Understanding the interplay of Motivation and Contextual Factors in eHealth Acceptance:

A Qualitative Study Exploring
Healthcare Professionals' Perspectives

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UNDERSTANDING THE INTERPLAY OF MOTIVATION AND CONTEXTUAL FACTORS IN EHEALTH ACCEPTANCE:

A QUALITATIVE STUDY EXPLORING HEALTHCARE PROFESSIONALS' PERSPECTIVES

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ABSTRACT

The uptake of eHealth is necessary to keep good quality healthcare available for everyone. Therefore, the intention to accept technology has been studied by scholars for years. Researchers agree that motivation is a strong predictor for technology acceptance. Until now, little research has been done to reveal healthcare professionals' motivations for technology acceptance and the role of contextual factors. To enhance current empirical and practical knowledge, this exploratory study explores professionals' motivations and how these motivations are fostered and thwarted by contextual factors. Motivations are explored with the self-determination theory, which provides the opportunity to explore healthcare professionals' motives and how these are influenced by social contextual factors. As healthcare professionals' context includes more than social contextual factors that could foster or thwart their motivations, the human, organization and technology –fit model was used to map other contextual factors.

Given the exploratory character of this study, a qualitative method provided rich data. Twenty-four healthcare professionals participated in semi-structured interviews. After healthcare professionals shared their views on eHealth, and some participants shared their own experiences, a scenario of a far-reaching innovation was presented, developed with the method referred to as people activities context and technology and additional motivations and factors were gathered.

The present study shows two drivers of motivations. First, motivations are regulated by identification, meaning these motives are driven by a goal the healthcare professional identifies with. For instance: contributing to patients' quality of care. Second, motivations are regulated by integration, which means the healthcare professionals' motivation is driven by the fact that accepting eHealth is fully in line with their own values and beliefs.

Striking, is that enhancing patients' quality of care, drives both types of motivations. Four categories of contextual factors were identified using the human organization technology-fit framework. Self-oriented factors, such as eHealth affecting healthcare professionals' competence to fulfil his job, patient-oriented factors, such as patients' skills for self-care with technology, organisation-oriented factors, such as culture, structure and finance and technology-oriented factors, such as system quality are identified to healthcare professionals' motivation. These contextual factors affect healthcare professionals' basic needs for autonomy, competence and relatedness either positively or negatively, which barrier intrinsic motivation and the internalisation of extrinsic motivations. Internalisation of extrinsic motivations, sorts in higher persistence, more creativity, conceptual thinking, a positive work attitude and stronger engagement.

The present study provides first steps towards a deeper understanding of healthcare professionals' motivations for eHealth acceptance and the interplay with contextual factors. The results show the relevance of a conceptual integration of the self-determination theory and human, organization and technology-fit model to understand healthcare professionals' motivations and articulates the importance of studying the interplay of healthcare professionals' motivation and the role of contextual factors in the context of eHealth acceptance. Directions for further research and practical implications are presented.

Keywords eHealth, healthcare professionals, motivation, human organization technology-fit, acceptance

INTRODUCTION

The dynamic healthcare sector faces challenges: regulations and quality standards increase, people getting older and for a longer period are in need for more complex care. At the same time, fewer resources are available to keep good quality healthcare available for everyone. Besides, there is the tendency of patients becoming more demanding and take up an active role in their care (self-care). With self-care, classic roles of healthcare professionals (HCPs) and patients change, as patients become co-decision makers (Ursum et al., 2011). At the same time, healthcare's quality standards increase and HCPs' work environment is becoming a more controlled environment, with its strict procedures and protocols that have to be followed step by step. For HCPs, every potential mistake is a threat to their reputation and license to operate. Healthcare and HCPs are under pressure. Within this context, eHealth is presented as a promising solution and is referred to as use of modern information and communication technologies, specified as Internet technology to support and improve healthcare (Krijgsman et al, 2016).

Evidence regarding eHealth effectiveness in comparison to traditional care methods is growing. However, implementations in hospitals are lacking, also in the Netherlands (e.g. Geenhuizen & Faber, 2018; Granja, Janssen and Johansen, 2018; Krijgsman et al, 2016; Kruse et al, 2016; Vollenbroek-Hutten, Tabak, Jansen-Kosterink & Dekker, 2015). For HCPs there is a lot at stake when eHealth is at play, as they need to be able to use the technology, rely on the system as well as their patients using it. Therefore, hesitation to accept eHealth technologies would be understandable. This line of reasoning is supported by Chau and Hu, who in 2013 found HCPs are key to successful technology implementations. Understanding HCPs views on eHealth acceptance within their organisation with colleagues and patients is important, as HCPs are key for succesful eHealth implementations (Chau & Hu, 2002).

