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Social media as a source of information and coping with the extensive amount of information related to the Covid-19 pandemic

Differences between digital immigrants and digital natives

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Master's thesis in Governance of Digitalization

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ABSTRACT

Subject: Information studies	
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Abstract:

The Covid-19 pandemic changed the whole world in 2020. The amount of information about Covid-19 increased explosively in the spring of 2020, affecting people's information behaviour. The increased use of social media has changed information behaviour as well, and this study focuses on social media use and information behaviour during the Covid-19 pandemic.

This master's thesis studies if people seek information about the Covid-19 pandemic from social media and how they cope with the large amount of information. The aspect of information overload and information avoiding is also studied.

The data for this master's thesis were gathered in the spring of 2020 from March to May, and the survey was conducted by the subject of information studies at Åbo Akademi University. This study is conducted using a mixed study method, as it includes both quantitative and qualitative aspects. Furthermore, two different age groups are studied: people born in the 1960s and before that representing digital immigrants and people born in the 1980s and after that representing digital natives.

The theoretical framework for this master's thesis is based on three main themes: the theory of digital immigrants and digital natives, the theory of information overload and the theory of monitoring and blunting. First, the theory about digital immigrants and digital natives is used to compare two different age groups. Second, the theory about information overload gives insight into how people cope with such a large amount of information. Third, the theory about monitoring and blunting offers insights regarding how people react to information during the crisis situation.

The results of this thesis indicated that almost half of the survey participants use social media as a source of information, and over half of the participants experience information overload. Significant differences between digital natives and digital immigrants could not be found, even though digital natives used social media slightly more than digital immigrants and digital immigrants experienced information overload somewhat more than digital natives.

Keywords: Covid-19, Coronavirus, pandemic, information behaviour, information overload, social media, information avoidance, digital immigrants, digital natives, monitoring, blunting	
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1. INTRODUCTION

During the past year, the focus of our everyday flow of information has undergone profound changes. The global pandemic Covid-19 has changed the information we see every day to be constantly more about the pandemic. Social media constitute a universal place to share information fast and lately they have been filled with information about Covid-19. The large amount of information in different channels has affected people's information behaviour (Dreisiebner et al., 2020). During the year of 2020, a good deal of research about the impacts of information related to Covid-19 has been implemented, for example, by Nielsen et al., (2020), by Dreisiebner et al. (2020) and by Hong & Kim (2020). However, the situation with Covid-19 is still evolving (World Health Organization, 2020). The present study examines if people use social media as a source of information about the Covid-19 pandemic and how people cope with the large amount of Covid-19 -related information.

1.1. Background

Everyday life all around the world changed drastically in March 2020, when the WHO declared that Covid-19 is a global pandemic. In Finland, the government also declared an emergency powers act to be in effect because of the global pandemic. The amount of information on the issue increased remarkably in March 2020 and still plenty of new information is available about the corona-virus pandemic every day.

To determine the world and the risks associated with living in it, our modern culture and community rely increasingly on written and verbal messages on a daily basis. Such messages do more than just provide data; they may cause large numbers of individuals to act in certain ways and change their views of the world around them (Walaski, 2011, p. 2). One of the risks is global pandemics, which cause a situation that requires good communicating of the information. The information behaviour of people can vary considerably due to different circumstances and human information behaviour has been studied widely, for example, by Tom Wilson (Wilson, 2000). The importance of studying

human information behaviour is highlighted in new situations such as global pandemics and this further motivated the subject of this master's thesis study.

Risk and crisis communication is a mechanism by which a public or private entity communicates information to an audience. Usually, the information is shared following a structured or informal risk evaluation process that delineates risks that may occur and involves some degree of awareness imparted to the audience about how the risks will affect them and how they can plan for the risk (Walaski, 2011, p. 2).

However, the modern world allows anyone to share information through the Internet and social media channels are a common way to share it. This has affected the quality and amount of information we see every day. Internet plays a key role in information searching in today's world (Nazim, 2008). By browsing the Internet, the information about the Covid-19 pandemic is continuous and it is difficult to avoid seeing information about the global pandemic.

People have a natural need for information, but their information behaviour might vary greatly in a time of crisis. Information in crisis situations and large amounts of information might cause information overload and that can lead to feelings of anxiety and feeling overwhelmed (Gorman & Gorman, 2020). Since the amount of information about Covid-19 exploded, how people experience the amount of information has been studied widely. For instance, Dreisiebner et al. studied the information behaviour during the Covid-19 crisis (Dreisiebner et al., 2020), whereas Hong & Kim studied antecedents and consequences of information overload in the Covid-19 pandemic (Hong & Kim, 2020) and Nielsen et al. studied how people in six countries access and rate news and information about the coronavirus (Nielsen et al., 2020).

The subject information studies at Åbo Akademi University was interested in knowing how people feel about sources of information about Covid-19 and how people cope with the huge amount of information about the virus and disease. The survey that provided the data for this study was implemented from March to May in the spring of 2020 and it is a period of time when many similar surveys were made.

1.2. Aim and research questions

In this master's thesis, the aspect of social media usage is studied more specifically. The aim is divided into a two-fold study. Firstly, the study explores the patterns of two different age groups using social media as a source of information. Secondly, it examines how people cope with the large amount of information and if they experience information overload or avoid information.

The main research question is: *Do people search for information about the Covid-19 pandemic in social media?* The main research question is further divided into sub-questions, which focus on people's emotions about the amount of information.

Two different age groups will be compared: people born before 1960 and people born after 1980. These two different age groups represent digital immigrants (born before 1960) and digital natives (born after 1980) (Prensky, 2001a). The theory about digital immigrants and digital natives was developed by Mark Prensky and the theory is further described in the third chapter of this master's thesis.

The sub-questions of this study compare differences between digital immigrants and digital natives. The sub-questions for this study are:

Q1: Are there differences concerning how many of the study participants uses social media as a source of information?
Q2: Are there differences concerning why they use social media?
Q3: Are there differences concerning whether they experience information overload?
Q4: Are there differences concerning whether they avoid information?

This study strives to provide new empirically based knowledge concerning the situation with the Covid-19 pandemic and information regarding it. The study will use both a qualitative and a quantitative study methods to answer the research questions. Firstly, the qualitative aspect is provided and the survey responses are divided into groups thematically. The quantitative aspect will be given about how many from each of these

two different age groups use social media as a source of information and how many experience information overload. This study also examines why people choose their sources and what kinds of feelings people have experienced about the amount of Covid-19-related information.

1.3. Limitations

The data for the survey has been collected in three different languages: English, Finnish and Swedish. This master's thesis study will only focus on the answers given in Finnish because the number of answers given in English was quite limited. Also, other studies have been conducted based on this survey data, for example, by Ojaranta and Eriksson-Backa (Eriksson-Backa, 2020) (Ojaranta et al., 2020). Overall, the survey included 160 answers in Finnish. However, this study seeks differences between digital immigrants and digital natives, so this study does not examine all the Finnish answers but focuses only on a portion of them. Including the answers from people born in 1960 or before and people born in 1980 or after strives to give insight into two different generations, and there is approximately the same number of participants in each age group. By quantitative analysis, it is also tested if different variables, for instance, belonging to a risk group or gender, might affect participants social media usage or information overload. However, the survey respondents included only 12 male participants and 73 female participants. Three participants did not want to answer the question about gender. The small number of male participants contribute to the fact that the quantitative outcomes are not necessarily credible. The participants for this survey were recruited through the Internet, and the survey was conducted as an online questionnaire, which means that only participants who use the Internet could participate.

Answers to this survey are unique because of the open questions in the survey. In every question, there was a possibility to give either long or short answers and there was also a possibility to not answer the question at all. The survey responses are divided thematically using qualitative analysis because the survey questions are designed to be open questions. Overall, the survey has six central questions, but this study will focus only on three of them to answer the research questions. A large amount of false information about the

coronavirus is spread continuously, and the survey includes questions regarding misinformation as well. However, this study will focus on the information overload aspect and where these two different age groups find their information from. Because of the earlier studies conducted by Eriksson-Backa and Ojaranta et al. based on this survey, this study will focus on the social media aspect of the survey answers (Eriksson-Backa, 2020) (Ojaranta et al., 2020).

1.4. Structure of the thesis

This study starts with chapter 1, including introducing the topic and the research aim and questions. Chapter 1 also includes the limitations of this master's thesis study.

Chapter 2 provides an overview of the literature and central concepts of this study. The concepts of information behaviour, information need and information seeking are opened up in this chapter. Information behaviour in the crisis situation is also described in this chapter. Information about the Covid-19 pandemic and the so-called infodemic are presented to provide an overview of the situation this pandemic has caused and why it is essential to study information behaviour during a crisis. As the focus of the present study is on social media usage, the concept of social media as a source of information is also described in this chapter.

In Chapter 3, the focus is on the theoretical framework of this study. It
presents the main theories of this study: the theory of digital immigrants and digital natives, the theory of information overload, and monitoring and blunting.

Chapter 4 describes the research methods and design, how the study approach has been applied and the methodological choices. This study uses a mixed-method approach that combines qualitative and quantitative analysis of the research data. Chapter 5 presents the results and the analysis of the research data. In Chapter 6, the results are discussed in relation to previous research and compared to the study's theoretical framework. Finally, in chapter 7, conclusions and key findings of this study and ideas for future research are presented.

2. LITERATURE REVIEW

This chapter starts with an outline of the definitions of information behaviour and how the crisis situation and the large amount of information relate to people's information behaviour. The definitions of information need, information seeking and information avoidance are described in this chapter which also includes knowledge about the pandemic and the infodemic it has caused. Information has increased, especially on social media channels, and this chapter opens the concepts of social media, information source and misinformation.

2.1. Information behaviour

"Information" is an ancient word, which appears early in one of Chaucer's stories between 1372 and 1386 (Case & Given, 2016). Information can often be seen as a social phenomenon, since it is an instrument by which the sender/source attempts to influence the recipient/user—even though this individual can be influenced in a way that is not expected. The influence or impact of the information is defined as something the obtained information does to the recipient of the message (Spink & Heinström, 2011 p. 258).

Information behaviour aims to explain how people look for and use information in different ways, and it is an area of information science study. The word 'information behaviour' was coined by Thomas D. Wilson in 1981 (Wilson, 1981). The concept has now been embraced, and Wilson's information behaviour model is widely quoted in information behaviour literature. According to Wilson, information behaviour can be described as "those activities a person may engage in when identifying his or her own needs for information, searching for such information in any way, and using or transferring that information" (Wilson, 1999, p. 249). In 2000, Wilson described information behaviour as the "totality of human behaviour in relation to sources and channels of information." (Wilson, 2000 p. 1).

Information behaviour is conceptualised as dynamic information systems that are rooted in an individual's daily social and life context. The influence of information is closely

connected to the idea of the use of information, which is one of the most critical forms of information behaviour (Spink & Heinström, 2011). Because of the increased amount of information, especially in online form, the description of the term information behaviour has also developed over the years. Information behaviour in a modern world could be described as the entirety of human behaviour in relation to information sources and networks, covering the use of information as well as both active and passive information searching (Wilson, 2000). This includes face-to-face communication with others as well as the passive reception of information (such as watching TV commercials) without any intention of acting on the given information (Wilson, 2000).

2.1.1. Information need

Information need is an essential part of the information seeking process. According to Grunig, a "need" is usually defined as an "inner motivational state" that gives rise to thinking, and it leads to action (Grunig, 1989, p. 209). The concept of need can be divided into four general conclusions, according to Green. The first of these conclusions is that need is always instrumental, because it is about reaching a particular goal. Usually, it helps to find the answer to something needed. The second conclusion about need is that "needs" are often contestable when "wants" are not. According to Green, the third conclusion of need is that it is often related to the concept of necessity, for example, "basic human needs", and fourth, need is not necessarily just a state of mind, so it is possible that one might not be aware of one's own needs (Green, 1990).

Wilson proposed the idea of information need. Understanding the information needs of a person concerns three elements: Why the user wants to seek information, what purpose the information will fulfil, and how the information will be used after it is obtained (Wilson, 1981). According to Case and Given, the term information need is often simply described as a cause of information seeking, and it might even be a requirement for the act of information seeking (Case & Given, 2016, p. 82). Information needs in the case of a global pandemic might arise from knowing about an unfamiliar or worrying situation. The information need can also arise from a practical situation, such as the need to know

the most recent decrees by the government to act in a certain way or to seek information about how to act if one feels symptoms Covid-19 might cause.

Information need has been studied during the Covid-19 pandemic as well, and studies have shown that the information need of people has increased because of the pandemic. For instance, according to the study conducted by Dreisiebner et al., information needs and information consumption have increased substantially among German-speaking people since the beginning of the Covid-19 pandemic (Dreisiebner et al., 2020).

2.1.2. Information seeking

The roots of human information seeking activity can be found in the work of library users and readership research in general. The post-war rise in the volume of science literature, either newly written or recently removed from war-time constraints, in 1948 led, to the Royal Society Scientific Intelligence Conference (1948), which marks the beginning of a modern study of human information seeking behaviour (Wilson, 2000). However, the topic goes further along. Perhaps the sense of "seeking information" is often considered to be obvious. The seeking for information is closely related to the idea of need. It is counter-intuitive, but scholars have invested less time in describing the seeking than the need. Many reports of empiric inquiries do not bother to include a description of the information seeking because it is seen simply as an act of what people do in response to the need for information. Instead, studies appear to focus on organisational descriptions of the search, that is, what activities are detected by respondents to the survey (Case & Given, 2016, p. 91).

Johnson describes information seeking like this: "Information seeking can be defined as the purposive acquisition of information from selected information carriers" (Johnson, 1997, p. 26). Information seeking can be done in many different ways. That is why plenty of different models for seeking information have been created, such as the Ellis model, the Kulthau model, the Savolainen model, and the Krikelas model (Dipak, 2017).

Information-seeking behaviour has changed over the years, especially as technology has rapidly developed. Technological advances have brought us constant availability of crisis information through the Internet and increased participation via increased use of technology and social media (Gutteling & de Vries, 2016). Studies suggest that digital media can be influential in supplying information and promoting self-reliance. In particular, recent research has shown that the Internet is used as the most effective tool for acquiring information in urgent circumstances and that people often view it in addition to expert sources (Gutteling & de Vries, 2016).

