Transformation of health professional/patient caring relationships through information and communication technologies used in telemedicine: a scoping review protocol

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Review objectives/questions

The objectives of this scoping review are to examine and map how telemedicine via information and communication technology (ICT) transforms caring relationships between health professionals and patients and how this transformation is conceptualized.

The questions of this review are:

i) What types of concepts are used to characterize the caring relationships between health professionals and patients when ICTs are used in telemedicine?
ii) How does ICT used in telemedicine transform caring relationships between health professionals and patients?
iii) What are the knowledge gaps regarding the influence of telemedicine on caring relationships between health professionals and patients?
iv) What methodologies can be recommended for future research, after the transformation in caring relationships due to ICTs in telemedicine is in focus?

Keywords Caring relationships; digital proximity; information and communication technologies; interpersonal relations; telemedicine

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Introduction

The increased use of health technologies contributes to the transformation of health care. On the one hand, this transformation is intended to increase efficacy, replace tasks performed by humans with machines, increase collection of heath data, monitor patients' health data, support patient autonomy by increasing patient knowledge, reduce health costs, etc.[1] On the other hand, part of the transformation goes beyond functional, supportive and financial matters.[2] Health technologies are not isolated instruments that can be implemented and diffused in health care without affecting the order and context of health care or how healthcare systems are experienced and understood.[2,3] As such, the implementation of health technologies seems to have an extensive influence on health care. This implementation might transform the relations the users have and how they think of themselves, their social and physical environment, families, friends and next of kin. Social media, such as Facebook and Twitter, are examples of technologies that influence and transform interpersonal relations in general. In particular, the concept of friendship has changed due to Facebook, which supports the ability to have many friends, yet the characteristics of these friendships differ from close face-to-face friendships.[4,5] Similarly, in the area of health care, health technologies are suggested to influence: i) the caregivers (health professionals), who would provide care and treatment through technologies; ii) the care receivers (patients), who would receive care without being physically present; and iii) their mutual relations.[1,2]

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Health technologies vary in types and specificities and range from small instruments and wearable devices (such as thermometers, sphygmomanometer, step counters and activity monitors) to robotic-assisted rehabilitation training devices. Other health technologies are information and communication technologies (ICTs) used for remote monitoring, storing, consulting and therapy, as well as the exchange of information regarding patients' health, such as blood pressure, heart rate, temperature, etc. In the field of telemedicine, ICT is frequently used.[6,7]

Telemedicine literally means ''healing at a distance''[6,7] and the significance of proximity has often been debated, as telemedicine seems to replace face-to-face contact. When using ICTs, contact is mediated by smartphones, computers, televisions, apps, web-cameras or other types of electronic networks instead of direct face-to-face contact. As such, a common attribute of ICTs is the substitution of a physical co-presence during use. The ICTs used in telemedicine interventions, characterized by remote monitoring and interactions, influence the caring relationship between patients and health professionals by adding new perceptions of proximity, connectivity and interactivity; hence, the question becomes: what constitutes caring relationships when ICTs replace physical proximity? Traditionally, physical proximity has been taken for granted, as health professions are considered human practices in which a relationship is essential. Observation, examination and touch have always been important sources of information that healthcare professionals can rely on (e.g. color and texture of skin, odor and body language, etc.). With the use of telemedicine, ICTs and other health technologies, it seems that health professionals must learn to rely on auditory and digital visual cues (named ''digital proximity'' by some[3]) to determine problematic issues regarding the patient, rather than visual and physical contact.[3] Therefore, there seems to be a transformation in the caring relationship between patients and health professionals where proximity is at stake. This transformation may influence future health care, as it is expected that the field of telemedicine and the use of ICT will continue to grow rapidly. Still, the transformation of caring relationships due to ICT and telemedicine seems to be unchartered territory.