Ever since the introduction of information and computer technology, scholars focussed on predicting individuals' technology acceptance (Geenhuizen & Faber, 2018). Behavioural intention is found to be a strong predictor for individuals' behaviour, for instance technology acceptance (e.g. Fishbein & Ajzen, 1975; Ajzen, 1991). However, regarding HCPs' intention to accept eHealth there is more at play than an individual's intention to use a technology, as multiple users (HCPs, patients, management) and technology are at play. The unified theory of acceptance and use of technology (UTAUT) includes social, psychological and technological factors to predict individuals' intention to accept eHealth (Venkatesh et al, 2013). Grounded in strong models from behavioural science, such as Fishbein and Ajzen's theory of reasoned action and Davis' technology acceptance model, UTAUT makes it possible to predict 70% of individuals' intention to accept technology (Venkatesh et al, 2003) Despite this advantage, there is

dispute regarding UTAUT's appropriateness in healthcare contexts, as the models' many constructs make it difficult to use (Chau & Hu, 2002).

Although UTAUT's appropriateness in healthcare context is questioned, researchers do widely agree on motivation being a key predictor for individuals' intention to accept technology. Motivation is explained as being moved to perform behaviour (e.g. Touré-Tillery & Fishbach, 2014; Vallerand & Bisonette, 1992) and is frequently distinguished between intrinsic motivation and extrinsic motivation. Intrinsic motivation is an inner drive that leads to action. Extrinsic motivation is an action driven by influences outside an individual, such as receiving a reward or approval or avoiding punishments (Deci & Ryan, 2000).

Given the importance of HCPs' role regarding successful eHealth implementations, HCP's motivations, contributing to or undermining their intention for eHealth acceptance, provide valuable insights in order to accelerate acceptance. Therefore it is surprising that, in the context of eHealth acceptance, HCPs' motivation remains an under researched area. Moreover, regarding HCPs' intention to accept eHealth, there is more at play then motivation at an individual level, as HCPs are not there in their organisations by themselves; they are there within a certain context, including patients, management, legislations and technology. Therefore, in the context of HCPs' intention to accept eHealth, contextual factors need to be taken into account (e.g. Chau & Hu, 2002; Venkatesh, Morris, Davis & Davis, 2003; Vitacca, Scalvini, Spanevello & Balbi, 2006; Yarbrough & Smith, 2007) Although motivation as a predictor for behavioural intention has been studied widely, there is little knowledge regarding HCPs' motivation for eHealth acceptance and the interplay with contextual factors

The aim of this exploratory study is to reveal HCPs' motivations as predictors for their intention to accept eHealth and explore the role of contextual factors, which enhances current empirical and practical knowledge. In the context of eHealth acceptance, the present exploratory study addresses the under researched area of motivation that has been pinpointed in several studies as a key predictor of technology acceptance (e.g. Chau & HU, 2002; Davis, Bagozzi & Warshaw, 1992; Venkatesh et al, 2003; Yarbrough & Smith, 2007).

THEORETICAL BACKGROUD

Motivation as a predictor for healthcare professionals' intention to accept eHealth

Yoo, Han and Huang (2012) aimed for a deeper understanding of the role of individuals' intrinsic and extrinsic motivation in technology acceptance, by regrouping UTAUT's concepts into intrinsic motivation and extrinsic motivation. Intrinsic motivation influences employees' intention directly. Extrinsic motivation was found to influence employees' intrinsic motivation directly. Other researchers found extrinsic motivation does influence behavioural intention directly (Vallerand & Bisonette, 1992).

Although there is agreement on the importance of motivation for technology acceptance, there is no consensus about the roles of intrinsic and extrinsic motivation. In their study in 2002, Chau and Hu refer to Payton when they articulate that HCPs' personal characteristics differ from other user groups. HCPs are more pragmatic as they value usefulness over ease of use, they are less influenced by their peers' opinions compared to other users, are reluctant to implementations and operate autonomously (Chau & Hu, 2002). Six years later, Yarbrough and Smith (2007) added additional personal characteristics as they pinpointed HCPs' values regarding patient care as a characteristic affecting their intention to accept technology. Personal characteristics could influence HCPs motivations, therefore, are taken into account in the present study.

Humans have different types and levels of intrinsic and extrinsic motivation and are confronted with motivation or absence of motivation (Deci & Ryan, 1985). With their so called self-determination theory (SDT), Deci and Ryan provide a deeper understanding of how social contextual factors foster or thwart individuals' motivation and thereby their psychological well-being. For this study, SDT's perspective of motivation, influenced by social contextual factors is suitable, as HCPs operate in a social context and is elaborated in the upcoming sections.

Motivation from a self-determination theory perspective

With the meta-theory of SDT, Deci and Ryan (1985) articulate individuals' motivations can vary to the extent to which they are autonomous or controlled. When motivations are fully autonomous, and they stem from feelings of joy, pleasure for the activity itself, they are fully integrated with individuals' values and beliefs (Deci & Ryan, 1985). This type of motivation, referred to as intrinsic motivation and requires fulfilment of HCPs basic needs to experience autonomy, where there is a sense of free will, feel competent to do their job and experience relatedness with for instance colleagues an patients (Deci & Ryan, 1985). On the other hand there is extrinsic motivation, where motivations do not stem from feelings of joy or personal interest as they are instrumental to obtain a valued goal (Deci & Ryan, 2000). Extrinsic motivations are less self-determined, however can be strong when a high sense of self-determination is experienced and are in line with individuals' goals and values.

