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Care seekers perceived trust in telemedicine providers: a systematic literature review

Master's thesis in Global Health
Supervisor: Arild Faxvaag & Anton Hasselgren
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Abstract

Background

Telemedicine is the use of telecommunication technologies, to provide health-related services and - information over a distance. Evaluation and treatment are some areas telemedicine can be used for. This allows the care seeker and healthcare providers (HCP) to communicate without the need of physically meeting. For this communication to be profitable, trust is needed between the two parties. Trust is an important factor in both in face-to-face as in telemedical meetings. It has been shown that patients with increased trust in the HCP report increased satisfaction in care, less symptoms, higher quality of life and more.

Aim, objective and method

Due to the rise of telemedicine use, especially during the Covid-19 pandemic, there is a need for a closer look of the current scientific literature in order to better understand how trust is perceived by patients in telemedical settings. The aim is to review the current knowledge in trust between a care seeker and a caregiver who use telemedical tools to communicate. The study focuses on the interpersonal trust between the two people. A qualitative content analysis was used for this study. 5 online databases were systematically searched using relevant search terms. Strict inclusion and exclusion criteria were established before the searches.

Results

The searches generated 1974 relevant hits. 45 articles were found through snowball method. From these articles, 52 were chosen for further inspection based on title, abstract and/or subject. 19 were chosen from the snowball group. From the 71 articles, 9 were chosen after a thorough read through, for the final analysis based on the inclusion and exclusion criteria. 8 main themes and 1 sub theme were identified.

Conclusion

Trust can play an important role in satisfaction, the outcome and the patient-HCP relationship. A prior face-to-face meeting is beneficial for both parties, as it lays the basis for trust building. Telemedicine can be used as a means to enhance this trust. Continuity and regularity were also found to be important for building and maintaining trust. Telemedicine tools can be both a barrier for establishing trust, as well as a facilitator for it. More time, less hassle around, and the option to choose as well as a caring and focused HCPs are some of the positive facilitators. Studies included had limited age and demographics inclusion. The research done in this area is also limited. Further research is still needed in order to gain comprehensive knowledge of patients trust in HCP in telemedical environments.

Keyword: Telemedicine, trust, Health care provider, environment, patient-health care provider relationship

Acknowledgements

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Abbreviation list

HCP = Health care provider
WHO = World Health Organization
ICT = Information and Communication Technology
RPM = Remote patient monitoring
LMIC = Low- and Middle-income countries

Telemedicine

Telemedicine and Telehealth are terms that are often used synonymously (1, p.1377, 2). Telemedicine can be explained in short as the use of telecommunication technologies, to provide health-related services and clinical information over a distance (1, p.1377 - 5). Distance is a key factor in telemedicine. The World Health Organization (WHO) explains telehealth (telemedicine), as the interaction between a health care provider and a patient using different technologies in different ways. Telemedicine utilises Information and Communication Technologies (ICT) to treat, diagnose, evaluate and communicate between patient and health care provider (HCP), and to educate and research. (6)

In some cases, Telehealth is referred to as a broader aspect of the underlying Telemedicine. Aziz and Abochar (7), differentiate the terms as follow: Telehealth is the support healthcare providers and patients get from the technologies used in different health care services, that are not directly related to clinical practice. These can be for example training, education and meetings within the HCP. Telemedicine is then the delivery of remote services and care with the use of technologies. including the aforementioned remote monitoring and patient care at a distance. (7) In this study the terms will be used synonymously for clarity.

Even though there are seemingly a lot of benefits regarding telemedicine, studies done in the area is still quite limited. It is a new field and still not that commonly used. But the studies done regarding the theme have shown good results regarding health outcomes, similar to traditional methods (6,8). As the Covid-19-pandemic started the need and demand for working telemedical solutions increased (9,10). According to the Centers for Disease Control and Prevention (CDC) the telemedical visits in the U.S increased by 154% compared to the same time a year before. 41-42% of adults reported to have delayed or avoided seeking in-person professional care due to fear of Covid-19. The increased access to telemedicine could be a way for people to access care while at the same time reduce disease exposure. (11)

Although telemedicine can be considered a new and innovative field in health care, it has in fact been around in some form for a long time. Communication over a distance has been vital for the survival of many civilisations. Horns, fires, smoke, and drums were just some ways of communicating over a distance before modern electronic technologies. (12) The first technologies

to be implemented into health care for communication at a distance, that improved the care of patients, was the telegraph in the mid-1800s. Soon after, the telephone furthered and improved the communications at a distance. These improved the care of patients, when physicians and health care providers were able to communicate with patients as well as with other physicians and entities to improve the care and their knowledge. These technologies can be said to be the first major steps towards the telemedicine we know today. (13, p. 6) The first mention of telemedicine in a medical paper can be traced back to 1950. The authors of the article describe the transmission of radiologic images between West Chester and Philadelphia (24 miles apart) by telephone, in 1948. Clinicians at the University of Nebraska used a two-way interactive television in 1959 to send information, such as neurological examinations across campus to medical students. Five years later, using the same technology, they established a link between the university and the Norfolk State Hospital, lying 112 miles apart, providing therapy, diagnosis, consultation, research, training, examination and education. Telemedicine is still used for the same reasons today. Although many telemedicine projects were started after this, often supported by the government and even NASA, only a few of them survived to the 1990s. Interest for telemedicine was low at this point, shown by very few mentions of telemedicine in scientific papers at that time. (12)

By time, cheaper hardware, digital communications and the internet allowed for more intricate services and increased the interest in telemedicine once again. Although there is now a days advanced technologies and digital innovations that would allow for great telemedical service, very few of them have been adopted into the commonplace service. (6)

Different types of telemedicine

Telemedicine can be divided into three main categories which will be presented and discussed in this section.

The first category of telemedicine is called synchronous. This means that a patient and a HCP can communicate remotely in real time. With for example the use of chat or video conferencing and possibly medical peripherals, HCPs and patients can converse and consult with each other over a geographic distance. (1, p. 1378, 3,6) This can also be used between HPCs to consult one and other. A normal phone call is also a part of the synchronous telemedicine. When using video call, audio and visual aid can be used to make an examination of a patient easier. (7) The most typical digital service of synchronous telemedicine uses at least a video camera, an audio system, a display and/or

internet service for the transmission of data between the two parties. A secure, high-speed internet connection is desirable. (14, p. 1) Due to this as well as complex and costly infrastructure and the need for the two communicating sides to be present at the same time, the digital synchronous telemedicine systems are not yet widely used in Low- and Middle-income settings (14, p. 1). But as smartphone and internet use is on the rise and better band infrastructures are built these synchronous services may become more and more common (15,16). Studies done in the area show positive results regarding health outcome, acceptability and attitudes towards using a synchronous system for treatment (8,17-19).

The second commonly used category in which telemedicine can be divided into, is asynchronous, or Store-and-forward. This means patients collect personal health data over a period of time and send it to their HCP remotely. Similar data can be sent between HCPs for e.g. consultation. This can be for example spirometry results, electrocardiogram (ECG), blood pressure results or pictures. This allows patients to collect the data at a convenient time and to send the information to their HCP at a suitable time. (1, p. 1378, 3,14) Devices capable of storing, downloading and transmitting data are used. For example, images from a camera or a digital text could be sent via secure email over the Internet, or a text with text message. (14, p.2) Asynchronous services could be considered easier to set up and require cheaper infrastructure than synchronous services (6). Because the two parties do not need to be present and available at the same time, excess waiting time and appointment scheduling is eliminated. HCPs and specialists can analyse the data at their convenience and send the results easily and quickly to the recipient. They can analyse and examine, and thereafter send the data remotely at a quicker pace and therefore get more data covered in less time. Lab-results, reports and records are some of things that can be sent between two parties, either patient to HCP or vice versa, or HCP to HCP. (14, p. 2, 6) Although asynchronous telemedicine is more commonly used, it has not gotten the same attention as synchronous telemedicine yet. (14, p. 2).