Kalayou et al. studied people's information seeking during the Covid-19 pandemic, and their results show that often the primary reasons for obtaining information about Covid-19 were to seek information about the disease, diagnosis, or treatment, and to seek for both local and global case reports (Kalayou et al., 2020). According to the study conducted by Kalayou et al., 82.1% of the respondents used different Internet sources for Covid-19-related information seeking (Kalayou et al., 2020).

2.1.3. Information avoidance

The selective use of information and the large amount of it might also lead to avoiding information (Case & Given, 2016, p. 117). Avoidance of information is a widespread phenomenon in everyday life. Information avoidance has implications for numerous aspects of people´s lives, including finance, health, and personal relationships (Case et al., 2012).

Information avoidance has two different forms: active and passive avoidance of information. The avoidance of information is active when it is short-term, and the person knows there is information available and chooses not to read it, even if it is free of charge (Golman et al., 2017). Active avoidance of information might be, for example, avoiding information about serious illness to avoid facing bad news as a coping mechanism. Passive information avoidance is a long-term habituated behaviour seen when people prevent the conscious processing of information that they experience in their daily lives for such a long time that it becomes a passive and subconscious behaviour. Passive

information avoidance often involves information relevant to political or religious views (Case et al., 2012).

In a situation with a global pandemic, information avoidance can have multiple negative consequences. Avoiding information can lead, for example, to unawareness of given instructions, not knowing what the symptoms of Covid-19 are, and not knowing how to act when suspecting infection or unawareness of how the disease spreads. Unawareness can lead to spreading the virus without knowing.

Siebenhaar et al. studied dealing with the Covid-19 infodemic and information avoidance during the pandemic. Their study shows that the distress caused by the Covid-19-related information predicted higher compliance with preventive measures and, in some cases, higher information avoidance. Avoiding information, in turn, predicted lower compliance with preventive measures (Siebenhaar et al., 2020).

2.1.4. Information behaviour in crisis situation

Information behaviour and the need for information changes widely in times of crisis (Butenaité et al., 2016). In everyday situations, people search for information about their interests and goals, but people search for information that focuses on their safety and health in a crisis. Basic needs like survival assurance and safety become relevant and will affect the information seeking behaviour of people (Dreisiebner et al., 2020). As information ecology is rapidly evolving, the Covid-19 pandemic is the first global pandemic to occur in the modern information environment, with all the latest resources on the Internet, such as easy access to global information and user-created social media content (Dreisiebner et al., 2020). In this kind of crisis situation, the information behaviour and needs can change dramatically (Butenaité et al., 2016). Stressful information can affect people differently since some want to have as much information as possible, whereas others might start avoiding information (Miller, 1987).

During the current crisis with the Covid-19 pandemic, health-related information seeking is an essential part of people's information behaviour. Health-related information seeking

could be described as a “knowledge gathering process, resulting from a health query or need” (Mukherjee & Bawden, 2012, p. 242) and health-related information seeking is an important part of people’s information seeking behaviour even when there is no threat of a global pandemic.

According to Beck et al. (2014), 48.5% of the Web users aged 15-30 years use the Internet for health purposes, and about 80% of these people considered that the information they found online was reliable (Beck et al. 2014). Dreisiebner et al. (2020) studied information behaviour during the Covid-19 crisis in German-speaking countries and found that the crisis has led to increased demand for reliable information. From the participants in their study, 75% confirmed that their use of information and news has increased since the pandemic began. (Dreisiebner et al., 2020) The criteria for reliable information were high quality of journalistic, credible information, research facts and that the source of information is official (for example, health organisation) (Dreisiebner et al., 2020).

Nielsen et al. studied how people in six countries access and rate news and information about the coronavirus. Their study also determines that people often use social media as a source of information, even though they might not find the information to be very accurate (Nielsen et al., 2020). The data for their study were collected in March and early April from people located in six different countries: Argentina, Germany, South Korea, Spain, the United Kingdom and the United States (Nielsen et al., 2020).

The study shows how people accessed news and information about Covid-19, how they rate the trustworthiness of the different sources and platforms on which they rely and how much misinformation they misinterpret (Nielsen et al., 2020). The data in their study indicate that the use of news has increased in all of the six countries, and people in these countries most likely use social media, video sites, messaging apps and search engines, or combinations of these, to access news and information about the coronavirus (Nielsen et al., 2020).

According to the Nielsen et al. study, people with a low degree of formal education are much less likely to state that they rely on Covid-19 news and they are much more likely

to rely on social media. In South Korea, Argentina, the US and Spain, young people are much more likely to rely on social media, and in Germany and the UK they are more likely to rely on messaging apps (Nielsen et al., 2020). In addition to the differences based on geography, there are differences based on age and educational background, as well. People with higher education trust information coming from scientists, doctors, and health experts (Nielsen et al., 2020).

2.2. Covid-19 pandemic

In February 2020, the WHO named the disease "Covid-19", which is short for coronavirus disease 2019 (Adhanom, 2020). In the spring of 2020, The World Health Organisation (WHO) declared Covid-19 as a global pandemic. This drastically changed people's lives all around the world and has also affected the world economy (Fernandes, 2020). While it is still unclear precisely where the pandemic began, several early cases of Covid-19 were traced to people who visited the Huanan Seafood Wholesale Market, based in Wuhan, Hubei, China (Sun et al. 2020).

With the explosive increase of confirmed cases, on January 30th, 2020, the WHO declared this outbreak a public health emergency of international concern (Sun et al. 2020). The symptoms of Covid-19 are highly variable, varying from none to severe disease. The virus travels primarily across the air while people are close to each other. It leaves an affected person through breathing, coughing, sneezing, or speaking and reaching another person through their mouth, nose, or eyes. It can also spread across infected surfaces (World Health Organization. 2020).

The number of confirmed cases increases fast. On March 13th, 2021, there were 126 890 643 confirmed cases and 2 778 619 Covid-19-related confirmed deaths worldwide. There are confirmed cases in 223 different countries (WHO 2021).

Since Covid-19 was labelled as a global pandemic, exchanging essential information from various sources is continuous and ever-changing (Poonia & Rajasekaran, 2020). New statistics is continuously created about Covid-19, and new information, government

briefs and comments from experts are presented all the time. Covid-19 has dominated the news since March 2020, when the WHO announced it as a pandemic (Hong & Kim, 2020).

Providing health information is vital, because it allows people to acquire insights and make better choices about their health. In fact, in times of health emergencies such as Covid-19, people become very attentive to this knowledge and, by doing so, attempt to reduce the fear and destructive emotions associated with the previously unknown illness. However, studies have shown that the constant overload of information has negatively affected people, leading to information avoidance, failure to comply with the given recommendations, and uncertainty in decision-making (Hong & Kim, 2020).

2.2.1. Infodemic during the Covid-19 pandemic

During a pandemic, an infodemic is described as an abundance of information, including inaccurate or misleading information, in both digital and physical environments. It leads to uncertainty and risk-taking habits that may be harmful to one's wellbeing. It also breeds cynicism towards health authorities, weakening public health response (Bradd, 2021). When people are uncertain of what they need to do to protect their wellbeing and the health of those around them, an infodemic will worsen or lengthen outbreaks. In addition, with increased digitisation – an increase in social media and Internet use – information will spread more quickly. This can help to fill information voids more efficiently, but it can also intensify negative signals (Bradd, 2021).

The excessive amount of information and knowledge is one of the features of the modern world. Power is no longer a matter of having access to information but of handling it. Indeed, the introduction of the Internet and social media has undoubtedly encouraged the circulation and distribution of information, opening up opportunities for consumers to access, communicate and create content. This situation has led to a democratisation of the current relationship between information and people (Pulido et al., 2020).

Misinformation and fake news have been widespread in the era of social media and have been on the enormous rise since the beginning of the Covid-19 pandemic. Misinformation is false or inaccurate, especially false information that is deliberately intended to deceive and fake news has no basis but is presented as factually accurate. This condition is severe, because it destroys confidence in health services and health institutions. Therefore, on 29 June 2020, the WHO officially opened its 1st Infodemiology Conference on Global Impacts and Control of Infodemics, which brought together foreign experts from diverse science and political perspectives.

Immediate and universal sharing of medical and other scientific knowledge outside of specialist circles until it has been fully tested can be risky, particularly in the case of a pandemic (The Lancet Infectious Diseases, 2020). The impacts of the infodemic during Covid-19 have been studied during the past year. For example, Islam et al. studied the Covid-19-related infodemic and its impact on public health (Islam et al., 2020). Their study focused on analysing rumours, stigma and conspiracy theories in social media posts. They studied 2311 social media reports related to Covid-19 from 87 countries and found that 89% of the reports could be classified as rumours, 7.8% conspiracy theories and 3.5% stigma (Islam et al., 2020).

The WHO is collaborating with partners across the world to strengthen the research field of infodemiology. Infodemiology can be defined as the study of the determinants and distribution of information primarily on the Internet or society, with the overall goal of informing about public health and public policy (Eysenbach, 2009). The aim is to create and provide long-term tools that health authorities and societies can use to avoid and mitigate the detrimental consequences of infodemics (Bradd, 2021). The WHO cooperates to strengthen digital capacity in order to increase digital and health awareness, develop resistance to disinformation (false or misleading information), and access new ways to provide audiences with trustworthy health details (Bradd, 2021).

2.3. Information source

The source of information is an object, person or place from which the information arises, originates or is received. The source of information may be referred to as primary or secondary, and the source may advise a person about something or provide information about it. Virtually, information can come from almost everywhere: blogs, books, newspapers, social media, articles, magazines or journals, personal experiences and websites. The need for information usually defines where the information should be searched from (Kosrow, 2020).

2.3.1. Social media as a source of information about Covid-19

Social media means collaborative Internet-based technologies that promote the development or exchange of content, thoughts, and other modes of expression across virtual communities and networks (Hoffmann & Bublitz, 2017 p. 31). Perhaps the most distinguishing aspect between social media and traditional media is the ability for people to engage in conversation and add information. It provides a contrast to conventional mass media communication, in which communication is usually one-way, from a specialist text creator to a broad anonymous mass audience. Anyone on social media can participate, share messages, and communicate with any number of other people (Hoffmann & Bublitz, 2017 p. 31). Social networking sites and social media apps are tools that enhance our capacity to communicate and participate in collaborative action, all beyond the context of conventional hierarchical structures and organisations (Fuchs, 2014).

Liu et al. (2016) examined social media use during disasters and found that in a crisis situation, people communicate about the disaster via interpersonal forms, for example, face-to-face, telephone call and direct messages, rather than through social media channels (Liu et al. 2016). However, their study was done in 2016 as a field experiment simulating a hypothetical disaster, and the use of social media channels has increased since. Research done by Dreisiebner et al. in 2020 about information behaviour during the Covid-19 pandemic shows that participants did not react by communicating via interpersonal forms. However, they instead read the information from trusted traditional

sources, for instance, official health organisations. However, there are different outcomes between the studies about information behaviour during the Covid-19 pandemic. Nielsen et al. studied how people in six countries access and rate news and information about Covid-19. Their study shows that most people in these countries are using social media, video sites, search engines, or messaging applications to get information and news about Covid-19. Especially people with a lower education level were likely to use social media (Nielsen et al., 2020).

Social media sources are the most commonly used channels of information in the world. Fast and cheap Internet access, as well as a vast number of registered users, make them one of the simplest and most powerful ways to disseminate information (González-Padilla & Tortolero-Blanco, 2020). During big events, whether it is a sporting event, an illness, or a natural disaster, the general reaction is usually a larger quest for information (González-Padilla & Tortolero-Blanco, 2020). The quick distribution of protocols at the regional, global, and international levels has been one of the most significant characteristics of social media networks in this pandemic (González-Padilla & Tortolero-Blanco, 2020). Cinelli et al. studied the Covid-19 infodemic in social media, and according to their findings, information spread is influenced by the engagement model imposed by the specific social media channel or by the specific interaction patterns of groups of social media users (Cinelli et al., 2020).

Social media as an information source has both disadvantages and advantages. For instance, in the Covid-19 period, social media channels significantly benefit from the accelerated distribution of instructive and educational material about the pandemic. There is a broad interest in the quicker distribution of knowledge about prevention measures (González-Padilla & Tortolero-Blanco, 2020). Studies have shown that disseminating science literature on social media sites raises the number of downloads, requests, and citations of these posts, which, along with the Covid-19 pandemic, have undeniably provided for the rapid propagation of information worldwide (González-Padilla & Tortolero-Blanco, 2020). Among the weaknesses is the probability that the material communicated is out of date, has not been peer-reviewed, is invalid, wrong, irrelevant to our environment, or even misleading. Also, the capacity for incorrect, alarmist and

misleading facts to be disseminated on social media may induce panic, stress, depression, and anxiety in individuals (González-Padilla & Tortolero-Blanco, 2020). Soroya et al. studied information avoidance in the time of the Covid-19 pandemic, and they stated that when comparing different information channels, only exposure to information from social media resulted in information overload and information anxiety (Soroya et al., 2021).

2.3.2. Misinformation in social media

When using social media as a source of information, people often come across misinformation. Misinformation is misleading or incorrect information that is transmitted regardless of the purpose to mislead. Mass communication has affected the history of misinformation as well as propaganda and disinformation (Posetti & Matthews 2018).

The amount of information people create every day is more significant than ever, and according to the IBM report in 2016, 90 per cent of all the information that exists in the world was created in the past two years, and the amount of information has only increased since. Unfortunately, when the information is created and published quickly, it does not leave time for serious reflection or testing if the information is true or false (Helfand, 2016 p. 2).

The amount of misinformation has increased because the amount of information overall has increased. Sharing and validating information has been rewarded and valued throughout human history. In history, there was very little information, but it was relatively reliable and of high quality. Now the situation is the opposite when virtual information is unlimited, but the quality of information is not good, and the information is not reliable (Helfand, 2016 p. 3).