In the context of eHealth acceptance, more self-determined motivations are desirable as they are stronger, compared to less self-determined motivations (Deci & Ryan, 2000). Moreover, more self-determined motivations result in in higher persistence, creativity, cognitive flexibility and organisation supported behaviour compared to more controlled behaviours. These strong mental states are favourable in the complex healthcare context (Gagné & Deci, 2005). Two of SDT's sub-theories explain intrinsic and extrinsic motivation and together provide the opportunity to specify HCPs motivations and the influence of social contextual factors and included in the present study.

Intrinsic motivation as a predictor for healthcare professionals' intention to accept eHealth

According to SDT, intrinsic motivation is the strongest kind of motivation and it is present in each one of us. Environments can foster or thwart individuals' motivation (Deci & Ryan, 1985). Furthermore, Deci & Ryan (1985) state that intrinsic motivation results in more creativity, a higher persistence an better learning capability. Twenty years later, Gagné & Deci (2005) add cognitive flexibility and a positive attitude towards the organisation. Aforementioned mental states are beneficial from an organisational perspective, as implementing eHealth is found to be challenging (e.g. Krijgsman, 2016). To illustrate, HCPs' motivation can stem from pleasure or interest in the activity itself, as for them, using eHealth is an interesting or joyful aspect of their work (Deci & Ryan, 1985;2000). In aforementioned situation, HCPs experience a high extent of autonomy when accepting eHealth coms from feelings of personal interest joy or novelty (Deci & Ryan, 2000). In this ideal situation, HCPs' intention to accept eHealth, is fully integrated with their own values and beliefs. However, given HCPs' highly controlled work environment, which was addressed previously, inherent pleasure of accepting eHealth is not to be expected as currently implementations are lacking behind their potential (e.g. Geenhuizen & Faber, 2018; Granja, Janssen and Johansen, 2018; Krijgsman et al, 2016; Kruse et al, 2016; Vollenbroek-Hutten, Tabak, Jansen-Kosterink & Dekker, 2015). According to SDT, HCPs' intrinsic motivation to accept eHealth can only be fostered when senses of joy, personal interest or novelty are experienced (Deci & Ryan, 1985;2000). Furthermore SDT's the cognitive evaluation theory (CET) shows how intrinsic motivation can be fostered or thwarted, by affecting individuals' basic needs for feeling a sense of autonomy, feeling competent to perform a behaviour, for instance accepting eHealth and experiencing relatedness to other people such as colleagues or patients. These so-called basic psychological needs are also at play with extrinsic motivation.

Extrinsic motivation as a predictor for healthcare professionals' intention to accept eHealth

Extrinsic motivation stems from an external goal, reward or pressure (Deci & Ryan, 2000). In organismic integration theory, (OIT) Deci & Ryan (2000) detail different types of extrinsic motivations. These motivations differ by an individuals' perceived extent of self-determination or, autonomy. To illustrate, HCPs can be extrinsically motivated to accept eHealth as for then it is instrumental to to avoid mistakes, receive rewards, earn more money or obtain a higher status. It is because of the instrumental functions, in order to obtain personal valued goals, that extrinsic motivations can be internalised. Internalisation of extrinsic motivations means they become more in line with HCPs own values, which means they are more self-determined and stronger motivations. Moreover, this view of extrinsic motivation provides additional social factors to understand and foster HCPs' motivations in an organisational context. Four types of social contextual factors that foster HCPs' motivation are, experienced pressure, received

rewards, personal value and feelings of own choice (Deci & Ryan, 2000). These different drivers of motivations are represented in Figure 1.

Gaining a deeper understanding of different types of extrinsic motivation in the context of eHealth acceptance is beneficial for organisations, as using eHealth is not expected to be a task that stems from feelings of personal interest and joy for all HCPs. Therefore, understanding how to foster extrinsic motivation by addressing specific social contextual factors, helps to enhance HCPs feelings of autonomy, relatedness and competence, which result in higher persistence, creativity and higher feelings of well-being (Deci & Ryan, 1985;2000).

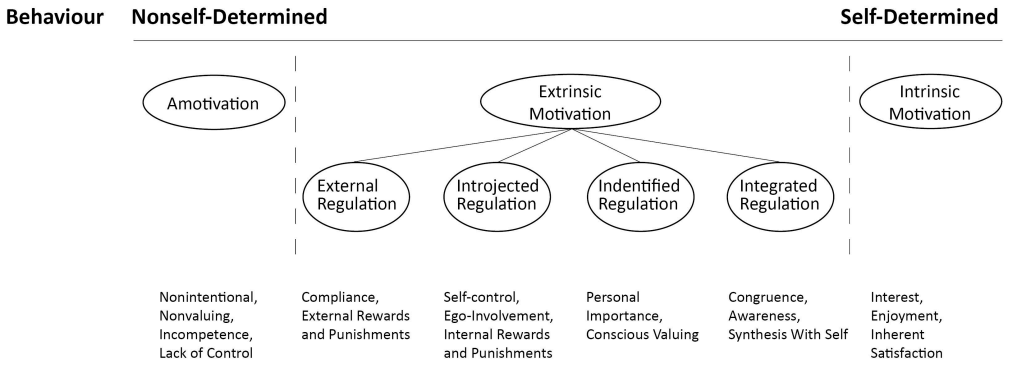

Figure 1: Motivation framework, based on: Self-determination Theory and the Facilitation of Intrinsic Motivation (Ryan & Deci, 2000b, p. 72).