A preliminary literature search on the areas of ''caring relationships'', ''telemedicine'' and associated definitions was performed in 2017. This search revealed a lack of clarity between definitions, and the terms eHealth, mHealth, telehealth and telemedicine seem to be used inter-changeably throughout the literature.[8] The preliminary search was performed in the following databases: CINAHL, PubMed and Cochrane Library; 18 reviews were found that revealed different aspects of telemedicine and associated definitions.[7-25] Half of these reviews were scoping reviews with diverse focuses, such as mapping telehealth and eHealth interventions,[8] defining eHealth,[19] mapping telemedicine and eHealth for specific patients groups, patients of specific ages[14,16,17,21,22] or specific telemedical interventions.[13,15] The rest of the reviews represented other types of reviews, such as systematic/literature reviews or narrative syntheses, focusing on specific diseases and the use of telemedicine and eHealth,[11] definitions[18] or different interventions and their effectiveness.[9,10,12,20,23-25] Only two systematic reviews were found that addressed some aspects of transformation in the caring relationships between health professionals and patients when face-to-face relations are replaced by telemedicine.[1,12] Ekeland *et al*. found that people who perform self-monitoring at home or have video consultations feel more confident and empowered, with better knowledge and improved health outcomes, as well as experiencing better relationships.[12] Still, the paper failed to report what constitutes a ''better relationship'', and in which ways the digital relationship was deemed better than face-to-face contact. The other review revealed that telehealth interventions may either enable or limit the possibility for relationships between patients and health professionals,[1] but failed to describe what constitutes the relationship. As such, these reviews either focused on the *effect* of telemedicine compared to face-to-face encounters[12] or they focused on the fact that telehealth interventions may *transform* the caring relationships.[1] However, they lack descriptions of the transformation itself. In addition, it is noted that more research is needed, with a focus on the mechanism for transformation in caring relationships.[12] This indicates that there is a lack of knowledge of how ICTs used in telemedicine influence caring relationships between patients and health professionals and how this transformation in caring relationships is conceptualized, discussed and described in the literature.

In light of the above, this scoping review will focus on the caring relationships and is designed to review

the transformation that telemedicine interventions, with the use of ICTs, have on caring relationships between patients and health professionals.

Inclusion criteria

Population

The target population for this scoping review is patients and health professionals, and this review will consider studies that include adult patients, 18 years or over, receiving care and/or treatment through ICTs used in telemedicine, as well as their relatives if they are involved in the care/treatment. Furthermore, all health professionals involved in care and treatment of patients will be included.

Concept

The concept is the transformation or change in caring relationships when ICTs are used in telemedicine. The relation is defined as a caring relationship between a patient (a care receiver/recipient who is a person in the need of care, help and/or treatment), and a health professional (a caregiver/provider who is a person educated to help patients). As such, caring relationships between friends, relatives, and colleagues with the use of ICT are not the focus of this scoping review. An inter-professional technology-supported relation between health professionals is also not the focus of this review.

Context

The context is the use of telemedicine via ICT, compared to a face-to-face context. Therefore, this scoping review will only consider studies that have been conducted with patients receiving telemedicine at a physical distance from the health professionals, similar to in a community, homecare setting, and care facility in and outside the hospital. Telemedicine, understood as care and treatment over a distance, is the concept examined by this scoping review.[6,7] As such, the use of telemedicine ICT to deliver health services and transmit health information over both long and short distances is a condition for studies to be included in this review. This delivery might include video conferencing, web conferencing, text messaging and digital image transmission. This review will include both a one-way use of ICT, such as the monitoring of a patient at a distance and surveying by health professionals, with no opportunities for interaction; and a two-way use of ICT, where monitoring, surveillance and/or interaction are possible.

Types of studies

This scoping review will consider all types of literature, such as reviews (e.g. scoping, systematic, syntheses) and experimental and intervention study designs, such as randomized (and non-randomized) controlled trials. If relevant, prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies will be considered for inclusion. Qualitative studies (with designs such as phenomenology, grounded theory, ethnography, qualitative description, action research and so on) will be searched for relevance. Finally, unpublished grey literature (such as theses and dissertations) will be considered for inclusion in this scoping review.