The last category, telemonitoring or remote patient monitoring (RPM), does not fall into the synchronous or asynchronous categories, and is therefore presented here as a separate category. Medical peripheral devices can be used in both of the above-presented categories but are a large part of the third category; telemonitoring (3). Medical peripheral devices are, according to Mosby's Medical Dictionary (20), "any hardware device that may be attached to a computer's central processing unit via a cable, such as a printer, monitor, or external backup drive" and according to IVCi Glossary (21), "Medical devices that operate along with video conferencing technology,

allowing a medical provider to analyse a patient from another location" (20)(21). It is however not as simple as that. RPM utilizes digital technologies, to collect medical information and to send the information to HCPs remotely to be analysed and assessed. This can be either synchronously or asynchronously. Some devices may collect data and send it automatically to the HCP. RPM is mostly used by chronically ill patients and in homes, but new ways of using medical peripheral devices for telemonitoring is being established. (3,22) Capturing heart rate, oxygen levels, weight and blood glucose levels are some ways of using medical peripheral devices in RPM. Implanted blood glucose monitors can notify when blood glucose levels are too low or too high and keep HCPs updated on the patients' condition by sending information directly. (23) Telestetoscopes used by patient or home-aid is a synchronous way for a physician to examine a patient remotely (16). As the population is getting older, and more people want to live at home instead of retirement homes, RPM implementation is growing in importance. Studies show that RPM can reduce patients' visits to hospitals and encourage to better self-care. (22) This may then lead to lesser cost for the health care system, better inclusion of patients and prevention of malady.

Telemedicine in the world

World Health Organization (WHO) describes several benefits with telehealth/telemedicine. Telemedical services can, for example, provide health services to rural areas all around the world (6). According to WHO "Telehealth can contribute to achieving universal health coverage by improving access for patients to quality, cost-effective, health services wherever they may be. It is particularly valuable for those in remote areas, vulnerable groups and ageing populations." (24) Telemedicine is, however, not only suitable in rural and remote areas but in urban areas as well, according to WHO (6).

Mobile phones are becoming a commodity in every part of the world. In 2019 the number of mobile phone users were estimated to surpass 5 billion. It is furthermore estimated that over 67% of the world population will own a mobile phone by 2019, over 50% of them being smartphones (individuals of any age who own at least one mobile phone and use the phone(s) at least once per month). When combined with the internet usage in the world, which was estimated to reach up to 58% globally in 2019, the potential amount of people able to be reached increases even more. (15) Therefore, reaching people even in remote areas is becoming easier and thereby making it simpler to treat and communicate with patients anywhere, through telemedicine (25).

In many areas of health care, telemedicine could be more cost-effective than traditionally used methods, for example telepsychology and teleradiology. In the long run it requires less infrastructure when patients and people do not need to be moved from location to location. It decreases the clinical costs for hospitals and examination equipment. As previously mentioned, telemedicine could help people in remote areas access health care. It would make health care available for people that previously did not have access to it, due to long distances, high costs and/or life situation, and thereby possibly increasing equality. (6)

The attitudes towards integrating telemedical services in more secluded areas have also been shown to be positive (26). The trust in telemedicine solutions tends to be high in Low- and Middle-income countries (LMIC). This trust in telemedical solutions tend to affect the trust in the HCP (17-19). There are however some difficulties in implementing telemedicine services in these areas. Several aspects need to be taken into consideration for successfully implementing telemedicine services in LMICs. The acceptance and expertise of the local people must be taken into consideration. Software and component expertise and the possibility to address technical problems is needed for the longevity of telemedical solutions. A structured framework, all the way from government to system security is needed. Despite all this, if implemented correctly, telemedical solutions can have a great impact on many aspects of health care and enable countries to move rapidly to a safe, secure and successful health care delivery. (27)

Of the WHOs member states, around 55% reported having a specific national telehealth policy or reference to telehealth within their national eHealth policy. According to WHO, approximately 75% of countries reported having a teleradiology programme in place. Around 50% reported having a remote patient monitoring programme and a teledermatology programme and roughly one third of responding countries reported a telepsychiatry programme. Most of these programmes were reported to be managed at a national level or lower. This means that fairly few programmes were operated internationally. The most common evaluation criteria for telemedicine were; programme acceptance for both service provider and patient, quality, access and cost effectiveness. The reported barriers for implementing such programmes were; lack of funding to develop and support programmes, the lack of infrastructure (e.g. equipment and/or connectivity), other, more urgent health system priorities and insufficient legislation or regulations addressing telehealth programmes. (24)

From these member states, Finland has been a frontrunner in the use of eHealth solutions and digital services within health care for a long time (28). Finland's Ministry of Social Affairs and Health has since the mid-90s assessed the status and trends of e-services on national level (29) which means that services are monitored closely (30).

The Finnish National Supervisory Authority for Welfare and Health, Valvira, has guidelines for entities providing telemedicine in Finland. These contain both guidelines the providers as well as for required systems to use. The provider of telemedicine services must have the suitable premises, equipment and qualified staff for the provided services. Patient safety and identification are important factors. For this, the systems used for transmitting, storing and identifying must meet the legal requirements for confidentiality and data protection and security. Identification must occur through a safe and reliable method. One such method is "strong electronic identification", as set out in the Act on Strong Electronic Identification and Electronic Signatures (617/2009). Verification of the method retrospectively must be possible. Furthermore, it is the providers responsibility to assure that appropriate systems that guarantee security and data protection are in place for the service offered. (30)

An assessment of suitability of delivered telemedicine services is needed. Both to see if a service is appropriate to supply through telemedicine systems, as well as if a patient is suitable for the provided service. All the HCPs and independent practitioners in the private sector, who provide telemedicine services must be licensed or registered to provide healthcare services as set out in the Act on Private Health Care (152/1990). These professionals are authorized to provide the telemedicine services under their existing license. Appropriate licenses are required for the purpose of providing telemedicine services. (30)

Trust

According to the Cambridge Dictionary, trust is "to believe that someone is good and honest and will not harm you, or that something is safe and reliable" (31).

Luhmann N. says, in the book Trust Matters In Health Care by Calnan M. (32), that trust is needed, as it increases tolerance of uncertainty. He states that trust "reduces social complexity by going beyond available information and generalizing expectations of behaviour in that it replaces missing

information with an internally guaranteed security". This means that trust enables people to take risks or to avoid risks. (32, p. 6)

Trust can also vary in quality and quantity. For example, people may trust their nurse to measure their vitals but mistrust them to handle their medication or with health-related problems but not family related problems (33).

According to Mcknight & Chervany (34), trust is hard to define narrowly. They argue that trust refers to a broad set of constructs (34, p. 5). The definition of trust tends to reflect the academic discipline of the researchers. This means that a sociologist sees and tends to explain trust in a different way than for example a healthcare professional will (34, p. 11).

Mcknight & Chervany (34) argue that there are three major categories of trust; Impersonal/Structural trust, Dispositional and Personal/Interpersonal trust. Dispositional trust is based on the trusting parties' personal attributes, meaning that a person already has a tendency to trust. Erik H. Erikson (34) means, that dispositional trust is "a sense of basic trust, which is a pervasive attitude toward oneself and the world," an "essential trustfulness of others as well as a fundamental sense of one's own trustworthiness". Personal trust is, according to Mcknight & Chervany (34), that a person trusts one or several specific persons or things in a given situation. The Interpersonal trust on the other hand, means that two or more people or groups trust one another in a given situation. (34, p. 8-10)

Mcknight & Chervany (34) also mean that trust varies in different situations. A patient does not usually care if her physician is motivated to do her job due to money or the desire to help people, or some other reason. The patient just wants the physician to have the competence to treat and give proper treatment for her problems. But if a situation arises between the patient and physician, where the physician must make greater decisions on the choice of care, a decision that might take a toll on the patient, the desire to help and interpersonal trust in this relationship might play a bigger role. (34, p. 10)

Pearson and Raeke (35) on the other hand, mean that there are only two types of trust that one must take into consideration when talking about patient-physician relationship; interpersonal and social trust. The interpersonal trust refers to the trust that is built up over time, where this trust can be

examined/proven through repeated interactions between two people. (35) Unlike Mcknight & Chervany (34), Pearson and Raeke (35) argue that social trust is, as the name implies, the collective and community-based trust, mainly influenced by the media, social media, and other social foundations. It is usually directed at the hospital or healthcare organizations. The social trust is usually the foundation on which the interpersonal trust is built upon in a patient-physician relationship.(34,35) Different informal social mechanisms such as gossip and rumours have been shown to contribute to the creation of trust or mistrust over the rational self-interest (32, p. 5, 34, p. 44).

In this study, Pearson and Raekes (35) definitions will be used for better clearance.