Several data collections have already been conducted for the current Covid-19 crisis, and some initial findings of data-oriented studies have been released. The spread of knowledge on social media has shown some essential preliminary findings. A significant amount of misinformation is being disseminated during the Covid-19 crisis (Yang et al., 2020). In addition, artificially generated content from bots affects the dissemination of misinformation (Ferrara, 2020).

An online experiment was done by van der Meer and Jin (2020) about decreasing the amount of misinformation in a public health crisis. They found that the existence of corrective information contributes to the debunking of false misinformation-based assumptions. In addition, government institutions and news media sources are more effective in increasing the consistency of opinion than social peers (Van der Meer & Jin, 2020).

3. THEORETICAL BACKGROUND

This chapter starts with an outline of the theoretical framework of the study. The central theories used in this study are described in this chapter.

3.1. Theoretical framework of the study

The theoretical framework of this master's thesis consists of three different theories: the theory about digital natives and digital immigrants, the information overload theory and the theory about monitoring and blunting. Figure 1 shows the theoretical framework of this master's thesis study. The main question is to solve if people search for information about Covid-19 from social media and how people cope with a large amount of information.

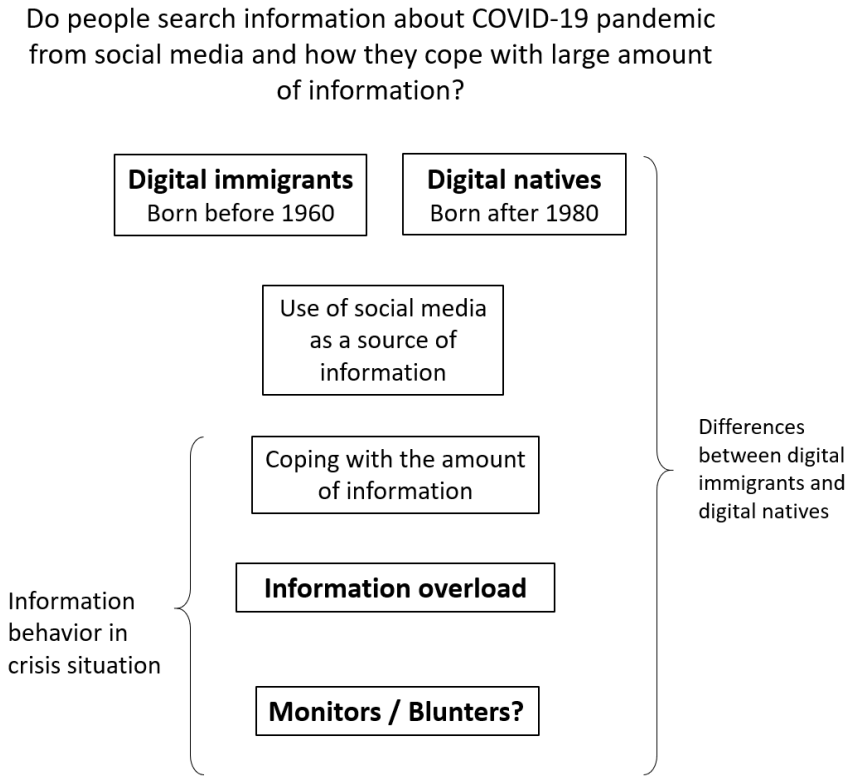

Figure 1: Theoretical framework of the study

The first part of the theoretical framework of this study is the theory of digital immigrants and digital natives. The survey participants are divided into two different age groups: people born before 1960 and people born after 1980. These groups represent digital immigrants and digital natives. The study examines if these people use social media as a source of information about the Covid-19 pandemic and compare the differences between digital immigrants and digital natives. This study also examines their coping with a large amount of information, for example, if they experience information overload and if they do, are they monitors or blunters?

3.1.1. Theory of digital natives and digital immigrants

"Digital natives" are the latest generation of young people born into the digital world, while "digital immigrants" are those who have learned to use technology at some point in their adult life. According to Prensky, people born in 1980 or later are digital natives and people born before 1980 are seen as digital immigrants. The name "digital native" refers to their ability to be "native speakers" of the digital language of the Internet, computers and, for example, video games (Prensky 2001, a). Digital Natives represent the first generation to grow up with new technology. They have lived their entire life around computers, video games, portable music players, video cameras, mobile phones, and all the other technologies and tools of the digital age. According to Prensky, an average college graduate in the year of 2001 spent less than 5,000 hours reading in their lives, but more than 10,000 hours playing video games (Prensky 2001, b). Since digital natives have grown as surrounded by digital sources and technology, their information seeking behaviour is different from that of digital immigrants, as well. Digital natives have become accustomed to finding information quickly and multitasking, whereas digital immigrants might use more time to become familiar with a specific subject (Prensky 2001, a).

Prensky's theory about digital immigrants and digital natives has been criticised. For example, Wang et al. suggested that rather than seeing the difference between digital immigrants and digital natives as a strict dichotomy, this difference might be

conceptualised best as a continuum because some people are technologically more capable than others (Wang et al. 2013).

This study uses Prensky's theory about digital natives and digital immigrants to see if there are differences in how these two age groups search for information. The theory about digital immigrants and digital natives has also been criticised by Bennett et al. because it presents the differences between digital natives and digital immigrants as too straightforward (Bennett et al. 2008). For example, there are not necessarily differences between people born in 1979 and 1980, although Prensky's theory suggests that those born in 1979 are digital immigrants and those born in 1980 are digital natives. However, in the case of this study, respondents are counted as digital immigrants if they were born in the year 1960 and before that and those who are counted as digital natives were born in the year 1980 and later, so there may be differences between these age groups for this study.

3.1.2. Information overload theory

According to Rogers, information overload "is the state of an individual or system in which excessive communication inputs cannot be processed, leading to a breakdown." (Rogers 1986, p. 181).

The term information overload has become more common since the increased amount of information on the Internet. Especially in a crisis situation, the amount of information can lead to experiencing information overload. Management theorist Henry Mintzberg has written about information overload and its effects on making decisions, that the brain sometimes has difficulties processing all the relevant information because there is simply too much of it or it may not fit with previous patterns and our expectations, and some of the information may be too threatening to accept at all (Mintzberg, 1975, p. 17). In the case of the Covid-19 pandemic, in addition to a large amount of information, the information might also be too threatening to accept (Soroya et al., 2021).

Even though it is customary to treat information selectively (Case & Given, 2016) and selecting the information is a phenomenon that people do just to have the information that is nice to know, it exposes challenges in a crisis. The amount of information is enormous, and it is in principle negative, so that information overload might lead to information avoidance in a problematic way. Such selective exposure to environmental inputs is, however, referred to as "filtering" by psychologists Miller G. A. et al. (1960), who point out that it is normal for humans to filter their information experience (Miller et al., 1960).

Information overload has also been studied during the Covid-19 pandemic. For example, Mohammad et al. examined the assessment of Covid-19 information overload among the general public. Their study measured the level of information overload related to Covid-19, and their study was conducted as an online survey with a total number of 584 respondents. Their study determined that the frequency of information and the source of information was associated with experiencing the information overload about Covid-19-related information. According to the study by Mohammed et al., people who received information about Covid-19 through mass media were more likely to experience information overload than the people who received Covid-19-related information via social media. The Covid-19-related information is often contradictory, causing uncertainty and information overload in the general public. This will have a negative impact on the steps put in place to monitor the spread and management of the Covid-19 infection (Mohammed et al., 2021).

Information overload has many downsides. Poonia and Rajasekaran also studied information overload during the Covid-19 crisis, and they suggested a method to share updates among frontline staff during the Covid-19 pandemic (Poonia & Rajasekaran, 2020). When the amount of information is enormous, there is a risk that important information goes unnoticed because of all the other information. Therefore, it is crucial that health workers, for example, get the information they need efficiently and reliably. Poonia and Rajasekaran studied information overload from the point of view that the large amount of information would not hamper health workers information receiving and they could be guaranteed a rapid transfer of important and trustworthy information (Poonia & Rajasekaran, 2020).

3.1.3. Theory of monitoring and blunting

The study done by Dreisiebner et al. in 2020 found that most of the participants had increased their use of information during the Covid-19 pandemic (Dreisiebner et al., 2020), but that is always not the case. People react differently in a crisis situation, and S. M. Miller has developed a theory about monitors and blunters, which refers to different kinds of personalities and their information behaviour changes during a crisis. The situation with the Covid-19 pandemic has increased both; active information seeking but also information avoiding (Dreisiebner et al., 2020).

People's information seeking behaviour changes dramatically in a stressful situation according to the theory of monitors and blunters. Monitoring and blunting theory is based on the theory of avoidance and vigilance or alertness. It was developed by S. M. Miller, a psychologist who researched stress and information behaviour. The theory explains people's information seeking behaviour in stressful or negative situations. According to the theory, people differ in their preference for information when they face a stressful situation. Monitors are the people who seek information to keep informed of the threat-related situation because knowing "what is happening" helps them to decrease their stress. On the other hand, blunters tend to avoid information about a stressful event because it increases their stress levels (Miller, 1987).

Miller's theory about monitoring and blunting is taken into account in this master's thesis study because this master's thesis also strives to find out if a group of people avoids seeing information and a group that wishes to see plenty of information about the subject. The theory might be slightly straightforward because people who might do both actively seek information and avoid seeing information in other situations. However, Miller has created a scale of high monitors and low monitors as well as high blunters and low blunters to show that people might have different stages of monitoring and blunting (Miller, 1987).

Siebenhaar et al. studied dealing with the Covid-19 infodemic and their study included discussion about the monitoring and blunting theory, as well. Their findings suggest that avoidance of information can play a role in the negative consequences of information-related anxiety, interfering with crisis management. Whether or not information-related

anxiety leads to avoidance is most likely a result of the personal coping style of monitoring or blunting (Siebenhaar et al., 2020). As a result, in their study, monitoring behaviour (e.g., watching more television than before the crisis, looking for health facts on the Internet) was the optimum predictor of higher compliance with prevention measures (Siebenhaar et al., 2020). They also suggested in their research that future research about the coping styles regarding the Covid-19-related information could be implemented (Siebenhaar et al., 2020)

4. RESEACH METHODS AND DESIGN

This chapter includes knowledge about the data collection for this study and how the survey was structured. This chapter also includes information about the design of this study and how the data were analysed. The present study is conducted using a mixed-method approach. In this chapter, the purpose and structure of the data collection methods and data analysis are described. The study collects the data for the research from a survey done by the subject of information studies at Åbo Akademi University. This study uses two different approaches in analysing the data from the survey: First the answers are analysed using thematic analysis which is one method of qualitative analysis. For the questions on whether people use social media to search for information about the Covid-19 pandemic and whether they experience information overload, a quantitative analysis of survey data was also conducted based on the qualitative analysis. For the quantitative aspect, the respondents of the survey are divided into the groups of digital immigrants and digital natives by age. With a quantitative method, differences between variables such as gender and belonging to a risk group are also tested. In addition, a qualitative aspect is analysed from the sub-questions of the survey. The qualitative aspect also offers insights into the question of how people feel about the amount of information and why they choose their information sources.

4.1. Data collection

The data for this study were collected by the subject of information studies at Åbo Akademi University in the spring of 2020. The answers were collected via an online form and the survey was open during March 24th to May 15th, 2020. The participants were anonymous, but some background information was collected, for example their age, occupation, city they live in, gender and whether they belong to a risk group or not. However, it was not obligatory for the participants to give any information about themselves. The survey answers were collected in three different languages, Finnish, English and Swedish. This study uses only the Finnish answers of the survey and the total number of Finnish answers is 160. This study only uses the answers from people born before 1960 and people born after 1980 to compare differences between digital

immigrants and digital natives, so the participants are divided into two different groups based on their age. This study includes 45 answers from people born 1980 or after and 43 answers from people born in 1960 or before.

Eight researchers from information studies at Åbo Akademi University shared the survey on their own social media pages (for example Linkedin, Twitter, Facebook and Instagram) and some of them shared the survey in their own personal Whatsapp groups. The survey was also shared in Åbo Akademi University's Yammer page, Åbo Akademi University's web page as well as in the kirjastot.fi and biblioteken.fi pages. Kirjastot.fi is a web page that includes knowledge about libraries in Finland. It has collected a large amount of information about libraries, literature, music, news and information seeking in one place. Biblioteken.fi is the same kind of page in Swedish. The participants had six weeks to answer to this survey, starting from March 24th, 2020. From all of the answers, 73.3% were received in March, 22.4% of the answers were submitted in April and only 4.2% of the answers came in May. This means that most of the data were collected from the beginning of the Covid-19 pandemic.

The idea of the survey was to find out participants' feelings and behaviour regarding the information about Covid-19. The survey included multiple questions, such as from where the participants obtain the information they need, how they handle the amount of information and how they evaluate the reliability of the information.

The amount of data collected with this survey was large and other studies are conducted based on the survey as well. However, this study is mainly focused on the social media and information overload aspects of the survey. That is why this study mainly analyses the data from questions one and three of the survey. The survey questions can be seen in section 4.1.1. on page 32 and in appendix 1 on page 80. The question about participants' background is also taken into consideration in this study, because the background information helps to divide the participants into categories based on different variables.

4.1.1. The structure of the survey

The survey contained seven background questions and five main questions with sub-questions (see Appendix 1 on page 80). The participants had the option to choose how many questions they want to answer, and both short and long answers were welcomed. Background information that was gathered from the participants included age, gender, city or municipality, educational background/occupation, in what language(s) the participant searches for information, if they belong to a risk group and if someone in their near environment has been diagnosed with the coronavirus disease. These questions were mainly structured in a way that the participants can answer with one word or select a number. The five main questions in the survey are open questions with a possibility to give long or short answers. These five main questions and their sub-questions were:

1) From where do you get information/news about the corona epidemic at the moment? How do you update yourself about the corona situation?
   (For example, government health services websites, Yle news on television and/or radio, on websites, newspapers, friends, relatives, social media such as Facebook, Instagram, YouTube, WhatsApp, Snapchat, TikTok etc.)?

   a) Why do you choose these sources? People can have a need to receive different kinds of information, and both formal and informal information can be important.

2) Is false/unreliable information about the corona situation a problem for you (for example rumors, misunderstandings, misleading information (disinformation) or contradicting information)?

   a) Why is it a problem?

   b) How do you evaluate the reliability of the corona information or news?

