. (2011). Mohtam: A technology acceptance model for mobile health applications, In *2011 developments in e-systems engineering*. IEEE.

Morris, M., Saunders, D., & Iantaffi, A. (2017). Intersectional and intermodal: Making sexual health information accessible to lgbtq+ deaf people.

Norges Døveforbund. (n.d.). *Om tegnspråk*. Retrieved February 3, 2020, from https://www.doveforbundet.no/tegnsprak/hva

Norges Døveforbund, Foreningen Norges døvblinde, Landsforbundet for kombinert syns- og hørselshemmede/døvblinde, & Hørselshemmedes Landsforbund. (2019). *Veikart til en ny nasjonal tolketjeneste*. https://www.doveforbundet.no/sites/default/files/veikart_til_en_ny_nasjonal_tolketjeneste.pdf

NOU 2019:2. (2019). Fremtidige kompetansebehov ii -utfordringer for kompetansepolitikken.

OECD. (2019). *How's life in the digital age? opportunities and risks of the digital transformation for people's well-being: Opportunities and risks of the digital transformation for people's well-being*. OECD Publisher.

OpenSignal. (n.d.). *The state of lte (february 2018)*. Retrieved October 15, 2019, from https://www.opensignal.com/reports/2018/02/state-of-lte

Osborne, J. W., & Overbay, A. (2004). The power of outliers (and why researchers should always check for them). *Practical Assessment, Research, and Evaluation*, *9*(1), 6.

Özkan, T., & Lajunen, T. (2005). Masculinity, femininity, and the bem sex role inventory in turkey. *Sex Roles*, *52*(1-2), 103–110.

Paschou, M., Sakkopoulos, E., & Tsakalidis, A. (2013). Easyhealthapps: E-health apps dynamic generation for smartphones & tablets. *Journal of medical systems*, *37*(3), 9951.

Polat, R. K. (2012). Digital exclusion in turkey: A policy perspective. *Government information quarterly*, *29*(4), 589–596.

Prensky, M. (2001). Digital natives, digital immigrants. *On the horizon*, *9*(5).

Ragnedda, M. (2017). *The third digital divide: A weberian approach to digital inequalities*. Taylor & Francis.

Redecker, C., & Punie, Y. (2017). Digital competence of educators digcompedu. *Luxembourg: Publications Office of the European Union*.

Romero, R. L., Kates, F., Hart, M., Ojeda, A., Meirom, I., & Hardy, S. (2019). Quality of deaf and hard-of-hearing mobile apps: Evaluation using the mobile app rating scale

(mars) with additional criteria from a content expert. *JMIR mHealth and uHealth*, *7*(10), e14198.

Ryan, C., & Kushalnagar, P. (2018). Towards health equity: Deaf adults' engagement in social e-health activities and e-communication with health care providers. *Journal of health communication*, *23*(9), 836–841.

Sari, H., & Pürsün, T. (2018). An analysis of deaf students' perceptions about usage of information and communication technologies for their education. *Turkish Special Education Journal: International*, *1*(2), 36–59.

Shillair, R., Cotten, S. R., Tsai, H.-Y. S., Alhabash, S., LaRose, R., & Rifon, N. J. (2015). Online safety begins with you and me: Convincing internet users to protect themselves. *Computers in Human Behavior*, *48*, 199–207.

Skills Norway. (2011). *Methodology - digital competence analysis*. Retrieved June 20, 2019, from https://www.kompetansenorge.no/methodology/digitalcompetence

Skills Norway. (2018). *Grunnleggende digitale ferdigheter*. Retrieved December 6, 2019, from https : / / www . kompetansenorge . no / statistikk - og - analyse / grunnleggende - digital - ferdigheter/grunnleggende-digitale-ferdigheter-i-befolkningen/#ob=23871,23100

Söderström, S. (2015). Teknologibruk i den digitale enhetsskolen.

Sonck, N., Livingstone, S., Kuiper, E., & de Haan, J. (2011). Digital literacy and safety skills.

Statistics Norway. (2019). *Befolkningens utdanningsnivå*. Retrieved June 16, 2020, from https: //www.ssb.no/utniv/

The Norwegian Directorate of eHealth. (2020). *Utviklingstrekk 2020 - drivere og trender for e-helseutviklingen*.