The framework presented in Figure 1, specifies four drivers of extrinsic motivation: (1) external regulation, where motivation is driven by laws and regulations and behaviour is fully controlled, (2) introjected regulation, where motivation is driven in order to protect ones self-image, and the extent of self-determination is higher and the motivation is stronger. (3) Identified regulation, where motivation is driven by ones identification with a behaviour, which indicates a high extent of self-determination, and (4) integrated regulation, where a motivation is fully integrated with HCPs own beliefs, this is the strongest type of extrinsic motivation: behaviour is self-determined to a high extent. At the right side of the model, is intrinsic motivation is represented. To obtain a higher internalised extrinsic motivation, such as integrated motivation, fulfilment of HCPs previously explained basic needs are required (Gagné & Deci, 2005). Last, at the left side of the model, there is amotivation. When amotivated, HCPs have no motivation whatsoever and there is the risk of eHealth rejection instead of acceptance (Deci & Ryan; 2000).

All in all, SDT provides the opportunity to reveal types of motivations and how they are fostered or thwarted by social contextual factors in an organisational context. On the other hand, SDT's applicability for this study has limitations, as it only focuses on social contextual factors and does not provide the

opportunity to map other contextual factors regarding HCPs' motivation fostering or thwarting their intention to accept eHealth. Actually, as stated previously, this area has been left unexplored. To specify these other contextual factors, the organization technology-fit model (HOT-fit) is used (Yusof, Papazafeiropoulou & Stergioulas, 2008).

The interplay with motivation and contextual factors

Ten years ago, HOT-fit, represented in Figure 2, was developed to evaluate the impact of technologies in organisations (Yusof et al., 2008). Successful technological implementations requires finding the right fit between human, organisational and technological factors (Yusof et al, 2008). The framework represented in Figure 2, includes human, organisational and technological contextual factors. Core the model is the reasoning that successful implementations require a right balance between aforementioned contextual factors, as they influence each other. For instance, the researchers theorize that system use, influences users' system satisfaction. According to the model, this also holds the other ay around; satisfaction of the system will influence their system use. Regarding this study it is likely that technological factors or system satisfaction influence HCPs' motivations. Although the present study is not an evaluative by nature, HOT-fit's holistic view and framework, makes it suitable. Figure 2 represents the HOT-fit model with technological contextual factors, organisational contextual factors and human contextual factors, which are interrelated and result in net benefits. Also, net benefits mediate human and organisational contextual factors.

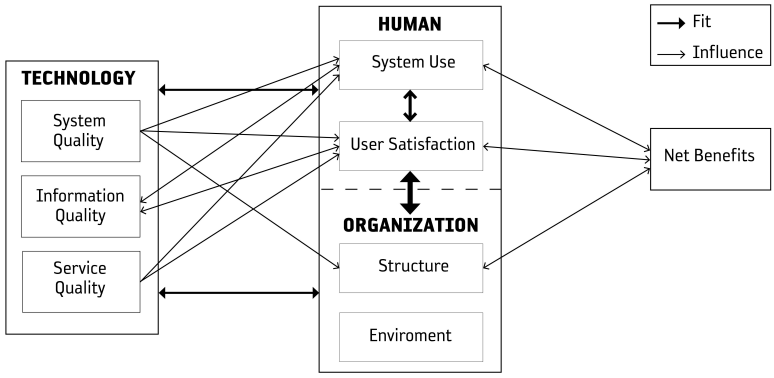

Figure 2: Human Organization Technology-fit (HOT-fit) model (Yusof et al., 2008).

For the present explorative study, HOT-fit's framework offers the opportunity to map additional contextual factors such as organisational and technological contextual factors. Human contextual factors are mapped with SDT, which provides the unique opportunity to get a more thorough understanding of HCPs motivations. A conceptual integration of both models provides the opportunity to specify HCPs motives and pinpoint fostering and thwarting social, organisational and technological contextual factors.

METHOD

The aim of the present explorative study is to explore HCPs' motivation as a predictor for their intention to accept eHealth and how these motivations are influenced by social, organisational and technological contextual factors. Therefore, the qualitative method of semi-structured interview is suitable, as it provides the opportunity to gather different motivations and factors without setting boundaries on forehand (Boeije, 2010; Downs & Adrian, 2004; Vaismoradi, Turunen & Bondas, 2013). Gaining a deeper understanding of HCPs' motivations and the role of contextual factors will help to understand HCPs' view on eHealth and how eHealth affects their work that concerns care for patients, in a high controlled environment, together with colleagues, management and staff. This study is performed in a general hospital in the East of the Netherlands (3,000 employees), where applying innovations such as eHealth is part of the organisational strategy. After approval of the Ethical Committee of the Faculty of Behavioural, Management and Social Science of the University of Twente, data inquiry started. Data was gathered in the period from May up to October 2017.