3) How do you cope with the amount of information/news about the corona situation (too much information, too little information)?

    a) What kinds of feelings do you have about the amount of information?

4) Can you give us 1-2 examples of good and 1-2 examples of bad experiences regarding the information about the corona epidemic.

5) Any other experiences you would like to share regarding corona information in general?

4.2. The design of the study

The critical methodological decision includes the choice between quantitative and qualitative approaches and determining whether they are effective in answering the study questions. Although qualitative methods are used to achieve deep and comprehensive knowledge on the subject, quantitative methods are used to collect more significant quantities of information on a specific subject (Creswell & Creswell, 2018). Therefore, this study is designed to offer both qualitative and quantitative aspects to answer the research questions.

The goal of the study was to obtain knowledge of feelings regarding the amount of information and the use of information sources. Because of that, the qualitative approach with open-ended questions was applied. However, the quantitative aspect was conducted as well because the main question of this study is to find out if people use social media as a source of information about Covid-19 and the quantitative aspect was conducted to see if there are statistical differences between digital immigrants and digital natives with choosing the information source. In addition, the aspect of information overload is tested using quantitative analysis.

4.3. Data analysis

Qualitative and quantitative analysis approaches are frequently contrasted as reflecting two world views. In quantitative circles, qualitative analysis is generally regarded with scepticism and perceived to be lightweight since it includes limited surveys that may not be reflective of the larger community, and it is seen as non-objective, and findings are judged as biased from the participants' own perspectives or views. On the other hand, quantitative analysis in qualitative circles may be discounted as oversimplifying a person's knowledge in the cause of generalisation, failing to consider researcher prejudices and preferences in study design, and needing guesswork to grasp the subjective sense of aggregate results (Hammarberg et al. 2016).

However, the qualitative and quantitative methods can be used together in the same research. They can be used sequentially, where the first approach is used to facilitate the design of the second, they can also be used in parallel as different approaches to the same question, or the prevailing approach can be enriched by a small portion of the alternative method (Hammarberg et al. 2016).

Qualitative approaches are used to address questions about reality, context, and viewpoint, most often from the researcher's point of view. Typically, these data cannot be counted or calculated. Qualitative analysis strategies can include small-group conversations to explore values, behaviours and normative behaviour concepts, semi-structured interviews to seek perspectives on a given subject, or key informants, context knowledge, or institutional insight. Qualitative research can also be done as in-depth interviews to explain the situation, experience or occurrence from a particular perspective and study of texts and records, such as government papers, newspaper stories, blogs or publications, to learn about distributed or private information (Hammarberg et al. 2016).

Data analysis of this study was conducted using qualitative and quantitative analysis, so the analysis includes two perspectives. A qualitative approach is the primary analysis approach in this study because of the structure of the survey questions. The survey was conducted with open questions, and that is why the data were analysed with thematic

analysis, which is a type of qualitative analysis. Thematic analysis is a successful approach to study when the researcher wants to determine people's values, knowledge, opinions, views or experiences from a collection of qualitative data, such as interview transcripts, survey responses or social media accounts (Caulfield, J. 2019).

In addition, quantitative analysis was conducted to gain insight into differences in using social media as a source of information between two different age groups. It was also used to see if there are differences in feeling information overload between digital natives and digital immigrants.

Quantitative analysis approaches are suitable where facts are needed to address the research query; when general or probability knowledge is sought on viewpoints, behaviours, perceptions, beliefs or preferences; when variables must be separated and defined; when variables may be related to hypotheses prior to data collection and when the question or issue is identified, it is transparent and unequivocal. (Hammarberg et al. 2016) In this study, quantitative analysis is tested using chi-square tests to see if there is a statistical difference between digital immigrants and digital natives in using social media as a source of information and if they experience information overload. Different background variables like belonging to a risk group and gender were also tested.

The Chi-square test is one approach to demonstrate an association between two categorical variables (Glen, 2013). A chi-squared statistic is a single number that shows how much difference there is between the measured counts (Glen, 2013). The chi-square test is commonly used in testing the independence of distributions or random variables from the classified frequency range (Tilastokeskus, n.d.).

5 RESULTS

This chapter contains results of both the quantitative and qualitative analyses. The quantitative analysis of the differences in social media usage between the different age groups is presented. The information overload aspect is also presented as well as differences between digital immigrants and digital natives in that area. In the quantitative analysis, it is also tested if variables such as belonging to a risk group or gender affect the use of social media or experiencing information overload. Qualitative analysis was conducted on the survey answers to be able to divide the answers thematically and then by quantitative analysis to see if the differences between these groups based on different variables are significant. In the end, the main findings of both analysis methods are summarised.

This study uses only the Finnish answers of the survey and only the age groups born in 1960 or earlier and born in 1980 or after are analysed. First, the answers were divided into the groups: people born before 1960 and people born after 1980 (digital immigrants and digital natives). Figure 2 shows information about the survey participants. This study includes 88 participants in total: 43 participants (48.9%) are digital immigrants and 45 participants (51.1%) are digital natives. The digital immigrants were born between 1941 and 1960 and the digital natives were born between 1980 and 1998. From the altogether 43 digital immigrants, five were male participants and 38 were female participants. From the total of 45 digital natives, seven were male participants, three participants did not want to categorise their gender and 35 were female participants. Overall, only 13.6% of participants were male and 83% were female. Nineteen digital immigrants belong to a risk group which constitutes 44.2% of the digital immigrants. Of the digital natives, only three belong to a risk group which is 6.7% of all the digital natives. Overall, 25% of participants belong to a risk group and 60.2% do not belong to a risk group. There were 14.8% of participants who did not know, if they belong to a risk group or not. Participants extensively live in different parts of Finland. Five participants (5.7%) were students, 50 participants (56.8%) were employed, one participant (1.1%) was self-employed, three participants (3.4%) were unemployed, whereas one participant (1.1%) was a homemaker and 28 participants (31.8%) were retired.

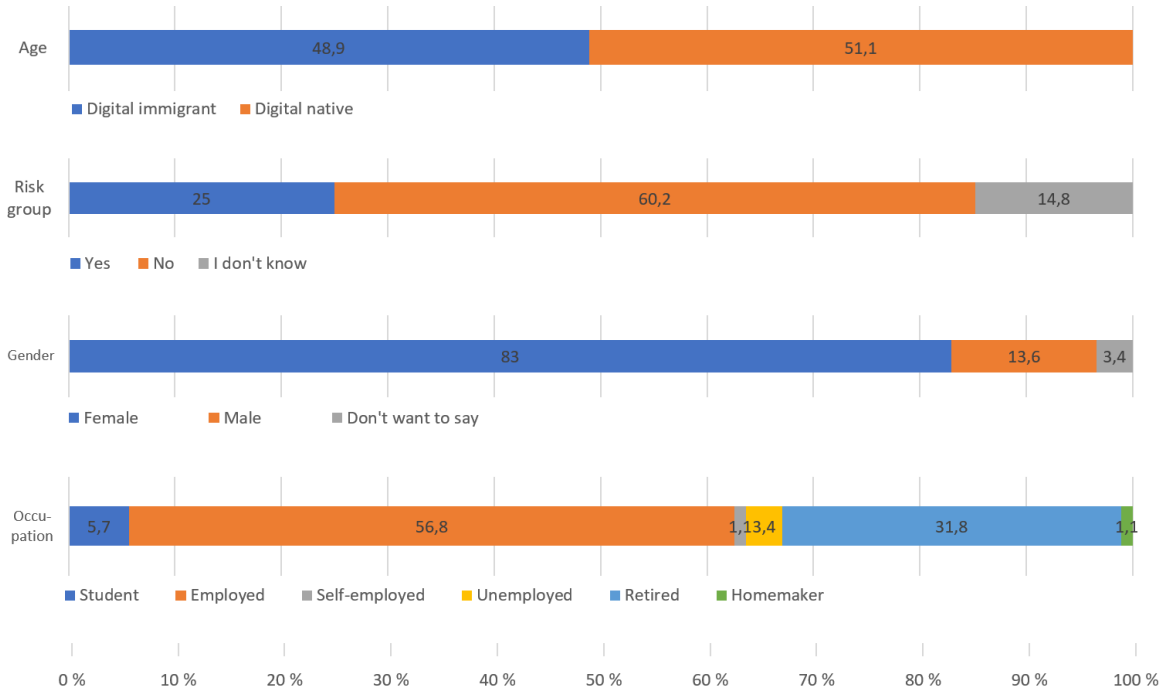

Figure 2: Background information about survey participants

5.1. Social media as a source of information

This part analyses the use of social media as a source of information among two different age groups: digital immigrants born before 1960 and digital natives born after 1980. Data for analysing the use of social media are collected from the first question of the survey:

1) From where do you get information/news about the corona epidemic at the moment? How do you update yourself about the corona situation?
(For example, government health services websites, Yle news on television and/or radio, on websites, newspapers, friends, relatives, social media such as Facebook, Instagram, YouTube, WhatsApp, Snapchat, TikTok etc.)?

The first step of thematic analysis is familiarisation. Therefore, it is essential to provide an overview of all the data gathered before analysing specific items. (Caulfield, 2019). Once the overview of the survey answers was provided, the data were colour-coded into different groups based on the answers that included mentions on using social media as

sources of information and the answers that did not include any mentions about social media.

The sources counted as social media were platforms that enable any people to create information, share information and comment on it. The platforms mentioned were Facebook, Twitter, Instagram, Snapchat, TikTok, WhatsApp and LinkedIn. All of these are platforms that permit the users to participate in creating, commenting, and sharing the information.

A few participants had mentioned social media just as "social media". For example, one participant wrote this:

> *"TV/radio, social media, newspaper (local). I'm used to using these channels and they are in my opinion reliable"*
> – Female, digital immigrant born in 1946

whereas other participants listed different social media channels, for example*:*

> *"Facebook, Instagram, whatsapp, BBC, CNN, YLE, TV news, newspapers, friends, family members".*
> – Female, digital immigrant born in 1948

The colour-coded answers were then grouped into two themes, depending on whether they contained mentions of uses of social media as a source of information or if they did not mention anything about using social media as a source of information. Table 1 presents the use of social media as a source of information among the digital natives and the digital immigrants. Overall, 42 people (47.7%) out of 88 participants have mentioned one or several social media channels that they use as an information source. Forty-six people (52.3%) out of 88 participants have not mentioned any social media sites as their source of information. All of the participants that mentioned social media as a source of information mentioned other sources as well, for instance news (Different kind of news channels were mentioned, for example international news channel BBC and Finnish news

channels Yle news, Ilta-Sanomat, Iltalehti, MTV news), television, radio, and official websites of health organisations like THL or the WHO. THL is a Finnish health organisation, and the shortening THL comes from the words Terveyden ja Hyvinvoinnin Laitos, which means the Institute for Health and Welfare in English. The WHO is an international health organisation, and the shortening WHO comes from words World Health Organisation. The participants who did not mention social media as their source of information mentioned other sources like news, television, radio, and official websites of health organisations. Some participants had mentioned that they do not read social media channels because they do not trust that the information is reliable..

5.1.1. Differences between digital immigrants and digital natives

Table 1 shows that eighteen of the 43 digital immigrants have mentioned one or several social media channels in their reply to the question on information sources about the Covid-19 pandemic. This is 41.9% of the digital immigrants overall. Twenty-five (58.1%) of the digital immigrants have not mentioned social media as their source of information.

Of 45 digital natives, 24 participants have mentioned one or several social media channels in their reply to the question on information sources about the Covid-19 pandemic. This is 53.3% of the digital natives overall. Twenty-one (46.7%) of the digital natives have not mentioned social media as their source of information. Because of the open form of the questions, it is impossible to say that some participants use social media and others do not. We can only assume that those who did not mention social media do not necessarily use them as a source of information.

Based on the results of the qualitative analysis, quantitative aspects were also analysed. Chi-square tests were made to see if there are statistical differences between different groups. According to the chi-square test made concerning using social media as a source of information, there were no significant differences between digital immigrants and digital natives about their use of social media ($p>0.05$, see Table 7 in the appendix). With chi-square test, a p-value of 0.05 and smaller numbers usually indicate that the difference between the two groups is significant. The significance between the digital immigrants

and digital natives in this case was 0.281 which means that the difference is not statistically significant.

Table 1: Use of social media as a source of information

		Uses social media as a source	Haven't mentioned social media	Total
Digital immigrant (born before 1960)	Count	18	25	43
	% within immigrant-natives	41.9%	58.1%	100.0%
	% of Total	20.5%	28.4%	48.9%
Digital native (born after 1980)	Count	24	21	45
	% within immigrant-natives	53.3%	46.7%	100.0%
	% of Total	27.3%	23.9%	51.1%
Total	Count	42	46	88
	% within immigrant-natives	47.7%	52.3%	100.0%
	% of Total	47.7%	52.3%	100.0%

5.1.2. Differences between risk group and not belonging to risk group

Different background variables of the participants were also tested, for example, is there differences in using specific information sources depending on if the participant belongs to a risk group or not. Most of the participants who belong to a risk group are digital immigrants, and a large amount of them might be in a risk group based on their age. Table 2 presents the differences in using social media as a source of information between the people in a risk group and people who do not belong to a risk group. From the total number of participants (88), there were 22 participants (25%) who knew they belong to a risk group and 53 participants (60.2%) who knew they do not belong to a risk group. Thirteen participants (14.8%) did not know if they belong to a risk group or not. Nine participants (40.9%) belonging to a risk group mentioned some social media channel as their sources of information, and 13 risk group participants (59.1%) had not mentioned

anything about social media as their sources of information about the Covid-19 pandemic. Of people who do not belong to a risk group, 26 participants (49.1%) had mentioned using some social media channels as their source of information, and 27 participants (50.1%) did not mention anything about social media channels. Of those in a risk group, 40.9% of the participants use social media, and of participants who do not belong to a risk group, 49.1% use social media, so the difference between these two groups is 8.2%.