Interpersonal trust and why it matters

By the rise and increase of information and technologies, typical face-to-face interactions have shifted the social interaction and communication to more technology-based forms. The risk of misunderstandings and thereby non-cooperation has risen by the indirect communication enabled by technologies. Therefore, trust could be an increasingly important factor in cooperation and relationship building. (36, p. 16)

According to Miller-Keane Encyclopedia and Dictionary of Medicine (37), "trust" is "a concept involving both confidence and reliance; to trust someone is to become vulnerable and dependent on the other person's intentions and motivations. Important trust relationships in health care are between patients, family members, the public, and providers."(37) They mean that "Health professionals have three obligations for being trustworthy: 1. Acting consistently for the good of the patient, 2. having high levels of judgment and skill competence, and 3. fulfilling special roles such as the fiduciary one." (37) They continue by saying that "In health care, it is essential that patients be able to trust in the discretion of health care workers. It is impossible to specify moral practice in terms of rules or rights alone. It is difficult to separate knowledge and skill competence from moral competence (concern for the patient's well-being) in the professional's behaviour. Trust must be earned and merited by performance and fidelity to its implications." (37)

The need for trust seems to be essential in an environment or situation, where there is uncertainty or some level of risk. This trust is needed if the risk is based on a person's dubiety regarding the

intentions, motives, and future actions of another individual whom the person is reliant on. (32, p. 2) Therefore, trust appears to be especially important in health care settings. (32, p. 3).

The need for interpersonal trust in health care is related to the vulnerability often associated with being ill as well as the uneven and unequal relationships between patient and HCP and the social position of the medical profession. It appears to be the scientific medicines' expertise, or claims to expertise, that is the basic condition for creating trust in this context. The emotional factor may play a part as well. (32, p. 2-3) This expertise or claim to expertise is much harder to prove in a telemedical environment and might play a part in building trust. Trust plays an important role in health care regardless of the system that provides it (32, p. 3). Having proper certificates is however only one aspect of the trust building process. Patients tend to look at other cues during the encounters to confirm their expectations. (38)

In general healthcare, the factors that play the biggest role in trust building is the confidence in competence, and whether the professional is working in the best interest of the patient (39). Working in the best interest of the patient tends to comprise of confidentiality, caring and honesty as well as showing respect. The confidence of competence comprises both technical and social skills, which importance may vary depending on the setting and organization where the care is provided. Patients may also more easily trust a health care personnel due to patients vulnerability related to their illness. Their vulnerability may lead to stronger trust, both emotional and spontaneous. The patient may therefore have positive expectations on the competence of the HCP and that they will work in their best interest. (32, p. 7, 39) The conception of expectation is, according to Davies P, in the book Trust Matters In Health Care by Calnan M. (32), a part of all definitions of trust. The patient and the public have an expectation that the HCPs will show knowledge, skill and competence in health care, that professionals will behave and act accordingly in the best interest of the patient and in goodwill, fairness and honesty. These expectations contribute to the basis of trust. (32, p. 7)

However, loss of trust within health care can have long lasting effects. Losing trust, whether it be in interpersonal trust or institutional trust (=a general attitude based on once personal experiences combined with existing social norms), can affect the perceived trust to the healthcare system as a whole. Gaining back trust and building up once lost trust can prove to be difficult as patients may generalize and project negative attitudes on all HCPs due to prior loss of trust. (40,41) Loosing trust

tends to result from patients concerns for HCPs competence as well as HCPs attitude and limited knowledge of a situation (41).

The context of trust, specifically interpersonal and institutional trust, is changing. A study done in the United Kingdom showed that under 40% of people have trust and confidence in managers of health care organizations, whereas the number for trust in doctors and nurses was over 80%. People have traditionally trusted their doctors at a high level. But the idea that the "doctor knows best" is becoming less and less relevant. Nowadays the patient is considered "always right" and is kept close to the decision making. Regardless of the rise of easily accessible information, trust in doctors and health personnel is still relatively high and considered important. A high level of trust has many positive outcomes for both the patient as well as the provider. It furthers the use of different services and motivates the patient to share important medical information with health personnel and organisation. It leads to higher patient satisfaction and continued visits to the provider. (32, p. 4)

According to a study done by the Finnish Medical Association in 2019, 70 % of Finnish people trust the Finnish health care system fully or almost fully. Only 7% trust it barely or not at all. The rest trust the system somewhat or they could not say. Nearly 90% of people who answered the survey generally trust doctors and think that doctors are professional and do their best for the best possible care of a patient. (42)

Entwistle and Quick (32) argue in the book Trust Matters In Health Care by Calnan M. (32), when writing about trust in the context of patient safety that: "...we should also accept that the placing of trust by a patient in a healthcare provider does not necessarily depend on the patient being ignorant of healthcare safety problems, being convinced that their healthcare providers have exceptional safety records (or prospects) or being totally convinced that no harm will befall them." (32, p. 8)

Trust between a patient and HCP is vital for a variety of reasons. It is shown that trust has an impact on the therapeutic processes and indirectly influences health outcomes by impacting patient satisfaction, engagement, commitment in the provider. and the acceptance to and of treatment. Acceptance of vaccines and other treatment has also been shown to increase with trust. Additionally, it encourages patients to seek treatment and to give needed information so that a precise and timely diagnosis can be made. (32, p. 9) People tend to share more personal information about themselves to another party when the other party is perceived as trustworthy or when the

personal information can be seen as beneficial for the sharing person. By sharing personal information, the person may realise that it reduces uncertainty and in the mutual acquisition of information. (43, p. 324)

Trust may also be a somewhat better indicator of health care performance and overall assessment of the quality of the given care than patient satisfaction. Trust is a more ongoing and forward-looking process than patient satisfaction. It reflects the patient-HCP relationship and examines the attitudes. Patient satisfaction evaluates more the past experiences of a patient and assesses the performance of the HCP. Therefore, patients perceived trust could also be used as a potential measure of the quality of healthcare. (32, p. 9) Patients high trust in HCPs has also been linked with higher reported quality of life, more satisfaction with given treatment, less symptoms and more beneficial health behaviours (44).

Interpersonal trust forms in the initial phase of a relationship. This refers to the phase where and when the different people or parties are unfamiliar, meaning they do not have any or very little verified information about each other. This is usually due to the parties' unfamiliarity of each other. This uncertainty can also be a combination of both the unfamiliarity and the new relationship, as well as relationships distance. Because when people are socially distant, in a telemedical environment for example, it might take some time to get first-hand and verifiable information about the other party. The initial phase ends when the parties experience first-hand interaction or transaction and so gain verified information. (34, p. 29)

In the initial phase parties feel around for the right level of trust due to uncertainty and doubt. Many important decisions, such as sales, temporary tasks, meetings and diagnoses are made in the initial phase. The level of trust in the initial phase can determine, whether the parties can cooperate, their effectiveness and their willingness to work together or accomplish their common goal. The level of the initial trust in other words makes it easier or harder to both work together and to impact the relationship in a positive way, and it is the key to what the parties can accomplish. The initial phase is also the base for a lasting future relationship, because it is here that beliefs and opinions are formed. (34, p. 29)

How is trust measured?

As mentioned earlier, trust plays an important role in many aspects of health, not only in telemedicine but in general in the interpersonal relationship between two people. But in order to find scientific conclusions and outcomes of trust, a way to assess trust must be found.

There are discussions about whether trust can be seen as a measurable object. It is argued that trust is such a subjective and complex thing, with many factors playing a role in it, that it is difficult to use simple metrics to measure trust (45). Others have argued that trust is a "coherent psychological construct" and because it is possible to differentiate between satisfaction, which is regarded as the most similar construct to trust, it can be reliably assessed (46). However it may be, trust needs to be assessed somehow in order to get adequate data in research. Therefore, many different tools have been developed for trust assessment (46-48). All tools differ slightly from one another. Some look at predictors, pre-existing or consequences of trust, but most are still coherent with the theoretical concept of patient trust (46). The tool most commonly used for trust assessment is a scale. Some of the available scales and tools are better than others. Some scales do not properly distinguish trust from similar concepts and cannot therefore distinguish the important domains of trust. (49)

Empirical testing and development of scales for trust in familiar physician is much more advanced than assessing trust in medical institutions systems or the medical profession in general (49). Rolfe et al. (46) studied interventions for improving patients' trust in doctors and groups of doctors. Of the studies included in their research, the majority had used the "Trust in Physician Scale" by Anderson & Dedrick. (46) It is a 11-item self-report scale developed to assess an individual's interpersonal trust in his/her physician (50). It is a variation of the Likert scale, developed by Rensis Likert in 1932, that asks specific questions and lets the participant choose from a scale that typically goes from "strongly agree" to "strongly disagree" with various steps in-between (51). This type of scale seems to be the most commonly used method for assessing trust.