Participants

To reveal healthcare professionals' motivations for eHealth acceptance and influencing factors, in-depth semi-structured face-to-face interviews were conducted. To participate in this study, HCPs had to meet two criteria: they had to work at the hospital under study and treat patients in their daily work. To ensure the variety of disciplines present in the hospital was represented as much as possible, the method of purposive sampling was used (Boeije, 2010). HCPs were invited by an e-mail that explained the aim of the study, the confidentiality of the interview data and asked for their willingness to participate. Given the exploratory research aim, gathering a wide variety of motivations and factors was important. Therefore, after purposive sampling, the snowball method was used to make sure a variety of motivations and factors were gathered (Boeije, 2010). For this method, the criterion was HCPs had to work at the hospital under study. Participants were asked whom they would recommend to invite for this study. Two participants were recommended for their views on eHealth and were included although they currently do not treat patients in their daily work. When no new categories arose and saturation was achieved, the data collection phase ended.

The final study sample included 24 participants. All 24 participants (14 female, 10 male) work at the hospital and have the age between 27 and 62 years (M= 44 years), have an education degree of at least a four-year college and work on average 9.3 years in the organisation, ranging from 0.5 to 35 years. Twenty-two participants have daily patient-contact. Two participants used to have daily patient contact, however currently hold a coordinating position. Participants' positions are: physician, intern, resident, nurse practitioner, nurse, paramedical assistant and team coordinator.

Semi-structured interviews

After participants were assured about the confidentiality of their data, interviews were recorded after permission and started. First of all, participants were asked to describe their daily work and what their main driver had been to become a HCP. Then, participants were asked if they have any experience with eHealth and how they would describe eHealth. For participants without eHealth experience, the next question was to tell about the reason they currently do not use eHealth and if they know colleagues who currently use eHealth. The next step of the interview was the presentation of a scenario, of a patient using a virtual assistant (VA). This scenario was developed with the method of people, activities context and technology (PACT). PACT provides a framework for a user-centred scenario, in which users engage in activities together with other actors, in a certain context, with a technology (Huis in 't veld et al., 2010). The scenario was reviewed by a field-expert in care and technology and a layperson to ensure the quality and understand ability. The scenario is detailed after the following section

Healthcare professionals with eHealth experience

For participants with personal eHealth experience, the next phase of the interview, before receiving the scenario, was about explicating their experience as much as possible. Initial expectations, revealing motivations, were gathered by questions such as: 'What was the reason you decided to use the technology?' and 'What were your expectations at the start?' Next, basic needs were addressed by questions such as: 'How did the technology affect your daily work and how does this relate to your driver to become a HCP?' Furthermore, participants were asked questions such as: 'What did the technology meant to the relationships with your patients?' and contextual factors were gathered with questions such as: 'Can you describe how the implementation of the technology went?' and 'How were you facilitated?' The semi-open structure of the interview protocol provided the opportunity to enrich participants' answers by asking more in depth questions. After participants shared their experience, the next step of the interview protocol was presenting the scenario.

Scenario with patient Peter and a virtual assistant

The scenario was presented to all participants at a certain moment in the interviews. At the time of this study a virtual assistant (VA) in healthcare in the Netherlands had not been implemented. The scenario was presented as an example of eHealth to trigger participants' thoughts and feelings regarding eHealth when they had no previous experience with these kinds of technologies and besides to ensure participants shared thoughts at a certain point in the interview concerned the same eHealth type. The VA was inspired on the Japanese Gatebox called Hikari, a holographic interactive virtual girl who 'lives' inside a gadget https://gatebox.ai/. Outside, in the environment of this VA, cameras and smart sensors are installed. The VA interacts on a personal level and is designed to be a life companion, with the appearance of a manga figure.

The scenario presented to all HCPs contained the following elements: first a day in the life of Peter with his chronic diseases without the VA was presented. Second, a short video of the VA was presented. With this in mind, a day in the life of Peter with the VA was presented. The VA was present in Peter's house and present on the go, embedded in Peter's smart watch and contained several eHealth functions: personalized information regarding Peters' disease, motivational lifestyle coaching, ambulant data monitoring, filling out questionnaires and, schedule hospital appointments. At the time of the interviews, aforementioned functionalities already exist. However, not integrated into one interactive VA, as presented in the scenario. Furthermore, since the VA is a life companion, it contained also non-medical elements to support other life-domains besides health, such as out loud sharing news feeds, out loud sharing weather information, out loud sharing navigation and a music box.

After the scenario was presented, HCPs were asked questions to reveal additional motivations, for instance: 'What do you think of this scenario?' and 'What would this mean to you as a HCP?' After that the next step was gathering motives and factors, such as: 'What would this scenario mean to you as a HCP e.g. the personal drivers you mentioned previously?', 'What would it mean for your provided care?' 'What would it mean for your contact with patients?', 'How could eHealth be implemented in practice?' 'What would implementation mean to the hospital?', 'What would it mean to your patients?' Interviews typically lasted between forty-five and ninety minutes.

Data-analysis

All interviews were transcribed verbatim and 230 text pages were uploaded to Atlas.ti version 1.0.50, which enables tracking code creation. After rereading and briefly summarizing each interview, the iterative three-step content analysis approach started; focusing at open and axial coding (Boeije, 2010).