Ting, D. S. W., Carin, L., Dzau, V., & Wong, T. Y. (2020). Digital technology and covid-19. *Nature medicine*, *26*(4), 459–461.

Tsai, H.-y. S., Jiang, M., Alhabash, S., LaRose, R., Rifon, N. J., & Cotten, S. R. (2016). Understanding online safety behaviors: A protection motivation theory perspective. *Computers & Security*, *59*, 138–150.

Tufan, İ., & Arun, Ö. (2006). Türkiye özürlüler araştırması 2002 ikincil analizi. *Proje No: SOBAG-104K077, Sosyal ve Beşeri Bilimler Araştırma Grubu, Türkiye Bilimsel ve Teknik Araştırma Kurumu, Ankara, Ocak*.

UNESCO. (2018). *Digital skills critical for jobs and social inclusion*. Retrieved March 19, 2020, from https://en.unesco.org/news/digital-skills-critical-jobs-and-social-inclusion

Van Dijk, J. (2005). *The deepening divide: Inequality in the information society*. Sage Publications.

van Deursen, A. J., & Helsper, E. J. (2015). The third-level digital divide: Who benefits most from being online?, In *Communication and information technologies annual*. Emerald Group Publishing Limited.

van Deursen, A. J., & van Dijk, J. A. (2009). Improving digital skills for the use of online public information and services. *Government Information Quarterly*, *26*(2), 333–340.

van Dijk, J. (2012). The evolution of the digital divide: The digital divide turns to inequality of skills and usage. *Digital enlightenment yearbook*, *2012*, 57–75.

van Laar, E., van Deursen, A. J., van Dijk, J. A., & de Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in human behavior*, *72*, 577–588.

Warnicke, C. (2019). Equal access to make emergency calls: A case for equal rights for deaf citizens in norway and sweden. *Social Inclusion*, *7*(1), 173–179.

Weiss, D., & Eikemo, T. A. (2017). Technological innovations and the rise of social inequalities in health. *Scandinavian journal of public health*, *45*(7), 714–719.

WHO. (2018). Mhealth. use of appropriate digital technologies for public health: Report by director-general. *Seventy-first world health assembly provisional agenda item 12.4*.

WHO. (2020). *Deafness and hearing loss*. Retrieved March 19, 2020, from https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss

World Federation of the Deaf. (2019). Wfd position paper on the complementary or diametrically opposed: Situating deaf communities within 'disability' vs cultural and linguistic minority' constructs.

World Summit on the Information Society. (2003). Declaration of principles- building the information society: A global challenge in the new millennium [document wsis-03/geneva/doc/4-e].

Zaidi, S. K., Gupta, G., Udo, G., & Bagchi, K. (2015). The influence of theory of planned behavior, technology acceptance model, and information system success model on the acceptance of electronic tax filing system in an emerging economy.

Zhang, X., Han, X., Dang, Y., Meng, F., Guo, X., & Lin, J. (2017). User acceptance of mobile health services from users' perspectives: The role of self-efficacy and response-efficacy in technology acceptance. *Informatics for Health and Social Care*, *42*(2), 194–206.

Appendix 1: Questions retrieved from the original survey from Skills Norway

1. Defining information needs - Using ICT to identify and define information needs

1) *determining what kind of information you need and that can possibly be retrieved using a computer/the internet, for example pertaining or common tasks like shopping, travel and contact with governmental agencies*

2. Access to information - Knowing how and where to find and collect information with the aid of ICT

2) *using search engines on the internet (e.g. Google, Yahoo, etc.)*
3) *locating websites that contain the information you need*
4) *obtaining an overview and navigating on a website?*
5) *finding specific information that you need on the websites of government agencies?*
6) *finding websites in a language other than Norwegian/Turkish?*

3. Technological self-reliance- Undertaking technological operations independently

7) *creating an e-mail address independently?*
8) *being able to install programs on the computer independently?*
9) *using a program from a CD-ROM?*
10) *using and update anti-virus software?*
11) *opening computer programs independently?*

4. Information management - Sorting and organizing information

12) *select information one needs from the internet?*
13) *organizing and storing files in one's computer, so that they can be easily retrieved?*
14) *being able to organize the information found, for example by arranging it into lists or tables?*
15) *being able to transfer figures from a spread sheet to a different program and vice versa?*