Trust and interest in Telemedicine

In a virtual environment, trust must be established between all parties in order to maintain a reliable, secure and legitimate platform. Several steps are needed in order to reach and maintain a sufficient level of trust in this kind of surroundings. User policies, conditions, terms, rights and limitations are important foundations for any kind of telemedical service. A good security level for all medical data, authentication and user certification, for both parties (caregiver and –seeker), and

identification mechanisms that will preserve anonymity while guaranteeing truthfulness are equally important. (7)

The trust in Telemedicine is constantly on the rise but is still not at the same level as trust in an in-person appointment. In a 2015 study conducted by Technology Advice among U.S. adults, 64.6 % of respondents said they would be "somewhat or very unlikely" to choose a video appointment. Only 1.1% stated that they would trust a virtual diagnosis more than a diagnosis gotten from an in-person appointment. Nearly 30 % declared they would not trust a diagnosis from a virtual setting at all and 45 % said they would trust this kind of diagnosis less. If they would have met the provider in-person before a telemedicine appointment, 65 % would be "somewhat or much more likely" to use a virtual appointment system. (52) Over half of patients would be willing to use telemedicine, if they would meet with their own provider (HCP). 34.9 % were willing to see a different provider but at their own healthcare organization, while 36.7% of the respondents were unwilling of this. Only 18.6 % were willing to see a different provider than their own at a different health care organization using telemedicine. It seems like the more "unknown" the provider is to the patient, the more unwilling the patient is to meet or trust the provider at the same rate in telemedicine as in an in-person appointment. (53)

In a survey made by Deloitte in 2016, American consumers reported most interest in using telemedicine for post-surgical care and for monitoring chronic conditions. Consumers were less interested in using telemedicine while traveling and for minor injuries. The group with the most interest in using telemedical services over all were the Millennials (54) (born around 1981 to about 1994 (55, p. 315)). Millennials were also less likely to limit telemedicine use to a regular, trusted provider (only 27%) while 60 % of the seniors (born 1900-1945) would use telemedicine only with their regular HCP. They were also the group with less interest in using telemedicine overall. The survey also asked what factors and fears that influenced their choice to use telemedicine. Around 33% did not report any specific concerns. Others reported that they worried about the quality of care and data security. 15% reported difficulty of using the technology as their biggest concern. (54) However, another study found the lack of trust towards telemedicine to be the biggest concern but the fear of privacy not of big significance. The same study found that communication with HCP was the most appreciated feature of telemedicine. (56, p. 4)

The Employee Benefit Research Institute found similar results as Deloitte. The survey focused on three generations; Millennials, Generation X (born 1966-1976) and Baby Boomers (born 1946-1965). They found that 40% of Millennials thought telemedicine was an extremely or very important option whereas only 19% of the Baby Boomers thought so. (57)

Face-to-face and telemedicine differences

People are increasingly looking for information online. Health care related information is no exception. When more and more health care services are provided online, the possibility to choose a practitioner increases. This has led to an increase in websites providing people with information about medical services and practitioners. The seeker can look up information about a service or practitioner and based on their information and rating they can decide whether to go with the chosen one or look for another. The websites information is based on patient experience and satisfaction of the encounter with their practitioner. On the website patients could give ratings and virtual presents to physicians and practitioners that they considered good. However, they tended to choose their practitioner based on the practitioner's activity on the website. If a physician was active and updated their profile and shared articles for others to read, their activity levels rose which led to an increase in patients choosing that specific practitioner. This does not contribute to the real trust factor of a practitioner and can in some cases mislead a patient due to more online activity of a physician. (58)

There has been some research suggesting that people using e-mail or chats tend to be more aggressive and hostile than at face-to-face meetings. This may be because the parties feel more distant from one and other and are therefore less careful and polite. This can lead to loss of proper communication. (59) Because of the absence on nonverbal cues, questions and answers can be perceived more honest and straightforward. Therefore, expressing sincerity is very important in text-based online communication. (43, p. 324)

Some studies show that it may take a longer time to build up trust in an online environment than in a face-to-face setting, and that parties using telemedicine rate each other's attributes on a lower level on a short time period. However, the trust levels and ratings have risen to the same level after some time and some studies suggest that online or electronic means might be even more personal and productive than face-to-face meetings. (43, p. 325, 59)

According to Altman and Taylor (60) a person will reveal more personal and in-depth information to the counterparty, the more the relationship develops (60). In the first conversations, face-to-face settings usually do not provide a setting that would allow truly deep revelations. It is shown that in a face-to-face conversation, the first minute on a minimum usually goes to non-intimate demographic information sharing. (43, p. 325) A text based telemedical service may not provide the same proficient ways to minimise uncertainty as a verbal face-to-face conversation. But more in-depth questions may offer a way of changing up otherwise less personal interactions. Due to the fact that text-based telemedicine services are non-verbal, they can also have a shielding effect that may help a person feel more comfortable and less self-conscious, sharing personal information to the other party. This shielding or sheltering effect is not present in a face-to-face conversation. (43, p. 325, 61) This may also be the case in audio-visual appointments or consultations due to decrease of visual and contextual cues (62).

It is still not very clear how face-to-face appointments between a patient and a physician differs from a telemedical appointments in terms of developing the interpersonal relationship, the exchange of information and the joint decision-making (62). A project that is ending in 2020 is however examining the trust between patients with different sociodemographic backgrounds and the telemedical delivery of mental health services. Their goal is to study how telemedicine, and which of its features, may impact the trust building between patient and their providers in mental health services. (63)

The social contacts with people or parties that one meets can build up and strengthen trust. In a virtual environment the distance may prohibit these kinds of interactions. The question is, can remote contacts compensate for the lack of face-to-face interaction? (32, p. 44).

Rationale

Rationale for the study

The use of telemedicine is on the rise. Even though there are studies showing the difference in care results in a digital environment compared to the more "traditional" environments, there is little research exploring the perceived trust in these environments. Some studies showcase the different views of trust to the actual format of telemedicine, but this does not cover the trust in care, information or HCP. Therefore, there is a need for an understanding of the interpersonal trust in

these environments. This could help in understanding the possible difference in the perceived trust and whether something could be done to change and improve the care for patients using telemedical tools.

The rapid growth in telemedicine during recent years can be partly explained by the continuous need for faster and more functional ways to solve problems in health care all around the world (1, p.35). Better broadband infrastructures and accessibility as well as cheaper technologies and rising clinical acceptance has helped boost this rapid growth (64,65). The interest in telemedicine is increasing both at home but also in healthcare settings as a tool to facilitate care and to access care (64). The Covid-19 pandemic during 2020 has only boosted the interest and the need for working telemedical solutions (9-10). One of the big issues today is to make telemedicine as, - or even more - trustworthy than an in-person appointment. For this secure identification, safe data storing, and more transparent systems are needed

There is a need for a comprehensive review and summary of the current scientific literature to create a better understanding of how trust is proceeded in a telemedical setting. Much research in this area is focused on the trust on the technology and the usage of the technology rather than on the perceived trust on providers (52-54). Therefore, there is a big knowledge gap and a need for a deeper understanding of the perceived trust in telemedical environments.

Aim

The aim of this research is to systematically review the current peer-reviewed literature on trust between a care seeker and a caregiver who use telemedicine tools to communicate. The review will focus on the interpersonal trust.

Research questions

1. What is the current knowledge of care seekers' perceived trust in a caregiver, in a telemedicine setting?
2. What is the perceived trust/mistrust based on?
3. Is there a difference on the level and form of trust compared to an in-person appointment?

Method

Systematic reviews are an effective way of deepening the knowledge of themes and research areas that has already been studied. In the last ten years, the "evidence based" idea has gained more support especially in health research, meaning that the given care should be based on a comparison of conducted studies. (66) According to Denyer & Tranfield (67) "A systematic literature review should not be regarded as a literature review in the traditional sense, but as a self-contained research project in itself that explores a clearly specified question, usually derived from a policy or practice problem, using existing studies." (67)

Content analysis method was used as an aid to identify and thematise the gathered data. The content analysis is based on the book *Laadullinen tutkimus ja sisällönanalyysi: Uudistettu laitos* (66) by Sarajärvi and Tuomi. Content analysis looks for the meaning of the text and is a tool to organise the text for analysis. (66)

The PRISMA checklist was used as a framework for this study. The PRISMA checklists aim is to work as a basis for reporting of systematic reviews and is a tool to help authors improve reporting of their studies (68).

