

The Tromsø Study: Lessons Learnt About Searching for Information About Health and Illness

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Abstract. Introduction: Norway has a high use of e-health. Methods: This paper summarizes and discusses the published data from the Tromsø 7 Study, conducted between 2015 and 2016, focusing on e-health utilization in the Norwegian population aged 40 and above. Results: More than half of the participants reported using the Internet for health purposes. The main channels for obtaining information were search engines, apps, social media platforms, and online videos. The respondents frequently acted upon the information obtained online, and online health information influenced decisions regarding healthcare utilization and treatment management. Most respondents indicated a positive reaction to the information found online. Conclusions: The Tromsø 7 Study highlights the widespread utilization of e-health in Norway. The study also emphasizes the significant impact of e-health on individuals' decision-making processes related to their health. The findings suggest that the use of e-health overall does not replace the use of traditional health services, but rather functions as a supplement. Most respondents report positive reactions to online health information, highlighting the importance and relevance of e-health in modern healthcare practices.

Keywords. E-health, health information, information searching, health literacy, knowledge extraction

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1. Introduction

Norway and the other Nordic countries have a high use of e-health services and tools [1]. Some types of implemented e-health solutions in the Norwegian health services are electronic health records, videoconferencing and secure email for meetings and consultations, electronic prescriptions, and the online booking of consultations [1-3]. However, the highest volume in use of e-health in Norway is still likely to be for obtaining information about health and illness including on topics such as exercise, dieting, and complementary medicine [3].

While the use of e-health in general seems high, there is still a digital divide, in that some do not use the available technologies [1]. Reasons for this divide might be that some people are unable to use e-health, for instance because of illness or old age, some might be unaware of the services, some might lack sufficient training in using such services, and some might not trust the services [1,4]. Obtaining more exact information about the characteristics of e-health users (and of non-users) was an important impetus for the e-health study in the Tromsø 7 study.

The Tromsø Study is Norway's largest population study [5]. Participants fill in questionnaires, and are subjected to lab tests and physical examinations at a study-center. The sample of the study is the 70,000 population of the subarctic city of Tromsø in North Norway. More than 45,000 persons have participated since its inception in 1974 [5]. The most recent version (Tromsø 7) was conducted in 2015-2016, and 18,497 people aged 40 or above, 65% of those invited, participated. The Tromsø 7 survey included a questionnaire on e-health, which we summarize the main findings of below.

A main advantage of this type of population-based survey is that a large amount of data is sampled from a high number of people. This gives a high statistical power and allows for the detailed examination of the importance issues that other designs might not be able to address.

2. Methods

While various findings on e-health from the Tromsø 7 study have been published, an overview of the contributions of this study to the literature on searching for health information is still lacking. In the present paper, we summarize previous findings on e-health from the Tromsø 7 study, and discuss implications of these insights.

3. Results

A main finding was that 52.7% of the population 40 years and older had used the Internet for health purposes during the last year. By performing regression analyses, we found that central predictors of e-health use were female gender, younger age, higher education, higher income, not living with a spouse, having seen a GP in the last year, and having had some disease (heart disease, cancer, asthma, etc.) [6].

When asked about where they searched for information about health and illness, most (49.2%) responded search engines, such as Google. Fewer searched for this information on health apps (13.5%), social media such as Facebook (7.3%), and video services such as YouTube (5%) [6].

We also asked the respondents whether or not they had acted on the information they had found, and a little more than half (58%) of those who had searched for information had taken some form of action, including having made the decision to see or not see a doctor, discussed the information with a doctor, changed medication without seeing a doctor, sought complementary treatment, or made lifestyle changes. Performing a regression analysis, we found quite similar predictors as for searching for health information [but income and civil status were not significant predictors here] [6].

When we checked if there were any differences in the use of the technologies between different groups of patients, some patterns did emerge. For instance, people who had responded that they had some type of mental disorder or psychological problem had a significantly increased use of all types of technologies (apps, search engines, video, social media) compared to other patient groups. Patients with cardiovascular disorders tended to use apps and social media more than others, while those suffering from cancer had a higher use of search engines [7].

Another topic that we asked the participants about was how they reacted to the information they found. A clear majority stated that they had positive reactions to this process, and 72.4% felt more knowledgeable while 47.5% felt more reassured [8]. These positive feelings were predicted by a higher level of education. On the other hand, a minority stated that they had experienced negative reactions after searching for health information, and 25.7% felt more anxious while 27.9% felt more confused. The negative reactions were predicted by a low self-reported health status and not having enough friends who could provide help and support [8].