5. Information assessment - Assessing the quality, relevance and usefulness of the information, as well as internet safety

16) *assessing the quality of the information that you find on the internet, for example whether it is old, biased or untrustworthy?*
17) *assessing the safety of publishing information on the internet, for example on Facebook, in chat rooms, etc..?*

6. Integration of information - Interpreting, summarizing and comparing information through

different forms of presentations

18) *writing, editing and transferring text in word processors?*
19) *using spell checkers/dictionaries?*
20) *inserting images/symbols in word processors?*
21) *inserting and editing tables in word processors?*
22) *using drawing/graphics applications, for example Power Point?*

7. Communication and information sharing - Sharing and exchanging information and knowledge with the aid of ICT

23) *sending/receiving SMS/MMS messages from a mobile phone?*
24) *connecting to the internet using a mobile phone?*
25) *sending/receiving e-mail?*
26) *sending attachments (files) with e-mails?*
27) *using e-mail/calendar systems to organize/arrange meetings?*
28) *ordering/purchasing tickets over the internet?*
29) *entering information by using a net-based template, for example electricity meter reading, etc.?*
30) *buying or selling goods through Norwegian/Turkish websites?*
31) *buying or selling goods through websites in other languages than Norwegian/Turkish?*
32) *using IP telephony or Skype?*
33) *using a digital signature?*
34) *participating in network societies, for example Facebook or Twitter?*
35) *reading and/or commenting on a blog?*
36) *participating in cooperation and project groups over the internet?*

8. Creating new information - Creating and presenting new information with the aid of ICT

37) *composing information that you have found, being able to present it to others electronically?*

Appendix 2: Information letter and questionnaire, Norway

Vil du delta i forskningsprosjektet

"Digital kompetanse og bruken av m-Helse applikasjoner til å kontakte helsepersonell blant døve i Norge og Tyrkia"?

Dette er et forespørsel til deg om å delta i et forskningsprosjekt hvor formålet er å kartlegge digital kompetanse og bruken av smarttelefon til å kontakte helsepersonell**.** I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål
Forskningsprosjektet er et prosjekt i masteroppgaven min i Global Health ved NTNU i Trondheim som utføres fra høst 2019 til vår 2020.

Studien skal kartlegge den digitale kompetansen blant døve i Norge og i Tyrkia og se om den digitale kompetansen har en innvirkning på bruken av m-Helse applikasjoner til kommunikasjon med helsepersonell. Studien skal også se om det er forskjeller på digital kompetanse og bruken av apper relatert til helse på mobilen blant døve i Norge og i Tyrkia.

Digital kompetanse handler om hvordan man behersker bruk av PC og mobiltelefon. Jeg har en bakgrunn i døve- og tegnspråkmiljøet i Norge og er interessert i tilgangen til og bruken av smarttelefon, datamaskin og informasjonsteknologi ettersom dette kan være veien videre til et mer inkluderende og tilgjengelig samfunn for alle.

Resultatet fra studien blir publisert i masteroppgaven, og eventuelt i en artikkel.

Hvem er ansvarlig for forskningsprosjektet?
Masterstudent Birthe Frafjord og Professor Sigrid Nakrem ved Det medisinske fakultet ved Norges Tekniske og Naturvitenskapelige Universitet (NTNU).

Hvorfor får du spørsmål om å delta?
Du har fått spørsmål om å delta siden du bruker tegnspråk og er mellom 18-64 år gammel.

Hva innebærer det for deg å delta?

- Hvis du velger å delta i prosjektet, innebærer det at du fyller ut et spørreskjema. Det vil ta deg ca. 20 minutter. Spørreskjemaet inneholder spørsmål om deg, en evaluering av digital kompetanse og bruken av smarttelefon og apper.

Det er frivillig å delta
Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke deg uten å oppgi noen grunn. Alle opplysninger om deg vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger
Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

- De som vil ha tilgang til opplysningene er student og veileder.
- Navnet og kontaktopplysningene dine vil jeg erstatte med en kode som lagres på en egen navneliste adskilt fra øvrige data.