Inclusion and exclusion

Below inclusion and exclusion criteria are listed

Types of studies

This review considered all studies that contain, discuss or cover the topic interpersonal trust within telemedicine. All forms of telemedicine were considered for this study. Studies that were included, either looked at trust between two or more parties, how this trust is built and/or what affects the trust in telemedical settings. Since trust is not a fundamentally changing phenomenon, no time period limit was set.

Types of participants

The study explored a wide range of participants and fields where telemedicine is used. Therefor research conducted on participants of all ages and sex were included. However, the study focuses on the patient-HCP relationship and did therefore exclude studies concerning patients' relatives or second-hand participants.

Types of outcome measure

The primary outcome of interest was to review the current knowledge of interpersonal trust within a health related telemedical appointment or surrounding. The secondary outcome measure was to see how people express their trust/mistrust. The third outcome measure was to see if there is any reported difference in trust in a telemedical surrounding compared to an in-person surrounding and the possible causes for this.

Database search

The search terms included were: "trust", "telemedicine", "physician", "provider", "remote", "face-to-face" and "in-person". A combination or variation of these terms were used in all the databases and MeSh-terms used when applicable. If a search yielded to many hits, a specification of the search was done by adding or removing a search term. No time period limit was added. Only articles that discussed trust in some form were included. The NTNU University Library's guidelines for systematic literature reviews was used as guidelines for the search strategy (69).

Systematic searches for articles and studies was done in the following electronic databases:

- PubMed
- Cinahl
- Elsevier
- Cochrane Library
- SAGE

Article assessment

Articles were considered and chosen for further review based on the title, abstract or subject description. The articles chosen for further assessment were read through and analysed closer. If an article met the criteria it was chosen for the final analysis. Only articles that were fully accessed were considered for this study. If there was uncertainty whether a study should be included the supervisors of this study was consulted.

The Snowball method was also used to find studies. This is a search method where known article references or citations can be used to find further articles and papers. It can also be used to find other articles that have cited the known paper to find additional papers. (70)

Theme identification

A content analysis was performed. It acted as a tool to structure the found data. When the searches generated enough studies, the papers were grouped in order to more easily analyse and identify different themes regarding the research questions. These groups and themes were formed based on the gathered information and articles analysed. The maximal number for themes was set to10 to keep the study focused and contained. The themes are not the final results of the study, but a means to comprise and study the data (66).

The data search and gathering process was recorded and presented in a Flow Chart based on the PRISMA flow diagram (68).

Results

Data search

For this review five electronic databases were searched; PubMed, Cinahl, Elsevier, Cochrane Library, SAGEJournals. The searches were performed between June 2020 and November 2020. Only articles in English were included in the final report.

The initial searches identified 1974 articles and 45 articles were found through the Snowball method. Based on the title and abstract 52 articles were chosen from the search, based on the inclusive and exclusive criterias. Further 19 articles were chosen through the snowball method. This led to a total of 71 articles that were read in full. Out of these articles, based on the research question and inclusion criteria, 9 articles were chosen for inclusion in this study. They are presented in more detail in Table 1. A Flow chart of the data search and inclusion and exclusion of studies can be seen in Figure 1.

Study characteristics

A common factor in most of the studies included in this review was higher age. Only three studies reported participants younger than 30 years of age and no study reported the mean age lower than 47. The average age for the majority of the studies was between 55 and 70 years.

Most of the studies included in this review had conducted interviews or surveys or were mixed-method studies looking both for qualitative outcomes as well as quantitative outcomes. For this study the qualitative outcomes were of greater interest due to more in-depth findings reported in the chosen studies. All but one of the included papers had trust as a secondary finding in their study.

The sample sizes in the included studies ranged from 6 to 199, with an average of around 20. Most of the studies had approximately the same number of male and female participants, with a slightly higher percentage of males. No study reported differences in trust in HCP based on gender. No other socio-demographic factors regarding trust in HCPs were reported either. None of the included studies have looked at the trust towards the HCP in telemedicine based on demographics.
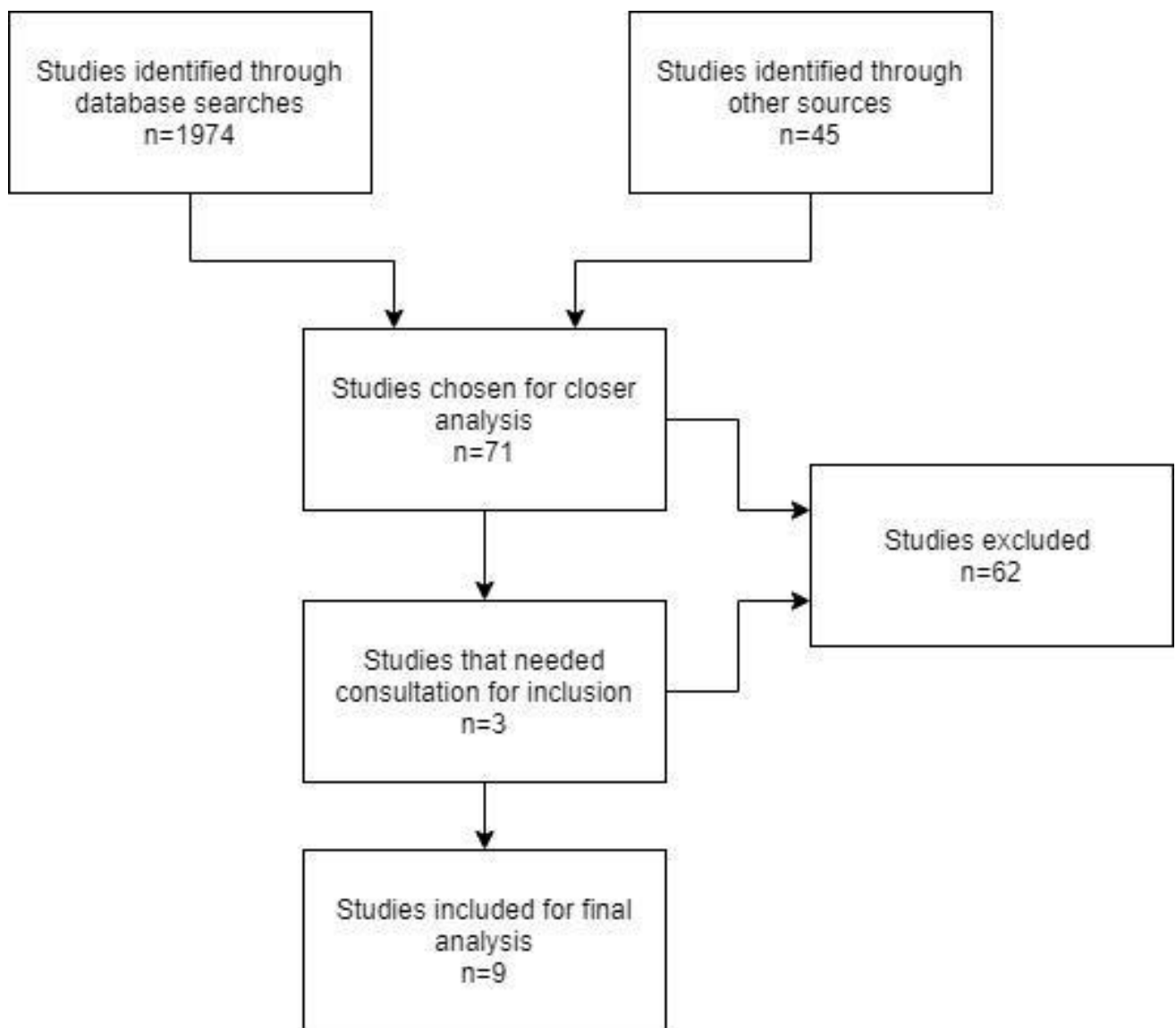

Figure 1. Flow chart of data search, inclusion and exclusion of studies.

Themes identified

After reading the articles, 8 main themes emerged based on their reported results. One sub-theme was further identified. The results will be presented in the themes in no specific order below. The themes identified based on the findings and common factors of the studies were: Difficulties building trust in telemedicine environment, Trust linked with satisfaction, Trust in facilitator favours the use of telemedicine, , Trust is key for successful outcome, Surroundings effect on trust, Face-to-face compared to telemedicine, (sub-theme): Prior in-person meeting affect on trust building in telemedicine environment, Encounters impact for trust building, More information regarding HCPs.

