E-health enabled integrated care teams, what makes them effective? – Medical Leadership

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1. Introduction

The worldwide population is aging, meaning that the prevalence of patients living with chronic diseases and comorbidity will increase (Gillespie, Mörlin, Hammarlund-Udenaes, & Hedström, 2012). Chronic conditions do not exist in isolation but occur alongside other chronic conditions. The prevalence and severity of comorbidities increase in an aging population (Piccirillo et al., 2008). Elderly place a burden on healthcare and long-term care, because high costs are associated with the health of older people (Bloom et al., 2015). These problems exert pressure on healthcare systems throughout Europe (Currie & Seddon, 2014). Expenditure on healthcare by European governments is growing, both absolutely and relative, and it is expected to increase over the next decades (Przywara, 2010). This challenge requires innovative solutions: to transcend access problems and to reduce costs for the providers and the patients (Bujnowska-Fedak & Pirogowicz, 2014). Information and communication technologies (ICT) are promising to be beneficial for these issues. Those information and communication technologies are shown to be even essential for a modern, cost-effective way of delivering healthcare services (Murray, May, & Mair, 2010).

ICT in healthcare aiming to improve quality of care, widen access and increase efficiency of services are called e-health or telemedicine (Mair et al., 2012). E-health has the potential to improve the health of individuals and performance of healthcare providers, by improving quality, creating cost savings and increasing engagement of patients in their own care (Blumenthal, 2010). Furthermore, e-health also can be used to achieve the "Triple Aim" (Sheikh, Sood, & Bates, 2015), originally developed to improve the United States' healthcare system. The Triple Aim consists of the following three individual goals: 1. improving the experience of care from an individual perspective, 2. improving the health of the population and 3. reducing the cost of care per capita (Berwick, Nolan, & Whittington, 2008). The attention for the overarching aims needs to be balanced, otherwise quality might be increased, but also the costs. Alternatively, costs might be decreased as well as the quality (McCarthy, Klein, & Fund, 2010). E-health can be used to achieve the Triple Aim, what states the importance of e-health implementation.

For sustainable e-health implementation, an assessment to identify potential challenges is an essential step during the start-up phase (Jennett et al., 2003). The Model for Assessment of Telemedicine (MAST) serves as an assessment model for this purpose. MAST can be used for decision-making on use of telemedicine applications. MAST is a structured framework for assessing the contribution to quality of care and effectiveness of telemedicine applications, based on users and stakeholders' needs. MAST was developed through a developmental process with workshops consisting of users and stakeholders and was based on a systematic literature review (Kidholm et al., 2012). This assessment tool was developed based on research on seven predefined domains. One of the seven domains of the multidisciplinary assessment are 'organizational aspects' (Kidholm et al., 2012), this domain will be extended in this thesis.

E-health is often referred to as a 'disruptive innovation', what means that e-health has the potential to change the vision of people, related to the way they look at future care (Weinstein et al., 2014). The literature, current experiences and recent studies indicate that the 'organizational aspects' domain is a challenging domain during implementation of e-health innovations. A domain consisting of major facilitators and barriers; both on the micro and meso level and on the macro level (Mair et al., 2007). E-health creates the opportunity for actors in the (health)care chain to co-manage a patient while being geographically dispersed (Chen, Murphy, & Yee Jr, 2013). This requires (health)care professionals to (partially) collaborate in a virtual setting, something which requires attention on individual, institutional and even (inter)national level.

Sustainable implementation of e-health in chronic care teams requires a complex method of changes and interventions with the aim to redesign and recombine different pathways. These pathways are existing of healthcare, social care, informal care and self-care (Urosevíûa & Mitlûb, 2014). Before widespread emerge of e-health solutions, professionals were operating uniprofessional, in so called silos (Kwankam, 2012). The dynamics that entail a transition of integrating such old 'silos' require changes in interdisciplinary collaboration and specific (medical) leadership (Jansen, 2008). Interdisciplinary collaboration and (medical) leadership will both be future subdomains of the MAST domain 'organizational aspects'. Preliminarily data from a Pan-European pilot study and earlier documented reports indicate that engagement of healthcare professionals, especially physicians, is a major challenge for teams during e-health implementation (ACT, 2015; Busetto, Luijkx, Ellissen & Vrijhoef 2016). Thus, earlier research emphasizes the importance of interdisciplinary collaboration and medical leadership. Furthermore, in achieving the goals of Triple Aim by e-health, a recent research also implied the importance of family physicians providing leadership to improve health information

technology and better serve patients (Phillips, Bazemore, DeVoe, Weida, Krist, Dulin, & Biagioli, 2015).