First of all, in the open coding phase, data was roughly segmented into two categories; self-oriented factors and patient-oriented factors. Factors were classified as self-oriented, when the participant is

main subject of the sentence, for instance: 'I just enjoy patients more who actively participate in their care compared to patients who only take the prescribed medication'. Factors were classified to be patient-oriented, when the patient is the subject of the text quotation, for example. 'Patients really need to learn to take responsibility'. Later, also organisation-oriented factors and technology-oriented factors were inducted from the data. Here, the quotation focused respectively at the organisation and the technology. For instance about when using technology: 'I believe that when we work better together, the silo's within the organisation will disappear as well'. And regarding technology, 'Well, with this you will receive a lot more information for which you will also held responsible.'

Second, data was deductively coded according to SDT's categories for extrinsic motivation: amotivation, external regulation, identified regulation, integrated regulation and intrinsic motivation [19]. Furthermore, HOT-f it was used as a means to deductively code contextual factors that foster or thwart HCPs' motivation, through affecting HCPs' basic needs fulfilment for autonomy, relatedness and competence (Deci & Ryan, 1985;2000). These deducted subcategories of HOT-fit's contextual factors were information quality and system quality as subcategories of technology. Organisational structure, organisational environment, inter-organisational relationships and financing source are subcategories of organisational factors.

During this iterative coding process, the connection between selected quotations and code categories was discussed with the supervisors. Two times this set of categories was adjusted for agreement. Next to aforementioned four broad categories of factors, subcategories were identified to specify factors as much as possible by axial coding (Boeije, 2012). 'Own job, self-care support, dependency of patients' skills and dependency of system quality, were identified as subcategories of competence. Quality of care and skills were identified as subcategories of 'patient-driven factors'. Aforementioned factors affect HCPs' motivation either positively or negatively. After the codebook was finalised, it was handed to a second independent coder, who was not involved in this research until this stage and coded 56 quotations or twenty-five per cent of all data. The coding procedure resulted in good agreement between coders (Cohen's Kappa of .75).

RESULTS

Most HCPs in this study are motivated to accept eHealth. Although motivations are extrinsic, they stem from a high extent of self-determination and therefore are considered to be strong. These strong motivations are fostered and thwarted by a variety of social and organisational contextual factors.

Healthcare professionals' motivations

This study reveals two types of motivations: goal-oriented motives, referred to as identified regulation, were found by HCPs in all job categories and motives driven by the fact that using eHealth is fully in line

with HCPs' own perspectives, referred to as integrated regulation, were found most by nurse practitioners and nurses with coordinating tasks (Deci & Ryan, 2000). Both types of motivations are not influenced by gender, age or experience. Table 1 represents HCPs' motivations and how often they were found (code groundedness). The codes are illustrated by example quotations.

Table 1 Motives that foster HCPs' intention to accept eHealth deducted from SDT (Deci & Ryan, 2000)

Motivation Type	Code groundeness	Example Quotation
Identified regulation (17 participants)	22	When a patients' weight has been increasing.... they often call when they start experiencing problems... such a pitty! When you would have known about this earlier, than it would be possible to intervene in an earlier stage!
Integrated regulation (5 participants)	9	Thus, we are going to offer people something that really has added value…. for their illness and maybe also on other levels. To me, that would be really interestig.

Identified regulated motivations predicting HCPs' intention to accept eHealth

First of all, in general, HCPs are motivated to accept eHealth when the technology for them is instrumental in realising a valued goal, such as providing good quality healthcare. Here, HCPs' motivation is driven by a goal the HCP identifies with, referred to as identified regulation (Deci & Ryan, 2000). This extrinsic motivation stems from a high extent of self-determination and therefore is a strong motivator for behavioural intention. Although this motivation type holds for HCPs in all job categories, it is expressed most by HCPs who have a coordinating role in patients' care: physicians, nurse practitioners and nurses with coordinating tasks. The following quotation is illustrative for HCPs' motives that are regulated by identification.

> It could be easier to monitor and coach patients' exercise at home. Currently, people come here and I help them when they exercise. I explain to them how they can exercise at home and I provide them with exercises they can do. Afterwards I always ask patients how their exercising at home went. When I would have a NOA that would keep me up to date… that would make this process a lot easier. (Paramedical professional, no eHealth experience).

Integrated regulated motivations predicting HCPs' intention to accept eHealth

HCPs are driven to accept eHealth when to them, using this technology is fully in line with their own beliefs, referred to as integrated regulation (Deci & Ryan, 2000). From all extrinsic motivations, this type of motivation is the most self-determined and therefore the strongest motivation type. Integrated regulation is shown by HCPs in the different job categories, however, typically by nurse practitioners and nurses with coordinating tasks. The following quotation illustrates motivation that fosters HCPs' intention to accept eHealth, as it is fully integrated with their beliefs.

> In the United Stated there are also hospitals that monitor and treat people who stay at home. To me, that is really providing the best possible care. (Resident, no experience with eHealth)

When fostering HCPs' own values and beliefs, HCPs are motivated to accept eHealth. Most HCPs in this study are motivated to accept eHealth when for them it is instrumental to achieve a valued goal. Few HCPs expressed to really enjoy working witch new technologies. These professionals have the strongest, fully autonomous motivation to accept eHealth, as for them, using these new technologies comes with feelings of joy, interest or pleasure. An illustrative example:

> Personally, I like this, because I am interested in using technology. (Paramedical professional, no experience with eHealth).