Studien blir publisert gjennom masteroppgaven. Ved publisering fra studien vil opplysningene bli brukt på en slik måte at du ikke kan gjenkjennes.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?
Prosjektet skal etter planen avsluttes i desember 2020. Ved prosjektslutt skal personopplysninger slettes.

Dine rettigheter
Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Norges tekniske og naturvitenskapelige universitet har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

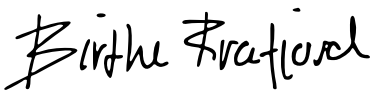
Hvor kan jeg finne ut mer?
Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- Norges tekniske og naturvitenskapelige universitet ved Sigrid Nakrem, sigridnakrem@ntnu.no, og Birthe Frafjord, birthef@student.ntnu.no eller telefon 92404490.
- Vårt personvernombud: Thomas Helgesen, thomas.helgesen@ntnu.no.
- NSD – Norsk senter for forskningsdata AS, på epost (personverntjenester@nsd.no) eller telefon: 55 58 21 17.

Med vennlig hilsen

Prosjektansvarlig
(Forsker/veileder)

Student



Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet *Digital kompetanse og bruken av m-Helse applikasjoner til å kommunisere med helsepersonell* og har fått anledning til å stille spørsmål. Jeg samtykker til:

- ☐ å delta i spørreundersøkelsen

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet, desember 2020

(Signert av prosjektdeltaker, dato)

Appendix 3: Questionnaire

Digital kompetanse og bruken av m-Helse til å kommunisere med helsepersonell.

Her krysser du av ett alternativ.

1. Alderen din:

- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64

2. Ditt kjønn:

- Kvinne
- Mann

3. Ditt utdanningsnivå:

- Ingen fullført skole
- Grunnskole
- Videregående skole
- Høyskole/universitet

4. Er du født døv?

- Ja
- Nei

5. Hvilket språk foretrekker du å bruke?

- Tegnspråk
- Norsk
- Begge

4. Hvilket språk foretrekker du å bruke når du er på legekontoret?

- Tegnspråk (direkte eller gjennom tolk)
- Norsk (skriftlig eller muntlig)

Kryss av på tallet som tilsvarer med din erfaring i de ulike oppgavene nedenfor.

0 = ingen erfaring
1 = avgrenset erfaring
2 = en viss erfaring
3 = stor erfaring

Hvor mye erfaring har du med:

7. Definere informasjonsbehov - Å bruke IKT til å identifisere og definere et informasjonsbehov

	0	1	2	3
(a) å finne ut hvilken informasjon du trenger og som du eventuelt kan skaffe ved hjelp av datamaskin/internett, for eksempel i forbindelse med daglige oppgaver som innkjøp, reiser og kontakt med det offentlige?	○	○	○	○

8. Adgang til informasjon - Å vite hvordan og hvor man kan finne og samle informasjon ved hjelp av ikt

(a) å bruke søkemotorer på internett, for eksempel Google, Yahoo m.fl?	○	○	○	○
(b) å finne andre steder på Internett som har den informasjon du trenger?	○	○	○	○
(c) å få oversikt og kunne navigere på en hjemmeside?	○	○	○	○
(d) å finne bestemt informasjon du trenger på det offentliges hjemmesider?	○	○	○	○
(e) å finne bestemt informasjon på hjemmesider med et annet språk enn norsk?	○	○	○	○

9. Teknologisk selvhjulpen - Å gjennomføre teknologiske operasjoner selvstendig

(a) å bruke og å opprette en e-postadresse selv?	○	○	○	○
(b) å kunne installere programmer på datamaskinen selv?	○	○	○	○
(c) å bruke et program fra CD-rom?	○	○	○	○
(d) å bruke og å oppdatere antivirus?	○	○	○	○
(e) å åpne programmer på datamaskinen selv?	○	○	○	○
(g) å opprette en digital signatur?	○	○	○	○

10. Håndtere informasjon – Å sortere og organisere informasjon

(a) å velge ut den informasjonen du har bruk for?	○	○	○	○
(b) organisere og lagre filer på datamaskinen slik at du let finner de igjen?	○	○	○	○
(c) å organisere informasjon, for eksempel ved å lage lister eller tabeller?	○	○	○	○