Furthermore, we checked whether searching for health information online impacted the decision to visit a physician [9]. In sum, we found that this was the case: both the decision to visit and not to visit a physician were associated with the use of search engines, video services, health apps and social media. However, the role of social media seemed to be more important for women than for men. The association of health information seeking with the decision *to visit* a physician was slightly stronger than the association with the decision *not to visit* a physician, which could imply that the use of e-health services is associated with a resultant *increase* in physician visits [9].

4. Discussion

To our knowledge, the Tromsø 7 Study is the only population-based study that has included a questionnaire on e-health. This means that the data obtained from this study are unique in their representativity of the Norwegian general population above 40 years and in their statistical power.

In the section above, we have summarized some of the main findings of the Tromsø 7 Study on e-health. A little above half of the population of 40 and above had used e-health in the last year. Our findings can be understood in light of the general use of health services in Norway. Women are higher users also of traditional health services in Norway [10,11], so it might be expected that women also use e-health more. Younger people as well as people with higher income and education are more likely to use new technology in general [12], and this holds also for e-health. Being ill and having seen a doctor - suggesting increased health needs- predict e-health use as does being alone -and not having someone at home for support.

In Tromsø 7, where data were gathered in 2015-2016, search engines such as Google were the main channel for searching for information about health and illness. In recent

years, video has likely become a much more important source of health information, as social media platforms such as TikTok, Instagram and Facebook now display videos in addition to the more traditional video platforms such as YouTube. Research has shown that the use of videos in social media posts increases engagement [13], and it is suggested that health institutions and authorities utilize videos to disseminate health information [13,14].

Acting on online information was also quite common, showing that this information is of importance beyond enlightening the searcher. Important decisions were made based on the information, including whether or not to see a doctor and whether or not to change medication [1]. This lends weight to the argument that e-health is of importance to the health of the general population.

We might expect major changes in the health services as technology develops rapidly. As those who are young today age, the aging population is likely to become gradually more technologically adept. Rapid changes in AI might transform both traditional health services and e-health services [15], for example, by providing accurate personalized recommendations to individuals seeking health information.

Another interesting finding was that different patient groups have different preferences regarding which type of technology they use to obtain information. While this finding of course may depend on which channels are preferred by those providing information about the illnesses and their treatment, the finding may also reflect the nature of the illnesses. The general high use of all technologies among people with psychological problems might reflect the fact that much information is available on all platforms, but also that people with such problems might use the different platforms in order to connect with other people and attempt to overcome loneliness and isolation, which are central symptoms for many people with psychological problems or mental illness. Similarly, people suffering from cancer (which in fact is a multitude of different disorders with different treatment regimens) might be searching for very specific information pertaining to their type of illness, thereby explaining the higher use of search engines.

Searching for health information can be motivated by a range of different factors and needs [16], and reactions to obtaining this type of information is likely to be varied. In the Tromsø 7 study, most of the respondents stated they had had positive reactions to the information they had obtained online. Having higher education was a predictor of a positive reaction while being ill was a predictor of a negative reaction. Thus, it seems that both these factors can influence how we perceive health information. Being better educated will make it more likely that the person is able to understand and process the information, while being ill is likely to reduce resilience and the ability to process and contain such information [17]. In addition, it is possible that the reactions to online information about health and illness are in part contingent on how people react to information in general, i.e. the personality and level of anxiety of the individual. This would entail that people who are generally more anxious or pessimistic would tend to react more negatively than people who are less anxious and more optimistic.

Finally, we found evidence suggesting that the use of e-health overall does not replace the use of traditional health services, but rather functions as a supplement. Our findings suggest that searching for information about health and illness online -overall- will result in an increase in doctor's visits. While this may be counter to the idea that the use of e-health will help save resources, e-health might in this way contribute to an improvement in the overall health outcomes, as people/patients become better informed and will be able to play a more active and preventive role in their own treatment and care.

5. Conclusions

The Tromsø 7 Study is a major population-based study with central findings about the use of e-health among people aged 40 or older in Norway. The study highlights the importance of e-health in modern health care. Performing similar studies in other countries could represent a next step in research on the use of e-health.

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