Based on the results of qualitative analysis, a quantitative aspect was also analysed using the chi-square tests to see any statistical differences between these different groups. According to the chi-square test made about using social media as a source of information, there were no significant differences between people who belong to a risk group and people who do not belong to a risk group ($p>0.05$, see Table 8 in the appendix). The significance between the people who belong to a risk group and people who do not belong to a risk group, in this case, was 0.725, which means that the difference is not statistically significant.

Table 2: Use of social media in risk groups

		Uses social media	Haven't mentioned social media	Total
yes	Count	9	13	22
	% within Do you belong in risk group?	40.9%	59.1%	100.0%
	% of Total	10.2%	14.8%	25.0%
no	Count	26	27	53
	% within Do you belong in risk group?	49.1%	50.9%	100.0%
	% of Total	29.5%	30.7%	60.2%
i don't know	Count	7	6	13
	% within Do you belong in risk group?	53.8%	46.2%	100.0%
	% of Total	8.0%	6.8%	14.8%
Total	Count	42	46	88
	% within Do you belong in risk group?	47.7%	52.3%	100.0%
	% of Total	47.7%	52.3%	100.0%

5.1.3. Differences between genders

Table 3 presents the relationship between using social media as a source of information between different genders. From the total number of participants (88), there were 73 female (83%) participants and only 12 male (14%) participants. Three participants did not want to answer this part. The fact that 83% of the participants are female might somewhat affect the results. Thirty-six female participants mentioned that they use social media as their source of information, and 37 had not mentioned social media as one of their source of information about the Covid-19 pandemic. Of the male participants, four had mentioned using social media as their source of information, whereas eight participants did not mention social media. Thus, among the female participants, 49.3% uses social media, and among the male participants, 33.3% uses social media. Even though some percentual difference between male and female participants can be seen, it is impossible to claim that there are differences between genders based on this sampling because this sample included so few male participants.

According to the chi-square test made about using social media as a source of information, there were no significant differences between different genders ($p>0.05$, see Table 9 in the appendix). The significance between the female and male participants, in this case, was 0.472, which means that the difference is not statistically significant.

Table 3: Use of social media as a source of information: differences between gender

		uses social media	haven't mentioned social media	Total
female	Count	36	37	73
	% within Gender	49.3%	50.7%	100.0%
	% of Total	40.9%	42.0%	83.0%
male	Count	4	8	12
	% within Gender	33.3%	66.7%	100.0%
	% of Total	4.5%	9.1%	13.6%
don't want to say	Count	2	1	3
	% within Gender	66.7%	33.3%	100.0%
	% of Total	2.3%	1.1%	3.4%
Total	Count	42	46	88
	% within Gender	47.7%	52.3%	100.0%
	% of Total	47.7%	52.3%	100.0%

5.1.4. Reasons to use social media as a source of information

The first survey question about information source included a sub-question, which gathers information about why people choose their information sources. The additional question was:

a) Why do you choose these sources? People can have a need to receive different kinds of information, and both formal and informal information can be important.

Since this question was a sub-question to the first question, all participants did not answer why they choose a specific source of information. Here the answers were also categorised using thematic analysis, which is a form of qualitative analysis. There were 42 people (47.7%) that mentioned using at least one social media channel as their source of information. Eighteen (42.9%) of these were digital immigrants, and 24 (57.1%) were digital natives.

First, the answers that included mentions about using social media as a source of information were familiarised and colour-coded based on the answers that included reasons to use social media as a source of information. From the total 18 digital immigrants who had mentioned social media as their source of information, 10 (55.6%) had answered the sub-question "why they choose these sources?". Of the digital natives, 12 of 24 (50%) participants who mentioned social media as their source of information also mentioned why they choose these sources.

Figure 3 shows the number (n) of digital immigrants (18) and digital natives (24) who use social media as their source. Four themes came up in the answers to why the participants would choose social media. The most common answer among digital immigrants and digital natives was that their friends share information on social media, so they use social media as their source of information because of their friends. Also, family was mentioned in addition to friends. Therefore, all answers that included some mentions about family or friends were counted in this category.
One example of this kind of answer was from a digital immigrant:

> *Yle (mainly TV news and special broadcasts), the newspapers I subscribe to; the websites of international health organisations and the site of domestic THL [National Institute of Health and Welfare]; foreign digital magazines. Also, Facebook & personal email. Reason: so that I can maintain and date my own knowledge and my relatives and friends about the pandemic at home and abroad, and so that we can, together with my spouse, comply with the guidance of duty.*
> – Male, digital immigrant born in 1948

Five digital immigrants and seven digital natives had a mention about friends or family in their answers. Three digital immigrants and two digital natives had mentioned that the information is timely or easy/fast to find from social media. For example, one digital immigrant wrote this:

Yle, authorities, newspapers, twitter (social media). They are the easiest to access.

-Female, digital immigrant born in 1950

Two of the digital immigrants mentioned that they choose their sources because the information is international in these sources. Three digital natives mentioned that they get peer support from their sources of information. Of those digital immigrants who had mentioned using social media as their information source, eight participants did not explain why they choose it as their source. Of the digital natives who have mentioned using social media as their information source, 12 participants did not explain why they chose it.

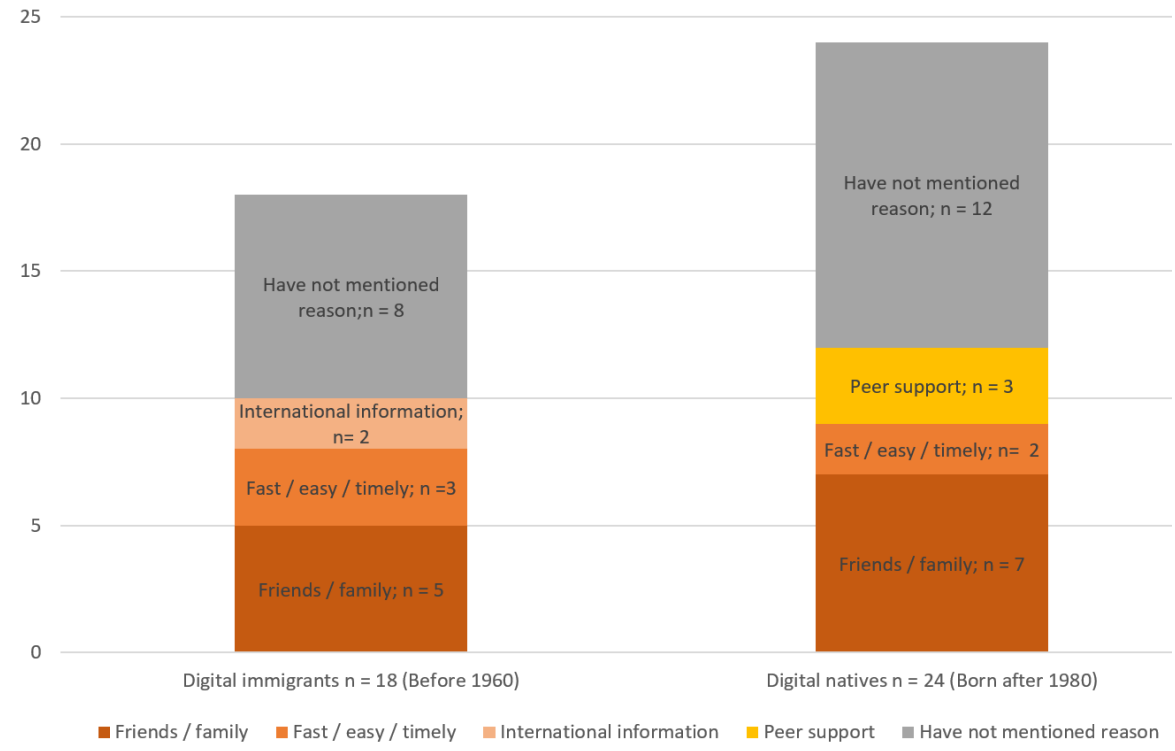

Figure 3: Reasons for using social media as source of information

5.2. Information overload

This part analyses the feeling of information overload and differences in how digital immigrants (born before 1960) and digital natives (born after 1980) experience information overload.
Data for analysing experiencing information overload are collected from the third question of the survey:

3) How do you cope with the amount of information/news about the corona situation (too much information, too little information)?

The answers that were counted as experiencing information overload included mentions about feeling stressed or anxious about the amount of information, feeling that there is too much information or experiencing that the amount of information is so large that they need to avoid it. Examples of answers that were counted as experiencing information overload are:

> *"I'm stressed about the amount of information I receive, but I try to limit the amount of information I receive based on what I estimate I need and what I estimate is necessary for my work and myself."*
> -Female, a digital immigrant, born in 1956

> *"There is too much information and disinformation. It gives me anxiety, so I only stick to certain sources of information."*
> -Gender unknown, a digital native, born in 1983

> *"Constant information about coronavirus from everywhere irritates. I watch the corona situation once a day from the pages of thl, and possibly the news. And I'll follow if any new restrictions come from the government. Otherwise, I'll try to close my eyes and ears and focus on something else."*
> -Female, a digital immigrant, born in 1956

5.2.1. Differences between digital immigrants and digital natives

Table 4 presents the experience of information overload among digital natives and digital immigrants. Overall, 45 people out of 88 participants (51.1%) have mentioned that they experience information overload on some level: they have either felt that there is too much information or felt stress or anxiety about the large amount of information. Of the 88 participants, 43 (48.9%) have not mentioned that they have felt information overload or stress and anxiety about the large amount of information. Some of the people who have not experienced information overload have also mentioned that it is good to have much information about the coronavirus. For example, one participant has written like this:

> *"I think it is good that there is much information - especially information and not beliefs that scare. Everyone does not have to follow everything along the day. News come in anyway in the media - radio, television, the Internet, for example - and I believe following "once in a while" is enough for now. (If the situation changes dramatically, the follow-up needs may change, but that's speculation even now.)*
> -Male, a digital immigrant, born in 1953

All of the participants that mentioned something about feeling the information overload or who had experienced information overload on some level have been counted to the "too much information/overload" column of table 4. The participants who have not mentioned that they experience information overload or do not feel that the amount of information is too much have been counted in the column "not too much information / no overload" column of table 4.

Table 4 presents that 25 out of 43 digital immigrants have mentioned that they experience information overload on a certain level. This is 58.1% of the digital immigrants overall. They have mentioned, for example, that they feel anxiety or stress about the amount of information or that they feel the need to avoid the information, or that there is simply too much information about the coronavirus. From the group of digital immigrants, 18 people (41.9%) have not mentioned that they feel information overload or see too much information about the coronavirus. The part of the group that does not see the large

amount of information as an issue has also mentioned that it is good to have much information.

Digital natives did not experience information overload as much as digital immigrants did. Of the 45 digital natives, 20 participants have mentioned that they either experience information overload on a certain level, or then they have told that there is too much information or that they get stressed about the amount of information. This is 44.4% of the digital natives overall. Of the digital natives, 25 people have not mentioned anything negative about the large amount of information and part of the digital natives also experiences the large amount of information as a good thing.

According to the chi-square test made about experiencing information overload, there were no significant differences between digital immigrants and digital natives ($p>0.05$, see Table 10 in the appendix) even though it seems that digital natives did not experience information overload as much as digital immigrants. The significance between the digital immigrants and digital natives, in this case, was 0.199, which means the difference is not statistically significant.

Table 4: Information overload: differences between digital immigrants and digital natives

		too much information /overload	not too much information /no overload	Total
Digital natives	Count	20	25	45
	% within Immigrants-natives	44.4%	55.6%	100.0%
	% of Total	22.7%	28.4%	51.1%
Digital immigrants	Count	25	18	43
	% within Immigrants-natives	58.1%	41.9%	100.0%
	% of Total	28.4%	20.5%	48.9%
Total	Count	45	43	88
	% within Immigrants-natives	51.1%	48.9%	100.0%
	% of Total	51.1%	48.9%	100.0%

5.2.2. Differences between risk group and not belonging to risk group

Different background variables between the participants were also tested, for example, are there differences in experiencing information overload depending on if they belong to a risk group or not. Most of the participants that belong to a risk group are digital immigrants, and some of them might be in the risk group based on their age. Table 5 presents the differences in experiencing information overload between the people in a risk group and those who do not belong to a risk group. Of those who belong to a risk group, 13 participants mentioned that they experience information overload on some level. This is 59.1% of the participants in a risk group overall. The people who were counted as experiencing information overload had mentioned that there is too much information, that they cannot handle the large amount of information, they avoid seeing information, or get stressed or feel anxiety about the amount of information. Of the participants who belong to a risk group, nine people did not mention that they would feel overloaded/stressed/anxious about the amount of information. This is 40.9% of the participants in a risk group.

Of the participants who do not belong to a risk group, 25 participants (47.2%) had mentioned something about information overload, and 28 participants (52.8%) did not mention anything about the large amount of information being an issue. Of those in a risk group, 59.1% of the participants experience information overload, and of the participants who do not belong to a risk group, 47.2% experience information overload, so there seems to be a percentual difference between people who belong to a risk group and people who do not belong to a risk group.

According to the chi-square test made about experiencing information overload, there were no significant differences between people who belong to a risk group and people who do not belong to a risk group ($p>0.05$, see Table 11 in the appendix), even though the percentual difference between these groups seems big. The significance between the digital immigrants and digital natives, in this case, was 0.628, which means that it is not statistically significant difference.

Table 5: Information overload in risk groups

		too much information /overload	not too much information /no overload	Total
yes	Count	13	9	22
	% within do you belong in risk group?	59.1%	40.9%	100.0%
	% of Total	14.8%	10.2%	25.0%
no	Count	25	28	53
	% within do you belong in risk group?	47.2%	52.8%	100.0%
	% of Total	28.4%	31.8%	60.2%
I don't know	Count	7	6	13
	% within do you belong in risk group?	53.8%	46.2%	100.0%
	% of Total	8.0%	6.8%	14.8%
Total	Count	45	43	88
	% within do you belong in risk group?	51.1%	48.9%	100.0%
	% of Total	51.1%	48.9%	100.0%

5.2.3. Differences between genders

Table 6 presents the relationships between experiencing information overload and different genders. Of the female participants, 39 mentioned that they experience information overload on some level, and 34 had not mentioned information overload. Of the male participants, three had mentioned information overload, and nine participants did not mention it. Of the female participants, 53.4% experience information overload and 25% experience information overload from the male participants. It can be seen that a clearly more significant percentage of female participants experienced information overload than male participants. However, this sample included very few male participants in total, which might affect the results.