The existing MAST framework consists of seven relevant domains based on the EUnetHTA Core Model, MAST does not provide in-depth indicators. Also, related implementation interventions are not provided. Each domain within the MAST framework need further development (Kidholm et al., 2012). This research sets out to investigate (a) factors and (b) relevant interventions, influencing interdisciplinary collaboration and medical leadership during the sustainable implementation of e-health. Those factors and interventions will be useful for managing the change of integrating the old 'silos' into e-health enabled integrated care during the implementation. The importance of soft factors (the behavioral aspects of management (also called human factors) (Wilkinson, 1992)) is stated in a recent study, it is concluded that behavior change is one of the aspects that should be added to improve the MAST-model (Ekeland & Grøttland, 2015).

By collecting factors and interventions related to interdisciplinary collaboration and medical leadership, a contribution can be given towards sustainable e-health implementation. Besides the 'organizational' domain of MAST will be extended with (a) an additional, in depth set of indicators aiding (pre-)implementation assessment and monitoring and (b) interventions to overcome challenges within these aspects in the MAST-domain 'organizational aspects'.

1.1 Research question

To contribute to sustainable e-health implementation and to extend MAST the following research question is put forward;

Main question:
What affects effective interdisciplinary collaboration and what is the role of medical leadership during and after sustainable implementation of e-health enabled integrated care for European elderly?

1.2 Definition of key constructs

The main research questions are embedded in a complex context. In order for a right interpretation of these questions some constructs need more explanation, namely e-health, integrated care, effective collaboration, medical leadership and others. The key constructs, as used in this research, are defined in the following paragraphs.

Definition e-health:

E-health has been given a lot of definitions, to clarify the term, the definition of Eysenbach (2001) is used, because throughout the internet, this definition is most cited (Oh, Rizo, Enkin, & Jadad, 2005). Eysenbach defined e-health as follows; "E-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology" (Eysenbach, 2001). In this research, promoting embedded interdisciplinary collaboration by e-health is the aimed end result.

Definition integrated care:

"The management and delivery of health services so that clients receive a continuum of preventive and curative services, according to their needs over time and across different levels of the health system" (WHO, 2008). As integrated care takes place across different levels of the health system and over time, integrated care will partially take place in a virtual setting. This will be an important context of a part of this research. Besides, this definition requires for collaboration to be multidisciplinary. A true integrated chronic care approach demands tailored stakeholders, depended on the needs of the individual, meaning that each integrated care system is (somewhat) different around every individual patient (van der Eijk et al., 2013). In this research, only indicators and interventions of integrated care teams will be gathered.

Definition indicators/factors:

According to Patton (1987), an indicator in the management field is used to set goals and direction, but a direct cause-and-effect relationship is not necessary (Patton & Forest, 1987). Another definition of indicators is related to decision makers, namely; indicators enable decision-makers to assess progress towards the achievement of intended outputs, outcomes, goals and objectives (Brizius & Campbell, 1991). In this research indicators are seen as: factors, topics, influencers, as well negative as positive, (in)directly impacting collaboration.

Definition 'intervention':

An implementation strategy is a bundle of implementation interventions. Implementation interventions are methods and/or techniques designed to enhance adoption of a clinical intervention. Clinical interventions are: clinical practices, delivery systems, organizational

arrangements or health promotion activities (Curran, Bauer, Mittman, Pyne, & Stetler, 2012). In this research intervention is seen as: strategies, tactics and activities with the intention to improve collaboration between team members.