Contextual factors fostering healthcare professionals' motivation

Throughout the interviews, a variety of contextual factors were addressed, fostering or thwarting HCPs' motivation, which were categorized as: self-oriented factors, patient-oriented factors, organisation-oriented factors and technology-oriented factors. Table 2 represents categories with fostering and thwarting factors and how often they were found (code groundedness). All codes are illustrated by example quotations. Contextual factors are not influenced by gender, age or experience.

Self-oriented factors fostering HCPs' motivation

Self-oriented factors can either foster or thwart HCPs' motivation, as these factors affect their basic needs for autonomy, relatedness and competence and enhance or undermine senses of self-determination. When one of these three basic needs is thwarted, HCPs' experienced autonomy, feelings of competence and relatedness a decrease, which undermines HCPs' self-determined behaviour and motivation [19]. First, self-oriented factors were identified that foster HCPs' motivation to accept eHealth. An illustrative example:

> With eHealth you have a constant view, as you are being informed about results continuously… Currently, when the patient says it is going well, yeah I leave the care by the patient and it is out of my sight… for me... this could have advantages. (Nurse, no eHealth experience)

Table 2 Contextual factors thwarting HCPs' motivation, identified with HOT-fit (Yusof et al., 2008)

Factors fostering and thwarting motivation	Code groundeness	Example quotation
Fostering factors		
Self-oriented		
Competence (5 participants)	6	I believe it is easier to address problems.. currently, I can only see my share of patients treatment.... it would be better if I could have an overview.
Patient-orientend		
Quality of care (14 participants)	40	In my experience, people who measure their own blood pressure are in a better condition compared to people who don't.
Competence (10 participants)	16	Everyone is able to do simple tasks as measuring blood pressure and taking small blood samples
Thwarting factors		
Self-oriented		
Autonomy (5 participants)	7	In my opinion, when you value your own privacy, you should also value the privacy of your patients...
Competence		
own job (12 participants)	34	With eHealth everything is based on values. In my opinion it is impossible to say, well patients' blood pressure is ok, so then the patients is also okay. At least not in my field.
supporting self-care (5 participants)	7	Patients need self-care support. Who is going to provide this support? I can't.
dependency on system quality (7 participants)	10	What seems challenging to me is the potential risk of information overload. Someone has to filter this information. Who is going to do that? To me, this risk of imformation overload seems to be the most important challenge.
dependency on patients' skills (4 participants)	6	Patients really need to want to manage their own care, otherwise it would not work. That is currently the situation when I discuss lifestyle guidelines with them and that will also be the situation when eHealth is used.
Relatedness (7 participants)	14	Of course, you will still be treating patients, however, I think we have to make sure we will still be able to see patients and not only look at the data. It is about patients you know, not about computers.
Patient-orientend		
Autonomy (11 participants)	20	It is about privacy and... to what extent do you have to measure and know everything? And what can the government or who knows who decide? Are people capable of making their own choices? A lot of ethical aspects come to play here...
Competence (12 participants)	27	You really need tob e carefull regarding to what extent people can handle all generated data. There are people who are really going to focus on that data and get afraid... that is really challenging...
Skills (7 participants)	15	People really have to know how to apply these technologies. There was a study with people using asthma inhalers... well that sames very obvious... only appereantly, people used these inhalers totally wrong. Unbelievable, but true...
Organisation-oriented		
Structure, type, size (15 participants)	42	I really wouldn' t know where to start with something like this.. so I need people who know what patients want, what are implications for ICT? What do we expect? What do we doe with the current processes? The whole organisation will need to change in my opinion...
Vision, culture, strategy (13 participants)	28	There has to be some kind of vision: in five years these are the goalswe want to be accomplished... and what and who do you need to achive these goals... currently, a clear vision is missing...
Healthcare system (11 participants)	17	Over the last 25 years, very little progress has been made in the digitalisation of hospitals. The field were digitalisation happend, such as radiology, are the field were a lot of money could be saved... I can't think of any eHealth system that helped to save a lot of money...
Net benefits (6 participants)	8	How do you calculate benefits? Do you calculate uhm the economic values? Or do you you calculate with benefits for the patients en can we transfer these values into economic values? That's very complex...
Technology-oriented		
Information/ service quality (7 participants)	10	You will receive a lot more information... and everything that you did see, you will be held resposible for.. When you receive more dtata, chances you will overlook anything increase...
System quality (13 participants)	25	The technology also has to be really focussed at patients, not only the hospital! It really needs to support patients, in the hospital data disapears in a black hole, so that is useless.