All people promoting health and that is the target of the patient trust is either referred here with their profession, title or as "HCP". All of the studies measured trust through interviews or questionnaires using a variation of a Likert scale (51).

Author(s) and Year	Aim	Sample and country	Method	Telemedicine used	HCP
Sabesan S, Kelly J, Evans R, Larkins S. (71) (2014)	Explore patients experiences of using telehealth at a oncolocy-clinic.	35 patients from Townsville, North Queensland, Australia were interviewed (31 patients were included in the final rapport)	Exploratory, descriptive, qualitative study. Individual interviews.	Videoconsultation	Oncology specialist
Farver-Vestergaard I, O'Connor M, Smith NC, Løkke A, Bendstrup E, Zachariae R. (72) (2019)	Evaluate the clinical feasibility of home-based, tele-delivered mindfulness-based cognitive therapy in chronic obstructive pulmonary disease.	Eight patients from Denmark with chronic obstructive pulmonary disease (mean age: 72.6 years; 50% female)	Mixed-method study. The patients received a standardised eight-week mindfulness-based cognitive therapy programme delivered via home-based video-conferences in groups of four. Individual qualitative research	Videoconference	Clinical psychologist

			interviews were held after the eight-week therapy periode.		
Levy S, Bradley DA, Morison MJ, Swanston MT, Harvey S. (73) (2002)	Explore the attitudes and responses of older people to telecare and home-based technologies.	7 subjects with no prior knowledge or experience of telemedicine and 5 with experience. Questionnaires were sent to 199 people in three client groups in Scotland (day hospital patients, residents of local authority sheltered housing schemes and residents of a private housing association) with a 42% response rate. All participants in this study were over 60 years.	Data was collected by engaging subjects in a semistructured interview in their own homes. Preliminary analysis of the qualitative study was used in the construction of a questionnaire, which was distributed to three client groups. The returned questionnaires were then analysed to provide a record of the level of agreement with the 17 statements in the questionnaire, together with demographic data.	Videoconsultations	General practitioner.
Kazawa K, Osaki K, Rahman MM, Moriyama M. (74) (2020)	Examine whether telecommunication-device-based distance interviews are inferior to face-to-face interviews in terms of facilitating behavioural changes and disease management in	40 participants from Japan (mean age 58 years) were included in the intervention. 32 of these participants were interviewed.	A post-hoc analysis of data from a randomized controlled trial, in which the research team compared the efficacy of remote self-management education with that of direct education for patients with diabetic	Video and telephone	Nurse

			nephropathy. Participants were randomly divided into two groups. Over 6 months, the intervention group (n = 21) received three distance interviews using a tablet computer. Meanwhile, the control group (n = 19) received three face-to-face interviews. In addition, both groups received biweekly nine telephone calls. A triangulation approach was used. The intervention period was October 2014 to May 2015, and the follow-up period was April 2015 to December 2015. A Likert-scale questionnaire and semi-structured interviews were held after the intervention on 32 participants.		
patients with diabetic nephropathy					
Jiwa M, Millett S, Meng X, Hewitt VM. (75) (2012)	Estimate the odds of an individual on-screen being rated trustworthy when viewed in a static image holding or wearing specific	168 people attending community pharmacies to collect prescriptions in Western Australia. (mean age 47)	Respondents were presented with a series of 10 photographs, generated at random, of a man with varying numbers and	Image	Health care personnel

			combinations of medical equipment: stethoscope, reflex hammer, surgical scrubs, otoscope, and pen. They were then invited in a survey to rate the man as honest, trustworthy, honorable, moral, ethical, or genuine, or a combination of these, on the Source Credibility Scale		
items of medical equipment.					
Brandt CJ, Clemensen J, Nielsen JB, Søndergaard J. (76) (2018)	In a prospective pilot study, an online collaborative e-health tool in general practice was tested. The aim of the study was to identify drivers of importance for long-term personal lifestyle changes from a patient perspective when using a collaborative e-health tool, including the support of peers and healthcare professionals.	10 overweight patients (mean age 52 years) from the Region of Southern Denmark.	Patients who had previously successfully used a hybrid online collaborative e-health tool with both face-to-face and online consultations to lose weight in General practice clinics in the Region of Southern Denmark took part in qualitative, semistructured, individual interviews.	An online e-health tool	Dietician
Williamson S, Chalmers K, Beaver K. (77)	The primary aim was to explore patient experiences of Telephone	26 colorectal cancer patients who had received TFU in the UK.	Qualitative interviews were conducted with the patients.	Telephone	Nurse

(2015)	follow-up (TFU) after treatment for colorectal cancer.	A typical participant was retired and over the age of 65 years.			
Warner MM, Tong A, Campbell KL, Kelly JT. (78) (2019)	The study aimed to describe the acceptability and experiences of a telehealth coaching intervention that utilized telephone calls and tailored text messages to improve diet quality in patients with stage 3 to 4 Chronic Kidney Disease (CKD).	Adults with stage 3 to 4 CKD (n=21) aged 28 to 78 (mean 62) years in Queensland, Australia	Participants who had completed a 12-week telehealth-delivered dietary intervention in Queensland, Australia, were interviewed from March to July 2017.	Telephone and text message reminders	Registered dietitian
Andreassen HK, Trondsen M, Kummervold PE, Gammon D, Hjortdahl P. (79) (2006)	Patients' perspectives on e-mediated communication with their doctor, on patients who have used electronic communication tools actively to interact with their doctors.	200 patients in Norway were divided in an intervention and a control group. 12 active users included in the interviews.	An e-tool called PasientLink was implemented in a medical practice consisting of six GPs during a 12-month period. The researchers recruited 200 patients and randomly divided them into an intervention and a control group. Data was then gathered through interviews with 12 of the most active patients.	Internet-based communication tool (PasientLink) developed for use by general practitioners (GPs) and their patients.	GP

Table 1. Table representing the studies included in the final review.

Difficulties building trust in telemedicine environment

Brandt et al. (76) found that establishing a trustworthy relationship with a HCP can be difficult in a fully online telemedical tool (76). A participant in Andreassen et al. (79) study felt that the communication was harder in a telemedical environment. The participants GP had mixed her with another patient while communicating with her in the system which led her to mistrust the GP. Andreassen et al. (79) mean that communicating electronically can affect the trust aspect of the relationship. (79) Several participants in Farver-Vestergaard el al. (72) study mentioned the negative effect of telemedical format on the relationship between the instructor and other participants, often due to technical problems. They meant that this led to difficulties creating trustworthiness and safety and decreased their willingness to share personal things. However, most of the participants felt that they could, over time, build a personal, respectful and caring relationship over the telemedicine platform. (72) In the telemedicine group in Kazawa etl al. (74) study, participants were over all confident in the method and were able to build trusting relationships with their nurses, but reported that technical problems hindered or made it harder to do compared to the face-to-face control group (74).

Trust is key for successful outcome

Brandt et al. (76) found that the greatest factor for a long-term successful lifestyle change regarding weight loss was a trustworthy relationship with a health care professional doing lifestyle coaching. Participants found that it was most important to have a trustworthy person (HCP) to monitor health progress and to put up realistic goals. The four persons who did not find trust or support from their dietician or GP, were also the least successful in the weight loss pilot study. (76) Williamson et al. (77) found that participants had confidence in their HCP contacts ability to give the right kind of recommendations and that the HCP could better help them with their specific problems (77). Warner (78) also found that trust played a vital role in successful dietary outcomes. Some participants expressed that the fact that they saw progress increased their trust in the coach and the telehealth program. (78) Levy et al. (73) had similar findings. They showed that trust was of great importance among participants using a telemedical system for the success of a teleconsultation. Participants felt that trust was built between all parties involved (doctor, nurse, patient and technology). (73)

Trust linked with satisfaction

In Brandt et al. (76) some of the participants felt that the lack of trust in their dietician and the lack of trust in the eHealth-tool was the largest reason for them to discontinue the program or seek other type of guidance (76). Sabesan et al. (71) had similar findings. Those participants who did not trust their local health care system, were less satisfied with the model than others even though they received the same treatment as other tele- and in-person patients. (71) Participants in Williamson et al. (77) study reported a trusting relationship with their HCP, and the fact that they did not see their contact did not change their satisfaction in their care (77). The fact that some participants started to see progress and that the program was working made them want to continue it. This satisfaction was linked with their confidence in their dietician. (78) In Kazawa et al. (74) study participants in a face-to-face control group reported higher confidence in the method and overall satisfaction than participants in the telemedicine group. The satisfaction in the telemedicine group was lower due to problems regarding the telemedicine technology. (74)