Definition integrated care team(members):

In this research, team members are defined as: professionals in the health care, allied healthcare professions, social care, informal care and self-care. Health care is what most people assume as general care (general practitioners, hospitals workers, medical specialists etc.). Social care is defined as: the relations and activities involved in meeting the emotional and physical requirements of elderly, and the social and normative frameworks within these requirements (Daly & Lewis, 2000). Informal care is the care where family, friends and neighbours take care of another person. Self-care is the patient caring for himself in general by for example taking medications or regular exercise (European Patients Forum, 2014). Unique of an e-health enabled integrated care team is the team composition, the patient and informal carer can communicate with (health)care professionals. Based on an already conducted literature study, team processes and team structure (which consists of structure and size) have an impact on interprofessional teamwork (Xyrichis & Lowton, 2008). Smaller sized teams are more effective than larger teams (Poulton & West, 1999) relating to the structure, teams with more occupational diversity are also more effective (Borrill, West, Shapiro, & Rees, 2000). In this research the team composition (members and structure) will be investigated in relationship to indicators and interventions impacting interdisciplinary collaboration.

Definition 'effective (interdisciplinary) collaboration':

Eikey (2015) defined collaboration as follows: "Planned or spontaneous engagements that take place between individuals or teams of individuals, whether in-person or mediated by technology, where information is exchanged in some way (either explicitly, i.e., verbally or written, or implicitly, i.e., through shared understanding of gestures, emotions, etc.), and often occur across different roles (i.e., physician and nurse) to deliver patient care. At its core, collaboration involves the development and testing of rules of engagement and shared understanding that facilitates how people work together in shared spaces." The definition of effective collaboration is aiming to be successful in achieving the intended result, here collaboration between professional disciplines, informal carers and patients by means of e-health. In this research an overview will be made on indicators and interventions impacting effective interdisciplinary collaboration, which is the aimed end-result.

Definition medical leadership:

In successful implementation, physician champions and leaders play an important role. As key players, physician champions need to recognize the qualities of a leader and they have to cultivate them (McGrath, 2005). Therefore, medical leadership is an important part of this study. Medical leadership is defined as: "the active and positive contribution of doctors within their normal working roles to maintaining and enhancing the performance of the organization which itself recognizes this commitment in supporting and encouraging high quality care" (Spurgeon, Barwell, & Mazelan, 2008, p. 214) In this research, the role of the doctor will be investigated in an e-health enabled integrated care field during an implementation phase.

1.3 Sub-questions

To answer the research question, the following sub-questions were formulated:

RQ 1: *What are key aspects of effective interdisciplinary collaboration during sustainable implementation of e-health enabled integrated care?*

RQ 2: *What interventions would facilitate effective interdisciplinary collaboration during sustainable implementation of e-health enabled integrated care?*

RQ 3: *What is the role of doctors/medical leadership in e-health enabled interdisciplinary care?*

1.4 Context

This master research will be performed within a European multi-centered research project. On this moment services are tested in several development sites within three projects throughout Europe. The aimed end result is to realize care integration across boundaries of healthcare and social care. This synergies project is founded to identify common indicators and interventions between the different projects and development sites. Furthermore, it was aimed to promote collaboration between the three individual projects and have publications together. These three projects are seen as a major opportunity to study in depth the ways in which various European pilots actually realized integration healthcare and social care.

These pilot projects are all focusing on offering integrated care, which takes the patient's wishes and needs into account, but these pilots are not totally patient-centered. 2500 years ago, Hippocrates defined a good physician, his definition of a good physician is: I put the patient first and I will respect the patient's opinion/view. I will not hurt the patient. I will listen to and inform the patient well (Peerdeman, 2016). This definition indicates delivering care and taking the patients' wishes into account, but is not totally based on patient-centered care.

Recent definitions of patient-centered care are: "providing care that is respectful of and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions" (van der Eijk et al., 2015, p.16) and "care that is respectful of and responsive to individual patient preferences, needs and values (Greene, Tuzzio, & Cherkin, 2016). Based on a recent publication, patient-centered care based on the individual person can be defined as: "care in which individuals' values and preferences are elicited and, once expressed, guide all aspects of their health care, supporting their realistic health and life goals." (Westphal, Alkema, Seidel, & Chernof, 2016, p.20). In this research, the focus will be more on the 'supply' side of care, namely integrated care taking the wishes of patients into account, but it is not totally based on the individual persons' wishes and consequently not totally patient-centered.