(d) å flytte tall fra regneark til et annet program eller omvendt?	○	○	○	○

11. Evaluere informasjon/nett-trygghet – Å vurdere informasjonens kvalitet, relevans og anvendelighet, og hva som er trygt å legge ut på nett				
(a) å vurdere kvaliteten på den informasjonen du finner på internett, for eksempel som den er gammel, ensidig eller ikke troverdig?	○	○	○	○
(b) å vurdere hva slags informasjon det er trygt å legge ut på internett, for eksempel på Facebook, chatterom eller andre nettsteder?	○	○	○	○

12. Integrere informasjon – Å fortolke, sammenfatte og sammenligne informasjon gjennom forskjellig former for presentasjoner				
(a) å skrive, redigere og flytte tekst i tekstbehandling?	○	○	○	○
(b) å bruke stavekontroll/ordbøker?	○	○	○	○
(c) å sette inn bilder/symboler i tekstbehandling?	○	○	○	○
(d) å sette inn og redigere tabeller I tekstbehandling?	○	○	○	○
(e) å bruke tegne/grafikkprogrammer, som for eksempel Powerpoint?	○	○	○	○

13. Kommunikasjon og formidling – Å formidle og utveksle informasjon og kunnskap ved hjelp av IKT				
(a) å sende/motta SMS fra en mobiltelefon?	○	○	○	○
(b) å koble deg til Internett på mobiltelefonen?	○	○	○	○
(c) å sende/motta e-post?	○	○	○	○
(d) å sende vedlagte dokumenter (filer) med e-post?	○	○	○	○
(e) å bruke e-post/kalendersystemer for å organisere/avtale møter?	○	○	○	○
(f) å bestille/kjøpe billetter over internett?	○	○	○	○
(g) å taste inn opplysninger til det offentlige, for eksempel ved å bruke en mal som ligger på nettet, selvangivelse, strømavlesning etc.?	○	○	○	○
(h) å kjøpe eller selge varer via norske nettsider?	○	○	○	○
(i) å kjøpe eller selge varer via ikke-norskspråklige nettsider?	○	○	○	○
(j) å bruke IP-telefoni eller Skype?	○	○	○	○
(k) å bruke digital signatur?	○	○	○	○
(l) å delta i et nettsamfunn, for eksempel Facebook eller Twitter?	○	○	○	○
(m) å lese og/eller kommentere en blogg?	○	○	○	○
(n) å delta i samarbeids- og prosjektgrupper på nettet?	○	○	○	○

14. Skape ny informasjon – Å skape og presentere ny informasjon ved hjelp av IKT

(a) å kunne sette sammen informasjon du har funnet, slik at den kan presenteres elektronisk for andre?	○	○	○	○

Kryss av på et av alternativene.

15. I løpet av de siste 12 månedene, har du brukt en smarttelefon til å kommunisere med en lege eller et legekontor?

- ○ Ja
- ○ Nei

16. Har du noen software applikasjoner eller apper relatert til helse på smartbrettet eller smarttelefonen din?

- ○ Ja
- ○ Nei

17. Har du delt informasjon om helsen din med helsepersonell med bruk av app?

- ○ Ja
- ○ Nei

Appendix 4: Information letter and questionnaire, Turkey

"Norveç ve Türkiye'deki işitme engelliler arasında dijital uyum ve sağlık profesyonelleri ile iletişim için mobil sağlık uygulamaları"
İsimli çalışmaya katılmak ister misiniz?

Bu dökümandaki bilgiler dijital uyum ve sağlık profesyonelleri ile iletişime geçmek için akıllı telefonların kullanımına ilişkin bir harita oluşturmak amacıyla gerçekleştirilen araştırma projesine katılımınız için bir istektir. Sizlere projenin amacına yönelik bilgiler verilecek ve katılım göstermenizin sizin için ne anlama geleceği açıklanacaktır.

Amaç
Bu araştırma, Norveç Bilim ve Teknoloji Üniversitesi Global Sağlık Programı'nda güz 2019'dan bahar 2020'ye dek sürecek olan yüksek lisans tezi çalışmamın bir parçasıdır.