Methods

In preparation of the present protocol, Joanna Briggs Institute guidance for the conduct and reporting of scoping reviews was used and will be followed throughout the entire review.[26]

Search strategy

An initial limited search of MEDLINE (via Ovid), Cochrane Library and CINAHL will be undertaken to identify articles on this topic, followed by analysis of the text words contained in the titles and abstracts and analysis of the index terms used to describe these articles. This search will inform the development of a more comprehensive search strategy based on keywords and index terms tailored for each information source. A full search strategy using all the identified keywords and index terms will be conducted in all the included databases (the initial example of searches in CINAHL and Web of Science is found in Appendix I). The reference list of all the included studies will be screened for additional studies. Studies published in Scandinavian languages (Danish, Swedish and Norwegian) will be included, along with studies published in English. Data from non-English studies will be translated into English before presentation in the final review, and the original findings will be provided in brackets. Papers published from the year 1990 until present will be included. The year 1990 was chosen because, around that time, the categories of eHealth and medical informatics became index terms in the literature databases.[19] If relevant, the reviewers intend to contact the authors of the primary studies or reviews for further information.

Information sources

The databases to be searched include: MEDLINE (via Ovid), CINAHL, Cochrane Database of Systematic Reviews, Web of Science, PsycINFO and Scopus. Sources of unpublished studies and grey literature will include: ProQuest Dissertations and Theses and OpenGrey.

Data extraction

Data will be extracted from papers included in the scoping review using the draft data extraction tool listed in Appendix II by two independent reviewers. The data extracted will include specific details about the populations, concept, context, and study methods of significance to the scoping review questions and specific objectives. Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer. The authors of the papers will be contacted to request missing or additional data where required. The draft data extraction tool will be modified and revised as necessary during the process of extracting data from each included study. Modifications will be detailed in the full scoping review report. A flow chart of the study selection procedure of each step of the review will be performed, detailing when exclusion occurred as well as the reasons for exclusion.

Data mapping and presentation of the results

The extracted data will be jointly mapped in an appropriate manner that aligns the objectives of this scoping review. The mapping will represent a graphical illustration of the influence of telemedicine on caring relationships divided into areas relevant for the mapping (e.g. studies representing different gaps in research, year or period of publication, countries of origin, area of practice (clinical, policy, educational etc.), and research methods. In addition, a narrative summary will accompany the mapped results and will describe how the results relate to the review's objectives and research questions.

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Appendix I: Search strategies

Web of Science
Search conducted on October 26 2017

#5	#4 AND #3 AND #2 AND #1 *DocType = All document types; Language=All languages;*
#4	TS = (interaction* or relation* or communicat* or dialog* or alliance* or proximit*) *DocType=All document types; Language = All languages;*
#3	TS = (patient* or citizen* or resident*) *DocType = All document types; Language = All languages;*
#2	TS = (nurse or nurses or physician* or doctor or doctors or "occupational therapist*" or "physical therapist*" or "health professional*") *DocType = All document types; Language = All languages;*
#1	TS = ("health technolog*" or Telecommunicat* or telehealth* or telenurs* or telemedicine or telecare or ehealth or mhealth or "mobile health") *DocType = All document types; Language = All languages;*