2. Theoretical framework

2.1 Medical (e-)leadership

In this chapter only the most important medical leadership models will be discussed. There are some leadership models published, but none of them is (even partially) focussing on a virtual setting. However, these general leadership models have some common (theoretical) concepts. These concepts could be relevant for this research. It is assumed possible for concepts mentioned in leadership models in a non-virtual setting to be generalizable to a virtual setting.

Physician leadership competences	Clinical leadership competency framework (NHS, 2011)	Raamwerk medisch leiderschap (RML) (KNMG, 2015)	LEADS (Leads, 2013-2015)	Medical leadership competency framework (NHS, 2010)
Personal competences	Demonstrating personal qualities -Developing self-awareness -Managing yourself -Continuing personal development -Acting with integrity	Personal development Serve as an example to others Take responsibility	Lead self -Are self-aware -Manage themselves -Develops themselves -Demonstrate character	Keep the focus on contribution on delivering and improving services to patients
Competences related to other individuals and teamwork	Working with others -Developing networks -Building and maintaining relationships -Encouraging contribution -Working with teams	Visibility Influencing others Coaching and managing other individuals Connecting	Engage others -Foster development of others -Contribute to the creation of healthy organizations -Communicate effectively -Build teams	Create opportunities to bring individuals and groups together to achieve goals Motivate and focus a group to accomplish change
Competences related to managing and using resources	Managing services -Planning -Managing resources -Managing People	Organising Sustainable use of means	Develop coalitions -Purposefully build partnerships and networks to create results -Demonstrate a commitment to customers and service -Mobilize knowledge -Navigate socio-political environments	Overcome barriers to implementation
Competences related to improving	Improving services -Ensuring patient safety -Critically evaluating -Encouraging improvement and innovation -Facilitating transformation	Improving quality of care Managing and innovating	Achieve results -Set direction -Strategically align decisions with vision, values and evidence -Take action to implement decisions -Assess and evaluate	Question the status quo Educate and inform a key people who influence and make decisions
Competences related to changing	Setting direction -Identifying the contexts for change -Applying knowledge and evidence -Making decisions -Evaluating impact	Leading with a vision	System transformations -Demonstrate systems and critical thinking -Encourage and support innovation -Orient themselves strategically to the future -Champion and orchestrate change	Appraise options, and plan and take action to implement and evaluate improvements Act as a positive role model for innovation Develop creative solutions to transform services and care Model the change expected Articulate the need for change and its impact on people and services Promote changes leading to system redesign

Table 1: Overview of different general medical leadership models.

As medical leadership in an e-health enabled integrated care setting partially takes place in a virtual setting, some virtual teamwork background will contain useful information. Powell *et al.* (2004) delivered such a virtual teamwork model in 2004, this model is displayed below in figure 1.
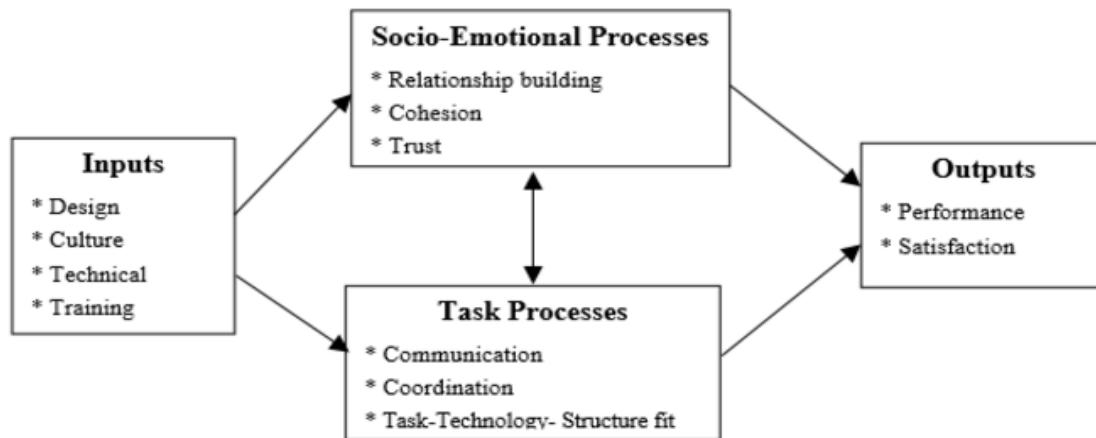