Çalışma Norveç ve Türkiye'deki işitme engelliler arasında bir harita oluşturacak ve mobil sağlık uygulamalarının, sağlık profesyonelleri ile iletişimde dijital uyumun bir etkisi olup olmadığına bakılacaktır. Çalışma ayrıca Norveç ve Türkiye'de dijital uyum ve sağlığa yönelik mobil uygulamalar kullanımında farklılık olup olmadığını inceleyecektir.

Dijital uyum bilgisayar ve cep telefonlarını kullanabilme düzeyidir. İşitme engelliler ve işaret dili çevresine ilişkin arkaplana sahibim ve akıllı telefonlara, bilgisayarlara ve bilgi teknolojilerine ulaşabilme ve bunların potansiyel kullanımı konusuyla ilgilenmekteyim çünkü bunlar herkes için daha kapsayıcı ve ulaşılabilir bir toplum oluşturmaya katkı sağlayabilir.

Bu çalışmanın bulguları yüksek lisans tezinde ve muhtemelen bir makalede yayınlanacaktır.

Bu projeden kim sorumlu?
Norveç Bilim ve Teknoloji Üniversitesi Tıp Fakültesi ve Sağlık Bilimleri'nden Yüksek lisans öğrencisi Birthe Frafjord ve Profesör Sigrid Nakremby sorumludur.

Neden katılmanız istendi?
Katılmanız istendi çünkü siz işaret dili kullanıyorsunuz ve 18-64 yaşları arasındasınız.

İşitme Engelliler Derneği ile görüştüm ve anket formunu paylaştım. Anket formu Antalya'daki üyelere gönderildi. Yardım konusunda İşitme Engelliler Derneği'nin seçilmesinin nedeni, çoğu üyesinin Antalya'daki işitme engelliler ve işaret dili çevresinin bir parçası olarak düşünüyor olmalarıdır.

Çalışmaya katılmanız ne anlama geliyor?

- Bu projeye katılmayı seçmeniz, bir anket formu dolduracağınız anlamına gelmektedir. Anket formunun tamamlanması yaklaşık olarak 20 dakika sürecektir. Anket formunda sizinle ilgili sorular, dijital uyumunun bir değerlendirmesi ve akıllı telefonlar ile uygulamaların kullanımı hakkında sorular bulunmaktadır.

Katılım gönüllüdür.
Bu projeye katılmak gönüllülük esasına dayanmaktadır. Eğer katılmayı seçerseniz, herhangi bir sebep sunmaksızın, herhangi bir zamanda geri çekilebilirsiniz. Sizinle ilgili tüm bilgiler gizli tutulacaktır. Eğer bu çalışmaya katılmayı seçerseniz ya da sonradan vazgeçerseniz herhangi olumsuz bir sonucu olmayacaktır.

Gizlilik Politikası- Bilgilerinizi nasıl saklayacağız ve nasıl kullanacağız?

Sizinle ilgili bilgileri yalnızca bu çalışmanın amacı doğrultusunda kullanacağız. Bilgileri gizlilik politikasına uygun ve güvenilir şekilde saklayacağız.

- Bilgilere ulaşacak kişiler öğrenci ve danışmanıdır.
- İsminiz ve iletişim bilgileriniz, bir kodla değiştirilerek, diğer verilerden ayrı şekilde saklanacaktır.

Bu çalışma yüksek lisans tezi içerisinde yayınlanacaktır. Çalışma yayınlanırken, bilgiler tanıyamayacağınız bir şekilde kullanılacaktır.

Araştırma projesini tamamlandığımızda bilgilerinize ne olacak?

Bu projenin Aralık 2020'de sona ermesi planlanmaktadır. Projenin sonunda, kişisel bilgiler silinecektir.

Haklarınız
Projeye ilişkin veri kaynaklarında (rapor gibi) tanınabilir olduğunuz takdirde:
- Sizinle ilgili hangi kişisel verilerin kaydedildiğine bakmak
- Kişisel bilgilerinizi düzeltmek
- Kişisel bilgilerinizi silmek,
- Kişisel bilgilerinizin kopyasını edinmek ve
- Gizlilik temsilcimize şikayet bildiriminde bulunmak ya da Veri Koruma Birimine kişisel bilgilerinizin işleme konulması ile ilgili iletişimde bulunmak,

Hakkına sahipsiniz.