The chi-square test showed a significant relationship between gender and experienced overload (chi-square=6.300, $p<0.05$, see Table 12 in the appendix). The significance between the digital immigrants and digital natives, in this case, was 0.043, which means

that the difference is significant. However, the small number of male participants might influence the chi-square test results, as well.

Table 6: Information overload between different genders

		too much information / overload	not too much information / no overload	Total
female	Count	39	34	73
	% within Gender	53.4%	46.6%	100.0%
	% of Total	44.3%	38.6%	83.0%
male	Count	3	9	12
	% within Gender	25.0%	75.0%	100.0%
	% of Total	3.4%	10.2%	13.6%
don't want to say	Count	3	0	3
	% within Gender	100.0%	0.0%	100.0%
	% of Total	3.4%	0.0%	3.4%
Total	Count	45	43	88
	% within Gender	51.1%	48.9%	100.0%
	% of Total	51.1%	48.9%	100.0%

5.2.4. Coping with the large amount of information

The third survey question about coping with the amount of information included a sub-question, which gathers information about participants' feelings concerning the large amount of information. The additional sub-question was:

a) What kinds of feelings do you have about the amount of information?

Since this question was a sub-question of the third question, all participants did not answer what kinds of feelings they have about the amount of information. Here the answers were also categorised using thematic analysis. There were 45 participants (51.1%) that mentioned experiencing information overload at least on a certain level or

had stress/anxiousness about the amount of information. Of these 45 participants, 25 were digital immigrants, and 20 were digital natives.

First, the answers that included mentions about information overload, that there is too much information to cope with or that the participants have negative thoughts about the amount of information were familiarised and colour-coded into one category. Second, the answers that included mentions about avoiding information were further collected into one category.

Figure 4 shows the number (n) of digital immigrants (43) and digital natives (45) and their feelings about the amount of information. A few participants mentioned several different feelings regarding the amount of information, and these participants have been counted into more than just one category.

Four different themes came up from the survey answers that included mentions of the feelings about the amount of information. The four themes were: It is good to have much information, the large amount of information is stressful, there is too little factual information, and there is too much information, I avoid it.

The most common answer among both digital immigrants and digital natives was that there is too much information, and the participants try to avoid it. Of the digital immigrants, 15 (34.9% of digital immigrants overall) and of the digital natives, 18 (40% of digital natives overall) had a mention about avoiding too much information in their answers.

For example, to the question "how do you cope with the amount of information", two digital immigrants wrote about restricting their own access to information following:

"I am rationing access to information; I'm only clearing the situation 2-3 times per day. Too much information distresses."
Female, a digital immigrant, born in 1960

"I have started limiting the reception of information to today's newspaper and TV or radio news. I will also watch the briefings of the government and the city of Helsinki."
-Female, a digital immigrant, born in 1959

However, participants from opposite views also think that getting much information about the subject is a good thing. This is why the theory of monitors and blunters is included in this study.

For example, one of the participants wrote this:

I am a news addict meaning that I daily follow several different news channels at home. Occasionally this somewhat distresses but I must keep up to date. There is a lot of conversations with my friends on WhatsApp between two persons or in groups. Information is must-be heard and received. I am interested in the information."
-Female, a digital immigrant, born in 1958

Of the digital immigrants, 14 (32.6%) and of the digital natives, 15 (33.3%) had mentioned that the large amount of information causes stress for them. Among the digital immigrants, nine (20.1%) had mentioned that it is good to have much information and six digital natives (13.3% of digital natives) felt the same way. Eight digital natives mentioned that they receive actually too little information, especially factual information. This means that 17.8% of the digital natives would hope to see even more factual information about the Covid-19 pandemic.

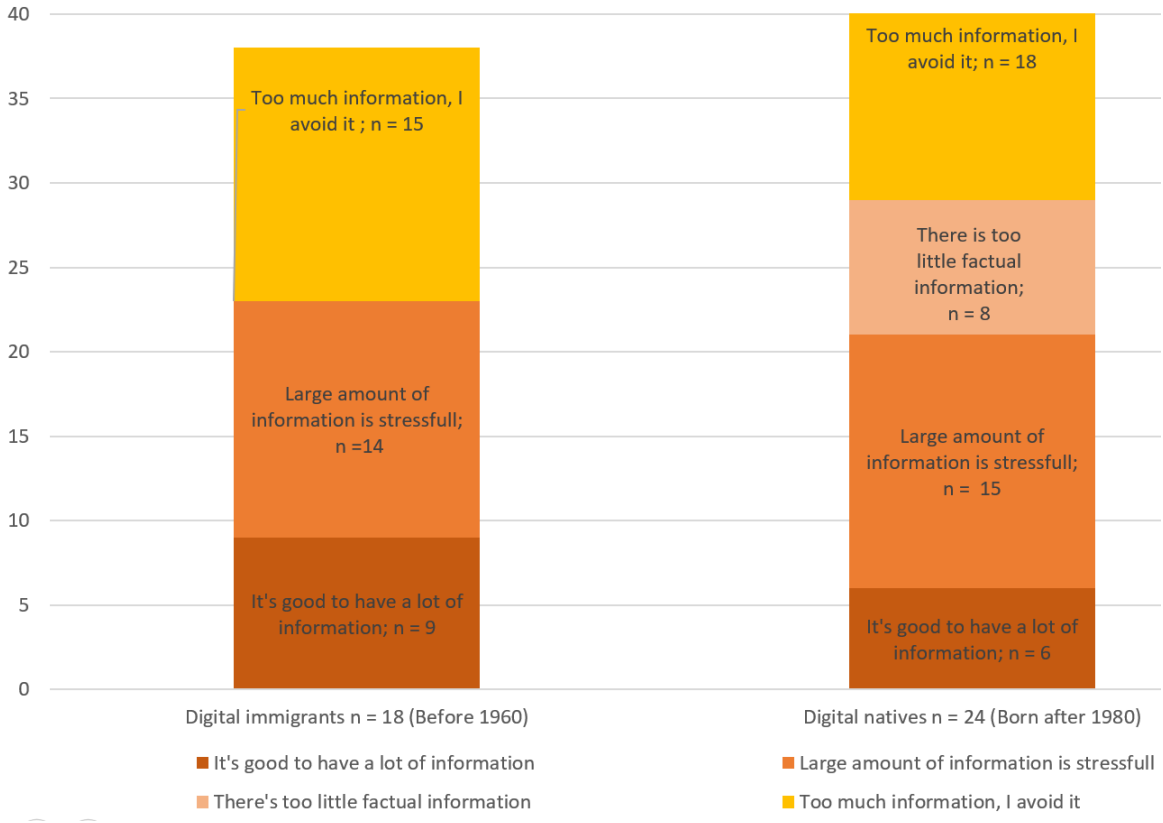

Figure 4: Feelings about the amount of information

5.3. Summary and analysis of the results

The analysis of the survey data to answer the research questions was done by thematic analysis, because the survey was structured with open questions. The main research question is: "Do people search for information about the Covid-19 pandemic in social media?" Of the total 88 included participants, 42 mentioned one or several social media channel as their source of information about the Covid-19 pandemic. This means that 47.7% of the participants in this sample use social media as their source of information. However, these answers included mentions from participants that they use social media merely to see what their friends have written about the subject, but they still did not consider social media as a reliable source of information even if they use them. With this sample, we could think that almost half of the people use social media as one of their

sources of information. All the participants who had mentioned using social media as their source of information had mentioned other sources as well.

The main research question was further divided into sub-questions, which focused on the differences between the two different age groups and on people's emotions about the amount of information. Two different age groups were compared: people born in 1960 or before and people born in 1980 or after. These two different age groups represent digital immigrants and digital natives. The sub-questions for this study were:

Q1: Are there differences concerning how many of the study participants uses social media as a source of information?
Q2: Are there differences concerning why they use social media?
Q3: Are there differences concerning whether they experience information overload?
Q4: Are there differences concerning whether they avoid information?

Q1: Are there differences concerning how many of the study participants uses social media as a source of information?

For the first sub-question, it could be seen that there were some differences between these two age groups. Out of a total of 43 digital immigrants, 18 mentioned using social media channels as a source of information. Out of a total of 45 digital natives, 24 mentioned using social media as a source of information. It means that about 40 percent of digital immigrants use social media as a source of information and over half of the digital natives use social media as a source of information. There was a percentual difference between these two groups, so with this sample it appears that digital natives use social media as a source of information more that digital immigrants do. However, in the chi-square tests that were made to see, if the difference between these groups is significant, the significance could not be proved.

Q2: Are there differences concerning why they use social media?

For the second sub-question, “Are there differences concerning why they use social media?”, no considerable differences could be identified between the two age groups. The sampling for this question was small, because only part of the participants used social media as their source of information and of them, everyone did not answer this optional question. For the question why people choose their sources, four themes were identified. There were quite similar percentages of digital immigrants and digital natives, who mentioned friends or family in their answers concerning the choice of source of information. Three digital immigrants and two digital natives mentioned that they choose their information sources because the information in these sources is timely, fast or easy to access. There were no major differences between digital immigrants and digital natives. Two digital immigrants had mentioned international information as a reason for choosing social media as an information source, whereas three digital natives had mentioned peer support as a reason for choosing social media. In this area, there are differences between digital natives and digital immigrants because digital immigrants use social media as a place to search for international information, while digital natives use social media as a source of information, because they receive peer support from there.

As was stated, the sampling for this question was small, because everyone did not want to explain why they choose their information sources. It is difficult to indicate clear differences between these two groups, due to the size of the sampling and the open-formed questions. However, it seems that the digital natives would use social media more to connect with people and have peer support, whereas the digital immigrants would use social media to obtain international information as well as to connect with their friends.

Q3: Are there differences concerning whether they experience information overload?

Overall, of the 88 participants, 45 mentioned something about information overload in their answers. Out of the total of 43 digital immigrants, 25 had negative feelings about the amount of information and were counted as the ones experiencing information overload. This means that the clear majority of the digital immigrants felt information overload. Of the overall 45 digital natives, 20 participants answered that they felt negatively about the amount of information and they were counted as the ones

experiencing information overload. This constitutes over 40 percent of the participating digital natives. It is striking that there are slight differences between the two age groups: digital immigrants might feel information overload more easily than digital natives do. The age difference might have affected this, because digital natives have grown up surrounded by large amounts of information and, that way, there is a possibility that they do not feel overwhelmed by the information as easily as digital immigrants do. However, the chi-square tests about the information overload did not show significant differences between the two age groups, even though it seems that there is a percentual difference between digital immigrants and digital natives.

Q4: Are there differences concerning whether they avoid information?

The survey question concerning peoples' feelings about the amount of information and coping with the amount of information was a wide question and the answers included many different mentions about avoidance of information. The fourth sub-question of this research was "Are there differences on whether they avoid information?". When researching the coping with large amount of information, 15 digital immigrants (about 35% of digital immigrants overall) and 18 digital natives (about 40% of digital natives overall) had mentioned that they avoid information, so there was just a slight difference between these two age groups but not significant differences between these two groups concerning the information avoidance. Even if it does seem by percentage as if digital natives are avoiding information slightly more than digital immigrants do, the responses of digital immigrants about the avoidance of information are still more direct and clearer from the perspective of information avoidance. Many digital immigrants have directly stated that they are avoiding information or restricting their own access to information.

Of the digital natives, there were participants who avoid and limit their access for information as well as participants who seek as much information as possible, which supports the theory of monitoring and blunting in this study. The number of the information avoiders and information seekers was quite the same between digital natives and digital immigrants.

6 DISCUSSION

After discussing the questionnaire findings in chapter five, this chapter aims to link the research results to the theoretical framework of this study to understand better the differences between digital immigrants' and digital natives' information behaviour during the Covid-19 pandemic. Also, this chapter aims to discuss the results in relation to previous research; if people search for information about the Covid-19 pandemic from social media and how they cope with the large amount of information.

6.1. Discussion of results in relation to previous research

Ever since the Covid-19 pandemic began, the amount of information related to the pandemic has been extensive and new information has constantly been coming from different sources. Since the beginning of the pandemic, there has been an extensive amount of research related to the coronavirus. For example, Siebenhaar et al. studied dealing with the Covid-19 crisis (Siebenhaar et al., 2020), whereas Pulido et al. studied the Covid-19 infodemic (Pulido et al., 2020). In addition, Poonia and Rajasekaran have studied the information overload aspect of the Covid-19 crisis (Poonia & Rajasekaran 2020), and Nielsen et al. studied how people access and rate news about Covid-19 (Nielsen et al., 2020).

The pandemic situation has inspired many researchers to study human information behaviour, and now the results of previous studies are reflected with the results of this present master's thesis study. This study offers insights into Finnish people's information behaviour during the Covid-19 pandemic. However, when assessing the data, it is important to remember that the number of included respondents in this study was 88 merely participants, and the findings could hence not be applicable to the whole population.

6.1.1. Differences between digital immigrants and digital natives

When studying the differences between digital immigrants and digital natives, this study included four sub-questions:

Q1: Are there differences concerning how many of the study participants uses social media as a source of information?
Q2: Are there differences concerning why they use social media?
Q3: Are there differences concerning whether they experience information overload?
Q4: Are there differences concerning whether they avoid information?

Around 40% of the digital immigrants and over half of the digital natives mentioned one or several social media channels in their reply. To answer the first research sub-question, it seems that digital natives would use social media a bit more than digital immigrants based on this sample. According to Prensky, digital natives think about and process information fundamentally differently from digital immigrants (Prensky 2001, a), which lead to the assumption that the difference between digital immigrants' and digital natives' social media use could be much more significant. The differences based on this sample were, however, not significant according to the chi-square test. However, the participants of this study are active users of the Internet because they were recruited to answer the survey through the Internet, mainly through social media channels. The difference between digital immigrants and digital natives could have been more significant if the answers were collected through a paper survey, for instance.