Figure 1: Focus of early virtual team research (Powell, Piccoli, & Ives, 2004)

3. Methodology

A mix of methods (combination of qualitative and quantitative research methods) is used to perform this research. Data is collected by means of different sources; each of these different sources will be explained in the different upcoming paragraphs:

- Systematic literature reviews
  - Medical (e-)leadership
  - Indicators and interventions for effective interdisciplinary collaboration
    - All information on physicians/medical leadership is also gathered in this literature review
- Earlier documented reports
- Site visits: pre-visit questionnaire, focus groups, in depth interviews

4. Results

In figure 1, a flowchart of the systematic review on medical leadership is shown. Out of the 917 abstracts screened, 44 articles were included in the qualitative research.
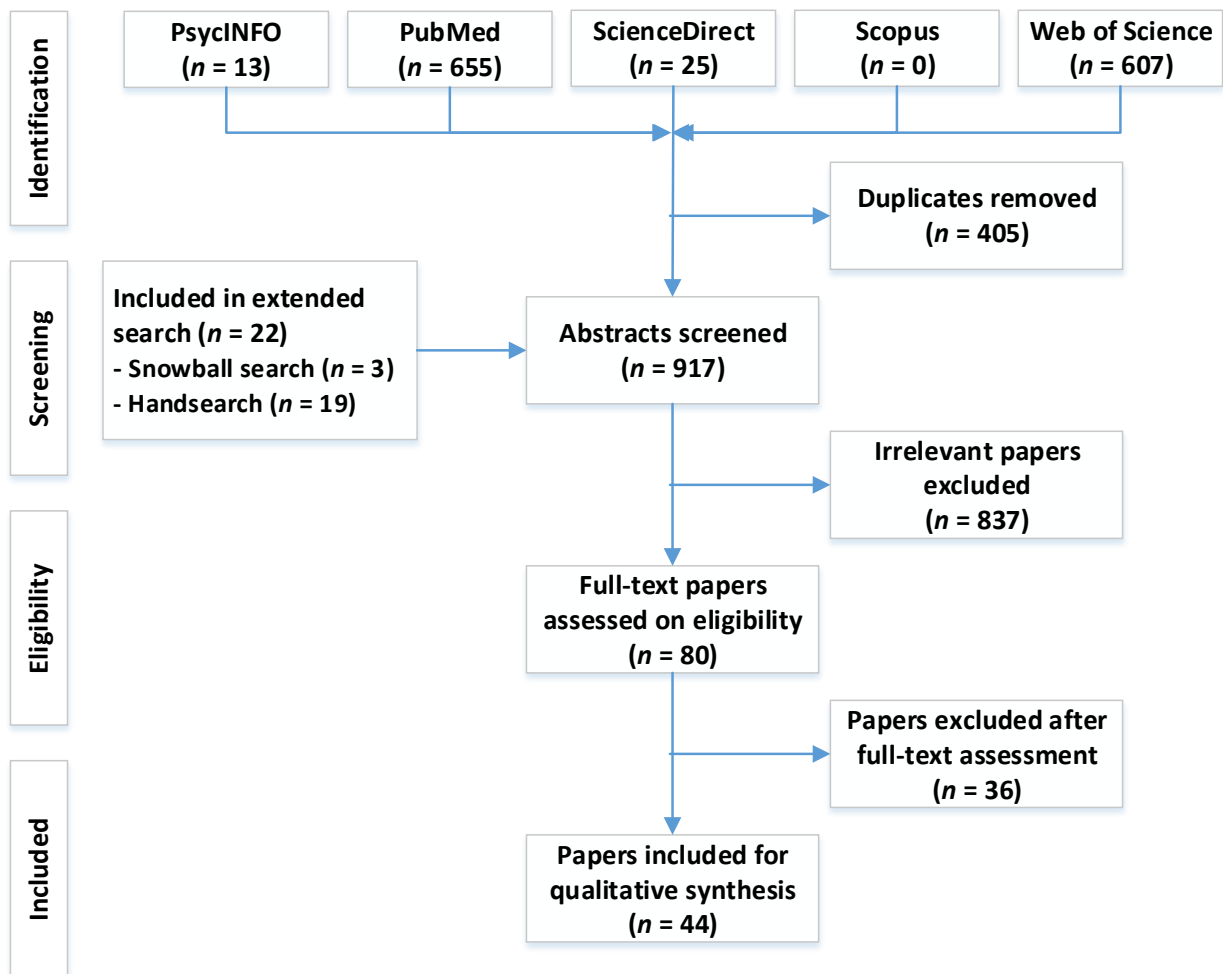
Figure 1: Flowchart systematic review on medical leadership