Kişisel verilerinizi kullanma hakkını bize veren nedir?
Sizin onayınıza dayanarak bilgilerinizi kullanmaktayız.

Norveç Bilim ve Teknoloji Üniversitesi- Norveç Araştırma Merkezi adına gizlilik kurallarına uyumlu şekilde kişisel bilgileriniz değerlendirilmektedir.

Daha fazla bilgiyi nerede bulabilirim?
Çalışmaya ilişkin sorunuz varsa, ya da haklarınız üzerinde deneme yapmak istiyorsanız . Lütfen iletişime geçiniz:

Norveç Bilim ve Teknoloji Üniversitesi'nden Sigrid Nakrem: sigridnakrem@ntnu.no, ve Birthe Frafjord: birthef@student.ntnu.no or ya da telefon ile: 92404490.

- Gizlilik Temsilcisi: Thomas Helgesen, thomas.helgesen@ntnu.no.

Hvor kan jeg finne ut mer?
Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- Norges tekniske og naturvitenskapelige universitet ved Sigrid Nakrem, sigridnakrem@ntnu.no, og Birthe Frafjord,birthef@student.ntnu.no eller telefon 92404490.
- Our privacy representative: Thomas Helgesen, thomas.helgesen@ntnu.no.
- NSD – Norwegian Center for Research Data AS, onemail (personverntjenester@nsd.no)orphone: 55 58 21 17.

Saygılarımızla,

Proje Yöneticisi (Araştırmacı/danışman)

Öğrenci

Rıza Beyanı

Digital competence and the use of m-Health applications to communicate with health professionals (Dijital uyum ve sağlık profesyonelleri ile iletişim için mobil sağlık uygulamaları) isimli projeye ilişkin bilgileri okudum, anladım ve soru sorma imkanına sahip oldum.

☐ Anket çalışmasına katılmayı onaylıyorum.

Aralık 2020'de proje tamamlanana dek bilgilerimin kullanılmasına onay veriyorum.

(Katılımcının imzası, tarih)

Appendix 5: Questionnaire

Dijital yeterlilik ve m-Health'in sağlık görevlileri ile iletişimde kullanımı

Lütfen seçeneklerden birini işaretleyiniz.

1. Yasınız:

- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64

2. Cinsiyetiniz:

- Kadın
- Erkek

3. Eğitim düzeyiniz

- Hiç öğrenim almadım.
- İlk okul
- Orta okul
- Universite / Yüksek Öğrenim

4. Sağır olarak mı doğdunuz?

- Evet
- Hayır

5. Hangi dili kullanmayı tercih ediyorsunuz?

- Türk İşaret Dili
- Türkçe
- İkisi de

6. Hekim ofislerinde hangi dili kullanmayı tercih ediyorsunuz?

- Türk İşaret Dili (Doğrudan ya da bir yardımcı eşliğinde)
- Türkçe (Yazılı ya da sözlü)

Lütfen aşağıdaki görevleri yürütmede kendi deneyiminizi tanımlayan sayıyı işaretleyiniz.

0 = Hiç deneyimim yok
1 = Kısıtlı deneyimim var
2 = Biraz deneyimim var
3 = Oldukça kapsamlı deneyime sahibim

7. Bilgi ihtiyaçlarını karşılamak- Defining ınformation needs – Bilgi ihtiyaçlarını belirlemek ve tanımlamak için BİT'yi kullanmak	**0**	**1**	**2**	**3**
(a) ne tür bilgiye ihtiyacınız olduğunu belirlemek ve bilgisayar ya da ınternet kullanarak bunlara nasıl ulaşacağınızı bilmek; örneğin, alışveriş, sehayat ya da devlet ile ilgili gündelik işlerde kullanmak				

8. Bilgiye erişim – BİT'nin yardımı ile istenen bilgiye nereden ve nasıl ulaşabileceğinizi bilmek				
(a) İnternetteki arama motorlarını kullanmak (e.g. Google, Yahoo vb.)?				
(b) Aradığınız bilgiyi barındıran websitelerini bulmak				
(c) Genel bir bakış edinmek için ve gereken websitesinde dolaşmak için				
(d) Devlet ile ilgili ajansların websitelerinde gereken bilgiyi bulabilmek				
(e) Türkçe'den başka dillerde websitelerine erişmek için				