Trust in facilitator favours the use of telemedicine

The Warner et al. (78) study found that a close and trusting patient-coach relationship led to good dietary results. This was one of the main reasons some participants wanted to continue with the telehealth program. (78) Some participants in Williamson et al. (77) study, found the facts that the HCP could tell more about participants health, that they had more time and that they focused only on the participant, was reason for why they preferred the telephone appointments (77). In Andreassen et al. (79) study participants wanted a trusting relationship with their GP in order to be able to trust to use the telemedical system. One participant exclaimed that he was very dependent on knowing and trusting the HCP he was communicating with for him to want to use the system. The study also found that personal trust seems to be vital for the patient to feel comfortable in using telemedical communications in general. (79) Participants who had prior trust and confidence with the skills and abilities of the local health service were more likely to approve teleconsultations, Sabesan et al. (71) found. Three of the participants did not trust their local health care services (who assisted them with the teleconsultations) and would therefore rather travel long distances to meet their doctor. (71)

Surroundings effect on trust

Williamson et al. (77) found that the surrounding played a vital role in the trust building and how freely the patients could talk about their issues to their HCP contact. They stated that the fact that

they could themselves choose the location increased their ease to talk and thereby furthered the trust building. (77) Warner et al. (78) found similar results in their study. Participants were happy to be able to choose the location of the phone call. Some expressed that they felt less nervous and less rushed than talking to a HCP at a clinic, when they knew no one was listening and no one was waiting in the waiting room. (78) Andreassen et al. (79), Farver-Vestergaard el al. (72) and Kazawa et al. (74) further strengthened these findings (79,72,74). In the latter, participants felt further protected when the HCP explained that the consultations are held in a private room (74).

Not only the location in which the meetings are held influence trust. Jiwa et al. (75) demonstrated that by having medical equipment present, HCPs can increase their trustworthiness. The item that evoked the most trustworthiness was the stethoscope. The stethoscope was linked with the highest odds for the person in the image, being seen as honest, trustworthy, moral, honourable, genuine or ethical, or a combination of these. However, the stethoscope in combination with two or more items had the highest scores for all aforementioned characteristics. (75)

Face-to-face compared to telemedicine

Williamson et al. (77) study reported that participants felt that the HCP contacts were more present during the conversations. They thought that HCP contacts were not distracted by time limitations or other patients waiting. They felt that the HCP were more focused on them and that they could talk more freely over the telephone than in a busy hospital department with other patients waiting. Participants did not feel that the care was lacking compared to face-to face meetings nor did it affect the trustworthiness of their patient-provider relationship. (77) Warner et al. (78) found similar results in their study. Participants had felt that prior to the telemedicine intervention HCPs were often "too busy to worry" and not "really interested." By having personalized texts and phone calls, the participants felt that they had someone to talk to and support them and that they were not forgotten. Participants expressed that they thought that HCPs were more present which helped the trust building in the relationship. This led them to be more open about their personal life and problems. They also expressed their trust in the personalized text messages regarding dietary recommendations. (78) According to Andreassen et al. (79), when a trusting relationship between patient and doctor has been established, the telemedical technology is only a means for communication, but allows for a more in depth and thorough channel for patients to express their concerns (79). Farver-Vestergaard el al. (72) found that the telemedical format could affect the patient-HCP relationship in a negative way and possibly reduce participants trust and feeling of safety. One participant mentioned that he had not been able to open up completely during the

telemedical meetings, stating that it would have been easier to talk in-person and that one could more easily determine if one trusts the facilitator when meeting face-to-face. The study did however find that the working alliance scores in the tele-based intervention were comparable to the face-to-face intervention results. (72) Kazawa etl al. (74) reported that participants in their face-to-face control group had slightly more confidence in their nurse than the telemedical group. This due to lack of technical problems to worry about. (74)

Prior in-person meeting effect on trust building in telemedicine environment

In Brandt et al. (76) a face-to-face meeting was set up before the actual telemedical intervention. This was found to be of great importance for a long-term successful lifestyle change and the strength of the patient-provider relationship. (76) In Williamson et al. (77) study, less than half of the participants had met with their HCP contact. Despite this all off the participants had built a trusting relationship with their HCP contact. Some participants commented that they would have liked to have put a "face to the voice" but that the lack of this did not affect their thoughts on their care. (77) Andreassen et al. (79) found however, that some participants thought that prior knowledge of the HCP is of great importance when starting a telemedical appointment. They meant that a trusting relationship must already be in place before they could trust to start communicating with the HCP. A participant said he would rather go to an outpatient doctor after hours instead of using the telemedicine system if he felt he could not trust or like the doctor he was communicating with. This was linked to the fact that a prior meeting would have helped this trust building. (79) Some of the participants in Sabesan et al. (71) study, found that a prior mistrust in the local healthcare provider led the participants to have unrealistic expectations of the teleconsultation (71).

Encounters impact for trust building

Brandt et al. (76) found that participants who felt that their HCP contact did not listen to them and did not support them in their desired way did not trust their HCP and therefore ended the intervention (76). Participants in Williamson et al. (77) study valued the HCPs ability to empathize and to listen to them and expressed that this was one of the factors influencing their trust in both their HCP and the HCPs ability to provide support and vital information. Participants felt that they could talk more about private matters due to more time and the caring way HCPs encountered them during the phone calls. (77) Participants in Warner et al. (78) study found that the telehealth coach was ""easy to talk to," "engaging," "positive," "approachable," and like "one of the family."" (78) The coach had the opportunity and ability to explain in more detail the problems and solutions when talking over the phone. The longer available time of telephone calls allowed the participants

to ask more questions and not feel rushed. All the aforementioned made the participants feel heard and helped them develop trusting relationships with their HCPs. They also found that the lack of visual cues when talking on the phone or text message did not affect the success of the program. (78) In Andreassen et al. (79) study one participant ended the doctor-patient relationship due to difficulties regarding communication. She felt that the doctor did not take her seriously or respond to her properly. She did not trust her doctor due to lacking interaction and the way the doctor encountered her. (79) Sabesan et al. (71) found that to build a trusting relationship with a patient they often had not met, doctors needed to take time and build a harmonious environment and relationship before starting with the medical treatment (71).

More information regarding HCPs

Andreassen et al. (79) found that patients want to know who they are going to talk to and "who is on the other side" when starting a telemedical communication with a HCP. That the information is personal and that they want to know they can trust the HCP before sharing this information. (79) Sabesan et al. (71) also signify the need for providing information about the credentials of the HCP involved to the patients receiving telemedical care in order to support their trust in teleconsulting and their local health care system (71).

Discussion

The aim of this systematic review was to explore and find the current knowledge in trust between a care seeker and a caregiver who are using telemedicine tools to communicate.

Similar to Mehrotra et al. (80) and Werner's (81) studies, regarding patient characteristics seeking telemedical care, this review did not find any link between socio-demographic factors between patients seeking telemedical care. This could indicate that there is no difference in the perceived trust to HCP based on socio-demographic characteristics. This does not however give a definite answer regarding the socio-demographic impacts on trust to HCP in telemedical environments and would therefore need to be studied closer.

It has been shown that younger people are more used to and are more accepting of telemedicine solutions than older people, and that the acceptance of telemedicine use decreases by higher age (80.81,54). Due to distortion of age focus in the included studies, no clear conclusion can be drawn

regarding age impact on trust in HCP within telemedicine. It is however quite clear, based on earlier studies, that younger people have a tendency to trust telemedicine in general (80.81,54).

Some studies found that mistrust had a strong connection to the participants overall satisfaction. Mistrust in the HCP often leads to mistrust in the telemedical tool in use and further in the whole health intervention. Mistrust or loss of already gained trust can have long term effects on the overall trust of the patient. This lost trust can have consequences for both satisfaction of care and the ability to trust HCPs or the health care system in general for a long time. (40,41) In this review, mistrust or difficulties building trust was often linked with patients prior mistrust, difficulties communicating or understanding each other and how HCP encounter and attitude was perceived. These findings are supported by findings in Hupceys & Millers (41) study. They further reported loss of trust in provider to be influenced by the HCPs perceived competence, lying or not telling the whole truth and the provider not being aware what was going on. (41)

On the other hand, high trust was linked with satisfaction and the desire to continue with the programs. This find is supported by Birkhäuer et al. (44) meta-analysis on the patient-HCP trust and health outcomes. They found that patients who had high trust in their doctor tended to report less symptoms, better health behaviours, a higher quality of life and to be over all more satisfied with the treatment. (44) Other studies have reported the this as well (32, p. 9, 39).