The answers to the second sub-question, "Are there differences in why they choose social media?" showed some differences between the two groups. Both groups had quite similar numbers of answers about family and friends, as well about the information being timely and easy or fast to get. However, digital natives used social media more to get peer support, whereas digital immigrants used social media more to read international information. That might indicate that digital immigrants use social media for different purposes than digital natives do. This can be linked to Prensky's vision about digital

immigrants and digital natives thinking differently about digital sources (Prensky, 2001 b).

The sub-question about the information overload aspect of the study also included a comparison between the two age groups. Almost 60% of the digital immigrants mentioned that they experience information overload on a certain level. Digital natives did not experience information overload as much as digital immigrants since only over 40% of the digital natives experienced information overload. The digital natives might feel a bit less information overload because, according to Prensky, they have grown up surrounded by the large amount of digital information, whereas digital immigrants have learned to adapt to the new digital environment (Prensky, 2001 a). However, the difference between digital immigrants and digital natives was not significant according to the chi-square test.

Information avoidance occurred in multiple answers when the participants were asked how they cope with the amount of information. Whereas 40% of the digital natives avoid information about Covid-19, this was the case for only about one-third of the digital immigrants. Even though the digital natives are used to the large amounts of digital information, they still seem to avoid information more than digital immigrants. That might be because most of the digital immigrants who participated in this survey belong to a risk group. According to the study done by Dreisiebner et al., people who belong to a risk group avoid information about the Covid-19 pandemic less than people who do not belong to a risk group do (Dreisiebner et al., 2020).

To conclude, there were no significant differences between the group of digital immigrants and the group of digital natives in this particular study. Prensky's theory about digital immigrants and digital natives can be seen as slightly straightforward, and the differences between digital immigrants and digital natives are not necessary as significant. However, this study has a limited number of participants from both groups, so it is impossible to generalise based on this study.

6.1.2. Covid-19-related information seeking from social media

The main question of this master's thesis study was to find out if people search for information about the Covid-19 pandemic from social media. The study done by Nielsen et al. in 2020 studied how people in six countries access and rate news and information about coronavirus, and their study included mentions about the use of social media. According to their study, in the United Kingdom and the United States, 47% of participants used social media as their source of information, whereas in Germany, only 39% use social media. Furthermore, in Spain, 63%, in Argentina, 78% and in South Korea, 51% of participants use social media (Nielsen et al., 2020). They suggested that the use of news was up in all six countries, with most people in most countries using social media, search engines, video pages, and chat apps (or variations of these) to get news and updates about the coronavirus (Nielsen et al., 2020). In this present master's thesis study, nearly 48% mentioned one or several social media channels that they use as an information source, so almost half of the respondents in this survey uses social media. A slight majority have not mentioned any social media sites as their source of information. Compared to the study done by Nielsen et al., it would seem that the United States and the United Kingdom have similar percentages of social media use as in this present study, whereas Germany has a lower percentage and Spain, Argentina, and South Korea have considerably higher percentages of using social media than this study. So, it can be seen that this study somewhat links with their results.

However, because of the open form of the survey questions, we cannot know that the participants who have not mentioned social media as a source of information do not use it at all. They might use social media as a source as well, but have decided not to mention it in the questionnaire. In this case, all of the respondents who did not mention anything about social media were divided into the category "Have not mentioned social media" and were interpreted as not using social media.

The study done by Soroya et al. provided interesting findings of information behaviour in the Covid-19 crisis, as well. Their study suggests that Finnish people do not prefer social media and personal networks when choosing information sources but instead want

to have trustworthy information from official sources (Soroya et al., 2021). However, in their study, the participants were part of a university with educational qualifications, which might affect the results. The study included answers from students, staff, and faculty members of three universities (Soroya et al., 2021). The findings of this study do not correlate very well with their study because almost half of the people use social media, according to this sample.

In the study by Nielsen et al., it was as well mentioned that young people and people with a low level of education use social media as their source of information a lot more than older people with higher education (Nielsen et al., 2020). However, in this present master's thesis study, the educational level of the participants was not taken into account, and the difference between the two age groups was merely small, even though digital natives might use social media as an information source more than digital immigrants. Based on the survey results of this study, about 42% of the digital immigrants use social media as a source of information compared to over 50% of digital natives. However, the chi-square test did not show any significant differences between these two groups.

The other background variables tested in this study were belonging or not belonging to a risk group and gender. There were no significant differences between these groups either, even though people who do not belong to a risk group used social media slightly more than participants who belong to a risk group. Most of the participants who belong to a risk group were digital immigrants, so the difference was quite the same as when comparing the digital immigrants and digital natives. Between genders, there were more differences, since almost half of the female participants use social media, but of male participants, about 30% uses social media. However, there were so few male participants in this study that the percentage does not necessarily indicate the true divide between men and women. This result still links with earlier studies, since a study done by Duggan and Brenner in 2013 indicated that 62% of males use social media sites and 71% of females use social media sites, meaning that according to their study, females use social media more compared to male participants (Duggan & Brenner, 2013).

Cuello-Garcia et al. studied social media use in the Covid-19 pandemic, and they suggested that health workers and scientists should engage in social media more to share accurate information about the coronavirus (Cuello-Garcia et al., 2020). A similar expectation could be seen among the respondents of the present study as well because some participants were hoping to see even more factual information about the Covid-19 pandemic in different channels. However, among the respondents of this survey, it was seen that social media was only seen as a place where "normal people" share information, and the official social media sites of health organisations were not taken into account.
In the study by Soroya et al., they suggested that people do not trust the information in social media, and that is why they choose not to use social media as a source of information (Soroya et al., 2021). Similar thoughts could be seen among the respondents of this present study as the people who did not choose social media as their information source stated in their answers that they like to read information only from trusted sources. However, reasons to choose social media as an information source according to the respondents in this study were friends and family, whereas others wanted to find information quickly and easy. In addition, others wanted to have peer support and international information from social media. Soroya et al. also found that information in social media has a strong correlation with information overload.

6.1.3. Information overload in the Covid-19 crisis

The respondents who were counted to be experiencing information overload provided mentions that they receive too much information, that they cannot handle all the information, or cannot cope with such a large amount of information. This is because information overload can be defined as a "state of an individual or system in which excessive communication inputs cannot be processed, leading to a breakdown." (Rogers 1986, p. 181). The answers that included mentions about feeling stressed or anxious about the amount of information were, as well, counted as experiencing information overload. According to the study done by Soroya et al., information overload correlates to a great extent with information anxiety (Soroya et al., 2021).

Overall, slightly more than one-half of the participants in this present study mentioned that they experience information overload on some level. Digital immigrants experienced information overload slightly more than digital natives did, and participants who belong to a risk group experienced somewhat more information overload than people who do not belong to a risk group did. However, there were no significant differences between the different groups concerning age and belonging to a risk group. However, gender did show a significant difference, while more than half of the female participants experienced information overload compared to only 25% of male participants. It still needs to be highlighted that there were only 12 male participants included.

Mohammed et al. studied the assessment of Covid-19 information overload among the general public. Their study found that Covid-19 information overload is common among the general population. The information overload about Covid-19 information substantially correlated with the source of information and the frequency with which Covid-19 information was received (Mohammed et al., 2021). This master's thesis study did not examine the frequency of received information, but from the respondents of this survey, we can see that over half of them experience information overload about Covid-19.

6.1.4. Monitoring and blunting coping styles in the Covid-19 crisis

Among the respondents of the survey, there were examples of both coping styles, monitoring and blunting. Some respondents wrote that they need large amount of information and that they feel better when they read much information about the Covid-19 situation, whereas others wrote that Covid-19-related information gives them anxiousness and they avoid seeing it.

In the study done by Soroya et al., they found that people who felt information anxiety avoided further Covid-19-related information (Soroya et al., 2021). Similar answers were found in this study since most of the participants who mentioned avoiding information mentioned also having anxiousness or stress about the large amount of information or the

Covid-19-related information overall. Of the total 88 included participants, 33 (about 38%) wrote about information avoiding in their responses.

In the study done by Dreisiebner et al., only 4% of the participants reported having actively avoided reports and information about the Covid-19 pandemic (Dreisiebner et al., 2020). Of people who belong to a risk group, none reported having actively avoided information and reports on Covid-19 in the study by Dreisiebner et al. (Dreisiebner et al., 2020). Even though their study has quite different outcome about information avoidance than this study, in this master's thesis study, the active and passive forms of information avoidance were not considered, but all the answers including mentions about avoidance of information, were counted as avoiding information. That might affect the outcome of information avoiders in this study.

According to the study done by Siebenhaar et al., information avoidance is more common among the participants who do not trust the information about the Covid-19 pandemic. With people who trusted the information and had higher eHealth literacy, the information avoidance was not as common (Siebenhaar et al., 2020). The same kinds of answers could be seen from the respondents of this survey because some people who wrote that they avoid information also wrote that there is much false information.

6.2. Critical review

As is typical for most studies, this master’s thesis also has its limitations that need to be addressed. The number of respondents included in this master’s thesis study was quite small, 88 participants in total. There were answers in three different languages, but only the answers in Finnish were included in this study. The reason why all of the answers were not included was that to gain understanding about differences between digital immigrants and digital natives, samples of the same size were needed. There were 45 participants born in 1980 or after that, who could represent the digital natives. According to Prensky’s theory, people born before 1980 are digital immigrants (Prensky, 2001 a). In order to find a sample of nearly the same size as the group of digital natives, the people born in 1960 and before that were included in the study. Hence, the answers from people

born between 1961 and 1979 were excluded. In order to gain a better understanding of Covid-19-related information behaviour, a larger number of the answers would have been needed. However, with the open form of the survey questions, a large number of answers would have been more difficult to examine, and the research could have been too wide for a master's thesis study.

Different background variables were tested to gain knowledge about relationships between the different groups. In this study, the different variables tested were age, whether or not the participant belongs to a risk group, and gender. However, it turned out that most of the participants who belong to a risk group were digital immigrants and most of the participants who did not belong to a risk group were digital natives. Of course, there were some exceptions, but examining risk groups gave somewhat similar results as examining differences between the digital immigrants and digital natives. Also, there were so few male participants that the results of testing differences between male and female participants should be treated cautiously. There were more background questions that could have been used as variables to search for relationships between the groups. For example, the occupational background or the place of residence could have been tested. For instance, Nielsen et al. found that education has an effect on where people search for their information about the Covid-19 pandemic (Nielsen et al., 2020).

The quantitative aspect of this study was done by using chi-square tests. The different variables, such as gender, age and whether the participant belongs to a risk group or not, were tested. However, the chi-square tests only showed significant differences for one of these variables, and that also for one aspect. Only when studying the information overload aspect, female participants experienced significantly more information overload than male participants did. However, as said, the number of male participants was small, and the significance should be treated with caution. To conclude, the chi-square tests were not the optimum way to examine such a limited number of responses. The responses could have been examined more specifically using different kinds of qualitative analysis methods or, from quantitative methods, descriptive statistics could have been used.

The survey also included a question about false information and it could have been studied how the experiences of false information correlate with information anxiety and then information overload which can lead to information avoidance. This was initially thought of, when this master's thesis was planned, but in the end left out so that the area of research would not become too wide.

7 CONCLUSIONS

This chapter concludes the findings of this master's thesis study and gives ideas for future research. The purpose of this master's thesis was to create a better understanding of people's information behaviour during the Covid-19 pandemic and to see if they use social media as their source of information about the pandemic and how they cope with the large amount of information. This master's thesis also strove to find differences in the information behaviour of digital natives and digital immigrants.

7.1. Key findings

It is important to recognise that the study only considered the responses of 88 participants, which means that the results reached cannot be generalised to a wider population of people. Furthermore, this study only examines the Finnish language responses to the questionnaire, and people's information behaviour can vary greatly in other areas of the world. Having said that, the findings also provide a general understanding of how people respond to the vast volume of information about Covid-19 and whether or not they use social media as a source of information. There were some themes to look for, but some responses were entirely unique.

Firstly, we determined that almost half of participants (47.7%) included in this study use social media as one of their sources of information about Covid-19. There were many different reasons to use social media as a source of information, but four main themes emerged in the answers. Some participants used social media because of their friends or family, whereas others used it to obtain timely information quickly or easily. Some participants also mentioned that they use social media to obtain international information and others used it for peer support.

Secondly, we found that over half (51.1%) of the participants included in this study experienced information overload to a certain degree. The question about coping with the amount of information received many different kinds of answers and four themes emerged. Some participants thought that it is good to have plenty of information, whereas

others found the large amount of information to be stressful or to cause anxiety. There were participants who felt that there is too much information and they need to avoid it, whereas some respondents said that there is actually too little information, especially factual information.

Thirdly, what was interesting to see was that there were no major differences between digital natives and digital immigrants based on this sample. Digital natives used social media slightly more than digital immigrants did, whereas digital immigrants experienced somewhat more information overload than digital natives did.

Fourthly, when studying the quantitative aspect of the research using chi-square tests, almost no significant differences could be identified between the background variables tested. Differences between the age groups were not significant concerning social media usage or information overload. Also, belonging to a risk group or not did not show any significant differences in social media usage or experiencing information overload. Differences between genders were not significant in using social media, but female participants did experience information overload significantly more than male participants did. However, the small number of male participants can affect the results.

Fifthly, when information avoidance was studied, there were answers that included both monitoring and blunting coping mechanisms. There were answers that included mentions about avoiding of information because it is too stressful, but also answers where the participants said that they read as much information as possible. Overall, 37.5% of the respondents mentioned avoiding information to some extent.

7.2. Suggestions for future research

Concerning the survey this study got the data from, there is a lot more data to study. This study only used 88 answers of the survey and only the answers given in Finnish, so the conclusions drawn from these results are not applicable to the entire population. In other words, it could be needed to take into account a more significant number of responses from the survey in order to form a more accurate picture of Covid-19-related information

behaviour. However, the smaller number of responses allowed for the study to be conducted partially qualitatively. Since there are many more survey responses, the social media usage or information overload aspects could be studied more widely.

One aspect is that there were answers in three different languages in this dataset. Therefore, the responses could be studied in three different languages and examine if there are differences between the Finnish, Swedish or English answers. This could be possible with Finnish and Swedish answers since the survey includes enough answers this kind of study would require.