CINAHL (via EBSCOhost)
Search conducted on October 26 2017

#	Keywords, text words and index terms	Limiters/Expanders
S52	S43 NOT S50	Search modes - Boolean/Phrase Limiters - Published Date: 19900101-; Language: Danish, English, Norwegian, Swedish Search modes - Boolean/Phrase
S51	S45 OR S46 OR S47 OR S48 OR S49 OR S50	Search modes - Boolean/Phrase
S50	infant*	Search modes - Boolean/Phrase
S49	paediatric*	Search modes - Boolean/Phrase
S48	neonate*	Search modes - Boolean/Phrase
S47	children	Search modes - Boolean/Phrase
S46	child	Search modes - Boolean/Phrase
S45	(MH "Child+")	Search modes - Boolean/Phrase
S44	S28 AND S43	Search modes - Boolean/Phrase
S43	S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42	Search modes - Boolean/Phrase
S42	Physical Therapist*	Search modes - Boolean/Phrase
S41	Occupational Therapist*	Search modes - Boolean/Phrase
S40	(MH "Occupational Therapists") OR (MH "Physical Therapists")	Search modes - Boolean/Phrase
S39	Health professional*	Search modes - Boolean/Phrase

(*Continued*)

#	Keywords, text words and index terms	Limiters/Expanders
S38	Physician*	Search modes - Boolean/Phrase
S37	Doctor*	Search modes - Boolean/Phrase
S36	Nurses	Search modes - Boolean/Phrase
S35	Nurse	Search modes - Boolean/Phrase
S34	(MH "Physicians+")	Search modes - Boolean/Phrase
S33	(MH "Nurses+")	Search modes - Boolean/Phrase
S32	Resident*	Search modes - Boolean/Phrase
S31	Citizen*	Search modes - Boolean/Phrase
S30	Patient*	Search modes - Boolean/Phrase
S29	(MH "Patients+")	Search modes - Boolean/Phrase
S28	S17 AND S27	Search modes - Boolean/Phrase
S27	S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26	Search modes - Boolean/Phrase
S26	Interpersonal*	Search modes - Boolean/Phrase
S25	Alliance*	Search modes - Boolean/Phrase
S24	Dialog*	Search modes - Boolean/Phrase
S23	Dialogue*	Search modes - Boolean/Phrase
S22	Relation*	Search modes - Boolean/Phrase
S21	Communicat*	Search modes - Boolean/Phrase
S20	(MH "Communication+")	Search modes - Boolean/Phrase
S19	Interaction*	Search modes - Boolean/Phrase
S18	(MH "Interpersonal Relations+")	Search modes - Boolean/Phrase
S17	S5 AND S16	Search modes - Boolean/Phrase
S16	S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15	Search modes - Boolean/Phrase
S15	mhealth	Search modes - Boolean/Phrase
S14	ehealth	Search modes - Boolean/Phrase
S13	Telecare	Search modes - Boolean/Phrase
S12	Telemedicine	Search modes - Boolean/Phrase
S11	Telenurs*	Search modes - Boolean/Phrase
S10	Telehealth	Search modes - Boolean/Phrase
S9	Health technolog*	Search modes - Boolean/Phrase
S8	Digital health technolog*	
S7	S5 AND S6	Search modes - Boolean/Phrase

(*Continued*)

#	Keywords, text words and index terms	Limiters/Expanders
S6	TI Provider interaction with the electronic health record: The effects on patient-centred communication in medical encounters	Search modes - Boolean/Phrase
S5	S3 AND S4	Search modes - Boolean/Phrase
S4	(MM "Professional-Patient Relations+")	Search modes - Boolean/Phrase
S3	S1 AND S2	Search modes - Boolean/Phrase
S2	(MH "Professional-Patient Relations+")	Search modes - Boolean/Phrase
S1	(MH "Telecommunications+")	Search modes - Boolean/Phrase

Appendix II: Data extraction instrument for papers included in the review

Reviews, quantitative, qualitative research and grey literature:

Author, year, country	The audience of the text	Aim/purpose/ scope/ hypothesis/ phenomena of interest/intention	Study design and methods	Number of participants/ papers (for reviews)	Illness/ disease of the patients	Type of health care setting (context)	Type of telemedicine (concept)	Intervention (concept)	Results/ findings (future perspectives)	Author conclusion	Aspects regarding caring relationships