All abstracted data was thematically synthesized, which resulted in six themes. Three themes were earlier proposed by Powell *et al.* (2004): Theme 1: resources, theme 2: task processes and theme 3: socio-emotional processes. All 44 included papers were screened for specific leadership content, which resulted in theme 4: leadership in virtual themes. Furthermore, two new themes emerged: theme 5: physician-patient relationship and theme 6: change management. A more detailed description of the themes is confidential.

In the systematic review on indications and interventions for successful interdisciplinary collaboration, the code for physicians was with 9% one of the most frequent themes. A short description of the theme physicians as revealed in this review is as follows: physicians are the most critical factor in implementing e-health enabled integrated care teams. Before usage, they see it as a threat of their autonomy. However, after actually experiencing e-health, they become more enthusiast. It is essential to have physicians as commissioners of e-health services. Physicians have to be a champion, they have the best arguments for expanded use and behaviour of physicians directly influences other team members, for example nurses. A more detailed description of the results of this systematic review is confidential.

A survey was spread throughout Europe. 411 questionnaires were send and in total 291 responses were received. After removing the non-complete and non-usable responses, the sample consist of 159 responses, out of which 27 physicians. This part of the research showed that general practitioners are a major barrier in communication and relations with other professionals, especially in Southern Europe. Overall Southern Europe is scoring on average, but the scores of physicians perceived by other team members, decreases the overall score significantly.

In earlier document reports (names are confidential) it was mentioned that physicians need to learn new techniques to treat patients from a distance, furthermore they have to learn the importance of communication standards by training in communication and coordination.

In the series of interviews (n = 81), it is often mentioned that economic incentives are from major importance to change behaviour of physicians. Also engaging and involving physicians is from major importance, they need to have knowledge about their exact role and about the role of other team members. Knowing their role in the overall process will lead to more active communication. Physicians are often seen as a hierarchical barrier, something which is often embedded in old traditions. Social workers are often seen as less important by physicians. However, it is still important for physicians to have a complete overview of the patients, for which they have to see the importance of other disciplines, especially social care. Multidisciplinary meetings are an important tool for physicians to learn the role and importance of other disciplines. Right now, they are not educated for this new way of working. To change physicians, they have to see and experience the benefits of collaboration or they need to have economic benefits. A more detailed description of the results is confidential.

5. Conclusion / Discussion

Physician medical leadership is of major importance in working in an integrated mode. Physicians are stated to be facilitating champions and are seen as commissioners of integrated care. Physicians are essentially leaders to implement e-health enabled collaboration successfully in an integrated care setting. They are potentially important in building rapport with patients, in change management and -as stated before- in leadership roles. They have to take into account task processes and socio-emotional processes, which is important because the relationship with patients and other professionals changes a lot by sustainable e-health implementation. Before actually experiencing e-health, physicians are the most critical factor. However, they still see e-health as a threat to their professional boundary. Sometimes there are also some hierarchical barriers. When physicians are reluctant, their attitude need to be changed before they can become e-health champions or true medical leaders of this century. This research showed that physicians' behaviour can be

changed after good experiences, showing e-health's substantial added value. If this added value is not enough to change them, they may need economic incentives. This implies that this subject matter is of importance also to those who affect the systems and regulators or governing bodies of health care in each of the regions studied in this thesis.

Right now, all (e-)leadership models discussed in the theoretical framework note such provision of resources, motivating others and connecting people as leadership roles. These aspects also came forward in this research. However, these models are not focussing on a virtual context. The first systematic literature review revealed new themes namely, leadership, physician-patient relationship and change management, which are aspects that need to be added to the virtual teamwork model of Powell et al. (2004). While the general leadership models -out of table 1- have to take the virtual context into account, they need to be focused on the changing physician-patient relationship and in order to be effective it would require much more attention for the implied crucial socio-emotional processes.

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