Also, the aspect of false information could be studied since the survey included a question about how the participants experience false information related to the Covid-19 pandemic. It could be interesting to study the relationship between false information and information anxiety. The correlation between information anxiety and information avoidance could also be studied further based on this survey data.

Finally, the situation with the Covid-19 pandemic is still ongoing, and it has now been a year since the survey was conducted. Therefore, at the moment, the answers to the same questions about Covid-19-related information could be very different, so the survey could be reimplemented to permit for comparison of the answers when a year has passed between the surveys.

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APPENDICES

1. Appendix: Survey in English

E-lomake / Webropol:

1. Background information
   - Year of birth (free writing, limited to 4 characters)
   - Gender (female, male, wish not to tell) (choose one)
   - City or municipality (free writing field)
   - Are you
     - comprehensive school student
     - upper secondary level student
     - student
     - employed
     - self-employed
     - unemployed
     - homemaker
     - retired
   - In which language(s) do you seek/get information?
   - Do you belong to a risk group? (yes/no/I don't know)
   - Have you or someone in your immediate environment been diagnosed with the coronavirus disease? (yes/no/I don't know)

1) From where do you get information/news about the corona epidemic at the moment? How do you update yourself about the corona situation?
(For example, government health services websites, yle news on television and/or radio, on websites, newspapers, friends, relatives, social media such as Facebook, Instagram, Youtube, Whatsapp, Snapchat, TikTok etc.)?

a) Why do you choose these sources? People can have a need to receive different kinds of information, and both formal and informal information can be important.

2) Is false/unreliable information about the corona situation a problem for you (for example rumors, misunderstandings, misleading information (disinformation) or contradicting information)?

a) Why is it a problem?

b) How do you evaluate the reliability of the corona information or news?

3) How do you cope with the amount of information/news about the corona situation (too much information, too little information)?

a) What kinds of feelings do you have about the amount of information?

4) Can you give us 1-2 examples of good and 1-2 examples of bad experiences regarding the information about the corona epidemic.

5) Any other experiences you would like to share regarding corona information in general?

2. Appendix: Survey in Finnish

E-lomake / Webropol:

1. **Perustiedot**
    - Syntymävuosi
    - Sukupuoli
    - Asuinkunta tai -kaupunki
    - Oletko
        - peruskoululainen
        - toisen asteen opiskelija
        - opiskelija
        - työssä
        - yrittäjä
        - työtön
        - kotiäiti/-isä
        - eläkeläinen

    - Kielet, joita käytät kun haet ja vastaanotat (esim. luet, katsot, kuuntelet) tietoa koronaviruksesta.
    - Kuulutko riskiryhmään? (kyllä/en/en tiedä)
    - Oletko sinä tai joku lähipiirissäsi saanut positiivisen koronadiagnoosin? (kyllä/ei/en tiedä)

1. Mistä saat tällä hetkellä tietoa koronaepidemiasta ja mitä kanavia seuraat? Miten pidät itsesi ajan tasalla koronaepidemiasta? (esim. terveysviranomaisten www-sivut, Yle, tv-/radiouutiset, sanomalehdet, ystävät, perheenjäsenet, sosiaalinen media kuten Facebook, Twitter, Instagram, Whatsapp, Snapchat, TikTok tai jokin muu palvelu)

a) Miksi käytät näitä lähteitä/kanavia? Ihmisillä voi olla tarve saada erityyppistä tietoa ja sekä virallinen että epävirallinen tieto on tärkeää.

2. Onko väärä tieto koronaepidemiasta sinulle ongelma (esim. huhut, väärinymmärykset, harhaanjohtava (disinformaatio), ristiriitainen tieto)?

   a) Miten se on ongelma?

   b) Miten arvioit kohtaamasi tiedon luotettavuutta?

3. Miten selviydyt koronaan liittyvän tiedon määrän kanssa tässä tilanteessa? Onko tietoa liian paljon tai liian vähän?

   a) Minkälaisia tunteita tiedon määrä sinussa herättää?

4. Kuvaile 1-2 hyvää ja 1-2 huonoa kokemustasi liittyen tietoon koronaepidemiasta.

5. Onko sinulla muita kokemuksia koronaepidemiaan liittyvästä tiedosta, joista haluat kertoa?

Kiitos vastauksistasi!

3. Appendix: E-mail to participants in English

Corona - information and emotions

Information Studies in Åbo Akademi University launches a short survey to collect research material during the Emergency Power Act caused by the coronavirus.

The survey is open 24.3.–15.5.2020

The everyday life in Finland changed drastically in March 2020 when the government declared Emergency Powers Act to be in effect because of the global coronavirus pandemic (COVID-19). There is a lot of information available right now about the corona epidemic and we are interested in hearing particularly your experiences of the flow of information in this new situation.

From where do you get the information you need? How do you handle the amount of information? How do you evaluate the reliability of the information? All the experiences are valuable and help us to better understand your attitude to information during a state of emergency.

Participating in this study is anonymous and all possible references to identification of persons will be removed from the material. Materials will be stored in the Finnish Social Science Data Archive (FSD) so that it can be used broadly according to the open science recommendations, www.fsd.tuni.fi

Additional information from professor Gunilla Widén, Åbo Akademi University, Information studies, gunilla.widen@abo.fi
You can answer the survey through an online form. The survey contains a few background questions and five main questions. You can choose how many questions you want to answer and both short and longer answers are welcomed.

(Link)

4. Appendix: Email to participants in Finnish

Korona - tieto ja tunteet

Åbo Akademin informaatiotutkimuksen oppiaine kerää lyhyen kyselyn avulla aineistoa kokemuksista, koronaepidemiaan liittyvästä tiedonkulusta valmiuslain ajalta.

Kysely on auki 24.3.–15.5.2020

Suomalaisten arki muuttui merkittävästi maaliskuussa 2020, kun Suomen hallitus julisti poikkeustilan Covid-19-koronavirusepidemian takia. Juuri nyt on tarjolla paljon tietoa koronaepidemiasta ja me haluamme kuulla sinun kokemuksiasi tiedonkulusta tilanteessa, joka on uusi meille kaikille. Mistä saat sen tiedon, jota tarvitset, miten käsittelet tiedon määrää ja miten arvioit tiedon luotettavuutta? Kaikki kokemukset ovat arvokkaita ja auttavat meitä paremmin ymmärtämään suhtautumista tietoon poikkeustilan aikana.

Osallistuminen tapahtuu nimettömästi ja tutkimusaineistosta poistetaan kaikki mahdolliset viitteet, joista voi tunnistaa yksittäisiä henkilöitä. Aineisto kerätään avoimen tutkimuksen periaatteita noudattaen Yhteiskuntatieteelliseen tietoarkistoon, jossa se on avoimesti saatavilla eri tarkoituksiin tutkimuksen jälkeen. www.fsd.tuni.fi

Lisätiedot: Professori Gunilla Widén, Åbo Akademi, informaatiotutkimus, s-posti: gunilla.widen@abo.fi

Voit vastata kyselyyn alla olevan linkin kautta. Kysely sisältää muutaman taustakysymyksen lisäksi viisi pääkysymystä. Voit valita kuinka moneen kysymykseen vastaat. Sekä lyhyet että pidemmät vastaukset ovat tervetulleita.

(Link)

5. Appendix: Quotations from survey and their translations in the text

”Tv/radio sosiaalinen media sanomalehti paikallinen olen tottunut käyttämään näitä kanavia ja ovat minun mielestä luotettavia.” / “TV/radio social media newspaper (local). I'm used to using these channels and they are in my opinion reliable”
– Female, digital immigrant born in 1946

“Facebook, Instagram, Whatsapp, BBC, CNN, YLE, Tv-uutiset, sanomalehdet, Ystävät, perheenjäsenet” / “Facebook, Instagram, WhatsApp, BBC, CNN, YLE, TV news, newspapers, friends, family members”.
– Female, digital immigrant born in 1948

Yle (lähinnä tv-uutiset ja erikoislähetykset), tilaamani sanomalehdet; kansainvälisten terveysjärjestöjen sivustot ja kotimaisen THL:n sivusto; ulkomaiset digilehdet. Myös Facebook. Henk.koht. sähköposti. Syy: jotta voin ylläpitää ja päivättää omaa ja läheisteni tietoutta pandemiasta kotimaassa ja ulkomailla, ja jotta voimme yhdessä puolisoni kanssa noudattaa viransomaisohjeita, niistä mitenkään tinkimättä. / Yle (mainly TV news and special broadcasts), the newspapers I subscribe to; the websites of international health organisations and the site of domestic THL; foreign digital magazines. Also, Facebook & personal email. Reason: so that I can maintain and date my own knowledge and that of my relatives and friends about the pandemic at home and abroad, and so that we can, together with my spouse, comply with the guidance of duty.
– Male, digital immigrant born in 1948

“Stressaannun tiedon määrästä, mutta yritän rajoittaa vastaanottamani tiedon määrää sen perusteella mitä arvioin tarvitsevani ja minkä arvioin olevan välttämätöntä työni ja itseni kannalta.” / “I'm stressed about the amount of information I receive, but I try to limit the amount of information I receive based on what I estimate I need and what I estimate is necessary for my work and myself.”
-Female, digital immigrant born in 1956

”Tietoa ja disinformaatiota tulee liian paljon. Se ahdistaa, joten pitäydyn vain tietyissä tiedonlähteissä.” / “There is too much information and disinformation. It gives me anxiety, so I only stick to certain sources of information.”
-Gender unknown, digital native born in 1983

”Joka tuutista ja jatkuvasti tuleva koronahössötys ärsyttää. Katson kerran päivässä koronatilanteen thl:n sivuilta ja mahdollisesti uutisista. Ja seuraan, jos hallitukselta tulee uusia rajoituksia. Muuten koetan sulkea silmäni ja korvani ja keskittyä johonkin muuhun.” / Constant information about coronavirus from everywhere irritates. I watch the corona situation once a day from the pages of thl, and possibly the news. I also follow if any new restrictions come from the government. Otherwise, I try to close my eyes and ears and focus on something else.
-Female, digital immigrant born in 1956

"Minusta on hyvä, että tietoa - nimenomaan tietoa eikä pelottelevaa luuloa - tulee paljon. Kaikkea ei ole pakko seurata pitkin päivää. Uutisia tulee muutenkin mediassa - esimerkiksi radio, televisio, internet - pitkin päivää ja uskon ""silloin tällöin"" seuraamisen riittävän toistaiseksi. (Jos tilanne muuttuu dramaatisesti, voi seurantatarvekin muuttua, mutta se on spekulaatiota vielä nyt.) Tunne tiedon määrän suhteen on hyvä ja turvallisuutta luova." /“I think it is good that there is much information - especially information and not a beliefs that scares. Everyone does not have to follow everything along the day. News come in anyway in the media - radio, television, Internet, for example - and I believe following " once in a while” is enough for now. (If the situation changes dramatically, the follow-up needs may change, but that's speculation even now.)
-Male, digital immigrant born in 1953

”Yle, viranomaiset, sanomalehdet, twitter. Ne ovat helpoimmin saavutettavia.” / ”Yle, authorities, newspapers, twitter (social media). They are the easiest to achieve.”
-Female, digital immigrant born in 1950

”Säännöstelen tiedonsaantia, selvitän tilannetta vain 2-3x/vrk. Liika tieto ahdistaa.” / “I am rationing access to information; I'm only clearing the situation 2-3 times per day. Too much information distresses.”
-Female, digital immigrant born in 1960

”Olen alkanut rajoittaa tiedon vastaanottoa päivän lehteen ja tv- tai radiouutisiin. Katson myös hallituksen ja Helsingin kaupungin tiedotustilaisuudet.” / “I have started limiting the reception of information to the day's paper and TV or radio news. I will also watch the briefings of the government and the city of Helsinki.”
-Female, digital immigrant born in 1959

”Olen uutisaddikti eli seuraan päivittäin useista eri kanavista kotonauutisia. Toisinaan tämä jonkin verran ahdistaa mutta on pysyttävä ajan tasalla. Ystävien kanssa tulee paljon keskustelua whatsappissa kahden kesken tai ryhmissä. Tietoa on pakko kuulla ja saada. Se kiinnostaa.” / I am a news addict meaning I follow daily several different news channels at home. Occasionally this somewhat distresses but I must keep up to date. There is a lot of conversations with my friends on WhatsApp between two or in groups. Information is must-be heard and received. I am interested about the information.”
-Female, digital immigrant born in 1958

6. Appendix: Chi-square tests of different variables

Table 7: Chi-square tests about social media usage between digital immigrants and digital natives

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1,160[a]	1	0,281		
Continuity Correction[b]	0,746	1	0,388		
Likelihood Ratio	1,163	1	0,281		
Fisher's Exact Test				0,296	0,194
Linear-by-Linear Association	1,147	1	0,284		
N of Valid Cases	88				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20,52.					
b. Computed only for a 2x2 table					

Table 8: Chi-square tests about social media usage in risk groups

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	,643[a]	2	0,725
Likelihood Ratio	0,645	2	0,724
Linear-by-Linear Association	0,613	1	0,434
N of Valid Cases	88		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6,20.			

Table 9: Chi-square tests about social media usage between genders

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1,502[a]	2	0,472
Likelihood Ratio	1,531	2	0,465
Linear-by-Linear Association	0,068	1	0,794
N of Valid Cases	88		
a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 1,43.			

Table 10: Chi-square tests about information overload between digital immigrants and digital natives

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1,650[a]	1	0,199		
Continuity Correction[b]	1,148	1	0,284		
Likelihood Ratio	1,656	1	0,198		
Fisher's Exact Test				0,210	0,142
Linear-by-Linear Association	1,632	1	0,201		
N of Valid Cases	88				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 21,01.					
b. Computed only for a 2x2 table					

Table 11: Chi-square tests about information overload in risk groups

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	,929[a]	2	0,628
Likelihood Ratio	0,933	2	0,627
Linear-by-Linear Association	0,227	1	0,634
N of Valid Cases	88		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6,35.			

Table 12: Chi-square tests about information overload between genders

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6,300[a]	2	0,043
Likelihood Ratio	7,596	2	0,022
Linear-by-Linear Association	0,008	1	0,928
N of Valid Cases	88		
a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 1,47.			