9. Teknoloji kullanımında yeterlilik – Teknolojik işlemleri yürütmede bağımsız olma				
(a) başkasına bağımlı olmadan bir e-mail adresi yaratmak				
(b) başkasına bağımlı olmadan bilgisayara program yükleyebilmek				
(c) CD-ROM'da olan bir programı kullanmak				
(d) Bir anti-virüs program kullanmak ve güncellemek				
(e) bilgisayar programlarını başkasına bağımlı olmadan kullanmak				

10. Bilgiyi yönetmek – Bilgiyi ayıklamak ve düzenlemek				
(a) İnternetten gereken bilgiyi seçmek				
(b) daha sonra bulabilmek için bilgisayarda dosyaları ayıklamak ve düzenlemek				
(c) erişilen bilgiyi düzenlemek; örneğin bilgiyi tablo ve listelere bölmek				
(d) Excel'de yer alan figürleri başka bir programa taşımak ya da tersini yapmak				

11. Bilgiyi değerlendirmek – Bilginin kalitesini, uygunluğunu ve yararını ve ınternet güvenliğini değerlendirmek

(a) İnternette rastladığınız bir bilginin kalitesini değerlendirmek, örneğin, eski, yanlı ya da güvenilmez olduğunu değerlendirebilmek				
(b) İnternete, örneğin Facebook'a ya da sohbet odalarına, koyulacak bir bilginin güvenliğini değerlendirmek				

12. Bilgiyi sentezlemek – Farklı sunum biçimlerinden gelen bllgiyi sent yorumlama, özetlemek ve karşılaştırmak

(a) word işlemcilerinde yazı yazmak, editlemek ya da transfer etmek				
(b) spellcheck programlarını ya da sözlükleri kullanmak				
(c) word işlemcilerine görselleri ya da sembolleri ekleyebilmek				
(d) word işlemcilerine tabloları ekleyebilmek ya da edit edebilmek				
(e) cizim ya da grafik programlarını (örneğin Powerpoint) kullanabilmek				

13. İletişim ve bilgi paylaşmak – BİT'in yardımı ile bilgi değiş tokuşu ya da paylaşımı Sharing and exchanging ınformation and knowledge with the aid of İCT

(a) akıllı telefondan SMS mesajları almak ve göndermek				
(b) akilli telefondan internete bağlanmak				
(c) email mesajı göndermek ya da almak				
(d) emailden ek dosya göndermek				
(e) toplantıları ayarlamak için email ya da elektronik takvim sistemlerini kullanmak				
(f) internetten bilet ismalamak ya da satın almak				
(g) elektrik ölçer turu net bazlı uygulamalara bilgi girişi yapabilmek				
(h) Türkçe websitelerinde eşya alım satımı yapabilmek				
(i) Türkçe dışı websitelerinde eşya alım satımı yapabilmek				
(j) Skype ya da İP telephony kullanmak				
(k) dijital imza kullanmak				
(l) Facebook ya da Twitter gibi sosyal ağlara katılım göstermek				
(m) bir bloğu okumak ya da yorum eklemek				
(n) İnternetteki işbirliği ya da cooperation gruplarına katılmak				

14. Yeni bilgi yaratımı – BİT yardımı ile yeni bilgi üretmek ve sunmak

(a) ulaştığınız bilgiyi oluşturmak ve başkalarına elektronik olarak sunulacak hale getirmek	◯	◯	◯	◯

Aşağıdaki seçeneklerden birini seçiniz-

15. Geçtiğimiz 12 ay içinde, bir hekim ile iletişime geçmek için akıllı telefon kullandınız mı?

◯ Evet
◯ Hayır

16. Akıllı telefonunzuda ya da tabletinizde sağlık ile ilgili uygulamalar bulunuyor mu?

◯ Evet
◯ Hayır

17. Daha önce hiç bir sağlık profesyoneli ile sağlığınız hakkında bir bilgiyi uygulamalar yardımı ile paylaştınız mı?

◯ Evet
◯ Hayır

Appendix 5: Norwegian Data Protection Services

Notification form: 155020

NTNU

Norwegian University of
Science and Technology