Negative experiences as well as difficulties using the telemedical tools may have an adverse effect on the trust building and the trust in the programs based on the findings in this review. To build this trust however, prior knowledge of the HCP was often key. Participants wanted to know who they were talking to. In many studies, prior knowledge or an in-person meeting with the HCP, was already in place. Many studies mentioned the fact that an in-person meeting beforehand or the combination of face-to-face and telemedical meetings before a telemedical intervention, would have been both the most effective, wanted and beneficial by and for the participants. Participant in other studies have expressed similar wishes and it has been found that an initial face-to-face meeting would be beneficial for both participant and HCP, and would support the trust building in that relationship (52,77,82,83). It could also be beneficial for the HCPs as they need to focus more on the trust development and the development of the patient-HCP relationship instead of care related issues, when there has been just a few or no prior meeting between the two parties. A face-to-face meeting prior to the start of a telemedicine intervention seems therefore to be a good starting point

and base for further trust building, and a way to legitimize telemedical care. (83) Continuity in both the patient-HCP relationship as well as the scheduled telemedical meetings or interventions were found to be contributing to maintaining the trust to the HCP. This has been shown in other studies as well (83,84). Telemedicine seems therefore to be good for continuing an already started care and to maintain the trusting relationship.

On the contrary, prior trust can also have a negative impact. Social trust may play a role in the building of trust. Participants that had prior mistrust in their health care provider were more reluctant to use telemedical tools and to join telemedical programs. Social trust can play a more vital role in the future as doctors and HCPs are more available online. Digital rating systems can mislead and disrupt the patient-doctor trust building before a meeting has ever happened. (58) Pre-existing knowledge and expectations shaped by third parties has already been shown to affect patients perception of the doctor and the decision to trust the doctor (62).

Trust seems to be a substantial contributor for successful long-term positive outcomes. Here trust in the person was most a prominent factor. The fact that there is a trusted person reviewing and giving information to the participants, was the biggest motivator for a successful outcome. This has been found to be the fact in other studies as well (85, 44). Birkhäuer et al. (44) meta-analysis on trust in HCP and health outcome, on the other hand, did not find direct connection with trust in HCP and objective health outcomes (44).

Mechanic & Meyer (86) observed, within three different groups of ill patients, that the way doctors approached the patients played a great role in the perceived trust among patients (86). This was reported in many of the studies in this review. HCP encountering was a major factor in how the participants acknowledged trust to HCPs. Listening, approachable and easy to talk to, empathic and "patient in focus" as well as more time at hand were some characteristics that furthered trust building to HCP according to participants. Telemedicine may impose some hinders for this, especially when not working properly. Not having proper eye contact, the lack of trust in the tool and difficulties hearing were reported as contributing negative factors. This has been reported to hinder patient-provider trust building earlier as well (86). In telephone delivered follow-ups this did not however seem to pose a problem (77,78). On the contrary to Mechanic & Meyers (86) study, disclosure and confidentiality were not factors that were reported. This may be due to participants prior knowledge and trust in the organisation (86).

Strengths and Limitations

This study highlights the vast knowledge gap and the need for further research, as not much has been studied in the area prior to this. It is clear that trust plays a major role in many aspects of patient-HCP relationship in a telemedical environment, yet not much focus has been put on researching this. This study could therefore work as an usher for future research and to show the need for more research.

For this study multiple databases were thoroughly searched. A majority of the searches were done relatively late into the process which enabled the inclusion of newer studies both in the review as in the background. The inclusion and exclusion criteria were relatively strict which kept the search controlled and led to precise and befitting studies. The higher focus on qualitative aspects in this study led to more in-depth knowledge and understanding. However, the included studies are from a broad spectrum of health care fields which gives a wider understanding of trust within health care. This review could therefore work well as a foundation for future research.

There were some limitations to this study. Many factors regarding what affects trust were not discussed in depth in this study. Body language and visual cues were some areas that were not discussed further, that might have played a great role in trust building in visual telemedical environments. Trust is an area that is much studied but can be a challenging concept to define. Trust can be expressed in many different ways and might therefore be difficult to study (34, p. 5, 87). It became clear that it is hard to specify trust and to differentiate indirect and direct trust. In this study, however, focus on the direct reported perceived trust was chosen, to clarify and simplify the searches and the results. During the search however, some studies that did not fit the inclusion criteria, did discuss trust (or indirect trust) by using other definitions and measurements. 'Satisfaction', 'feeling of safeness', 'privacy', 'confidence', 'reliable' and 'believing', were some of the descriptions used to convey the same feeling as trust to HCP by patients. This may have led to missed studies that may have otherwise fit the inclusion criteria. A data search using these terms would most likely have yielded more hits and presumably better and more accurate results. For future studies these terms should be used and studies explaining the trust using these terms should be included. For future research, a look at trust building from the HCP perspective would also be vital in order to understand the dynamic and the HCPs view of patient-HCP relationship trust.

Studies chosen for this study had some factors that affected the validity of the outcome. The majority of the studies had participants around or older than 60 years and had rather small sample sizes. As previously mentioned in the study, younger people tend to be more open and accepting of telemedical solutions (54,80,81). All studies were conducted in high income counties and a major part had had a prior meeting with the HCP or had prior knowledge of them. This can be seen as a contributing factor and distortion of the outcome and the aim. The sample sizes were relatively small in all of the studies.

All the above-mentioned factors affect the validity and the applicability of the outcome. For future research, both a broader age, geographic inclusion, and sample size should be considered. This systematic review was conducted by one researcher. This led to time being limited, searches only being audited by one person and analysis only seen from one perspective. All this in turn increased the risk for bias. By using the Snowball method, the risk for bias is also increased due to databases often suggesting articles with similar results (69). Specific inclusion and exclusion criteria were used in order to minimize the sampling bias, but it cannot be ruled out completely due to this.

Semi-structured interviews were planned as the main data gathering approach for his thesis. It was planned to be done in cooperation with the Finnish Student Health Service (FSHS). However, in the early spring of 2020 the company stopped answering or returning calls. Some weeks later the Covid-19 pandemic started. Together with the supervisors, the team decided a restart and rewrite of the method to a systematic review and aim of the study. All this among other factors decreased the time available to work on the thesis and is a contributing factor for the outcome.

Conclusion

During the Covid-19 pandemic the need for working telemedicine solutions has grown. When the amount of telemedicine solutions and providers grow, it is of significant importance that the patient is able to trust their HCP. How trust is built and maintained in telemedical environments will become increasingly important when health care is moving more and more into telemedicine (88). Earlier studies have shown that telemedicine can be as effective as in-person care (6,8), yet very few studies have been done regarding the relationship and trust building between patient and provider in telemedicine or how the telemedical platform affects the trust.

This study found telemedicine to be a good alternative for health consultations and interventions compared to traditional face-to-face. Trust was reported to play a vital role in building patient-HCP relationships. A trusting relationship and the continual care were reported as important for successful outcomes. However, it seems that trust building may take longer time in telemedical environments. It is on the other hand an ideal place to build up trust, as patient can freely choose the location and time for an appointment. HCPs tend to have more time and can encounter the patient as an individual and this way increase the trusting patient-provider relationship.

A poorly working tool as well as prior mistrust in HCP, may have a negative impact on the trust building in telemedicine surroundings. To gain trust, HCPs must consider this when starting telemedical appointments. However, HCPs encounter seems to be of greater importance and in a more central role for trust building. Telemedicine could, based on the findings, act as means to continue an already started relationship in order to maximise the patient-HCP trust.

Although this study has some limitations, it shows that trust plays a major role in many aspects of telemedical treatment. It is however clear that more research is needed in this area. To get a better understanding on what elements of telemedicine need to be improved, specific inquiries of the factors that influence trust in HCP the most, should be studied in detail. This could be done, as first planned for this study, through interviews with telemedicine users. The users could be both patients as well as HCPs to get a more comprehensive understanding of the phenomenon. The health outcomes and how trust affects objective health outcomes, especially in telemedical environments, needs to be studied further. This is key for the success of telemedicine and the wider implementation of it.

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