Patient-oriented factors fostering HCPs' motivation

Throughout the interviews, HCPs shared many factors concerning patients. HCPs belief that using eHealth is beneficial to patients' perceived quality of care fosters their motivation. More than half of HCPs in this study, pinpointed eHealth as a possible contributor to patients' perceived quality of care. Also here, no was found between job category, age or previous experience. An illustrative example:

> Thus, quality of care will be improved as you can easily connect with patients and discuss what they need to improve their care. (Nurse practitioner, no experience eHealth)

Besides, HCPs are motivated to accept eHealth as they believe patients are really able to use technology in their care. Here, with patients' ability, HCPs refer to patients' skills to participate actively in their own care as well as patients' skills using technology and interpreting data.

> I believe more people can use it then you think. 25% can use technology really easily. Also, you see people at the age of 80 who wear jeans and have a smartphone. They are also able to use it! (Physician, no experience eHealth)

An important driver for HCPs motivation is HCPs' belief that using eHealth is beneficial to patients' perceived quality of care. In these motivations, the focus is on the patient instead of the HCP. More than half of HCPs in this study, pinpointed eHealth as a possible contributor to patients' perceived quality of care. There was no difference between job category, age or previous experience. An illustrative example:

> Thus, quality of care will be improved as you can easily connect with patients and discuss what they need to improve their care. (Nurse practitioner, no experience eHealth)

Besides, HCPs are motivated to accept eHealth as they believe patients are really able to use technology in their care. Here, with patients' ability, HCPs refer to patients' skills to participate actively in their own care as well as patients' skills using technology and interpreting data.

> I believe more people can use it then you think. 25% can use technology really easily. Also, you see people at the age of 80 who wear jeans and have a smartphone. They are also able to use it! (Physician, no experience eHealth)

Many of HCPs' factors' identified to foster HCPs' motivation to accept eHealth, are identified as patient-oriented, as they are all about patients. Typically, factors within this category are rather nuanced, as during each interview both opportunities and threats were expressed. An illustrative example:

> Of course I believe it is a good thing when people view their own records. Only… now I tell them what they need to know. Sometimes, a scan reveals something that is harmless. Currently, I have the opportunity to explain to patients 'you need not worry about this, it is

> harmless'. When people view data themself, they can easily panic. That is the problem!' (Physician, no eHealth experience).

Contextual factors thwarting healthcare professionals' motivation

Besides motivation fostering factors, many thwarting factors were identified. For instance, HCPs shared that they are often not the ones who decide which materials and technologies they use. However, they are held responsible for patients' safety and the quality of the delivered care provided with these materials and technologies.

Potential loss of basic need fulfilment thwarting HCPs' motivation

HCPs' feelings of autonomy and their perceived competence and relatedness are thwarted when eHealth is introduced, as the following quotation illustrates.

> We buy materials that are inefficient. We hear that they don't work, however we don't do anything about it. We talk to the industry that says the quality is okay and that's it… who is responsible? In my opinion this should be the person who buys these goods. However, as a physician, I am held responsible, because I use them in my work. That position is really difficult… this holds for all kinds of materials and for computer systems as well. We have to work with those insufficient facilities… while my work constantly needs to be excellent! That is where I am held accountable for… not being able to have control…while the pressure only increases… that's really bad… actually I find it really unacceptable… actually, sometimes I sleep badly because of it… (Physician, experience eHealth)

This quotation illustrates the difficult position HCPs are in and, regarding eHealth that they need to rely on the quality of the system, which affects their autonomy as well as their competence to meet the high quality standards in their every day work. When HCPs' autonomy, competence or relatedness is at stake, internalisation of extrinsic motivations is thwarted. Furthermore, there is the risk of amotivation as a result of feeling lack of control, sorting in feelings of incompetence, which thwarters HCPs intention to accept eHealth and eventually even risks HCPs well-being (Deci & Ryan, 1985;2000).

Second, HCPs' competence is thwarted by system quality as the following quotation illustrates:

> Thus, judging someone based on lab results, other tests and also on how he sits there in front of you… that would be different with eHealth and using an iPad or computer… personally, I think that this is a reason that many people are afraid to make mistakes because of that. (Physician, no eHealth experience)

Furthermore, HCPs' competence is thwarted by their belief eHealth directly affects their own job. An illustrative example:

> Uhm, expectations patients have of you are more difficult to predict when you offer care digitally, when using eHealth. In a 'normal' conversation, we can talk things over. Then, I can ask more questions... with

> eHealth, we experienced this differently. After patients have entered data, they expect a reaction form us! For me, that's really unnecessary... These things really need to be thought through in an early stage and this we did not do. (Nurse practitioner, experience eHealth)

Throughout the interviews, relatedness with patients was expressed as a valued job characteristic by HCPs in all job categories. Here, relatedness means 'a warm professional connectedness' between HCPs and patients. When it comes to eHealth, potential loss of relatedness was addressed by HCPs in all job categories. An illustrative quotation:

> It would be literally be caring from a distance. You will be busier with data then you are with the person behind the data… and that, yeah…it doesn't really fit with my personal drivers. (Nurse practitioner, no eHealth experience)

In the context of eHealth acceptance, HCPs' shared self-oriented motivations that foster and thwart their intention to accept eHealth. HCPs are motivated to accept eHealth, when for them it is instrumental and integrated with their own believes and thereby fosters their competence to fulfil their job. At the same time, throughout the interviews, HCPs eHealth was found to threaten HCPs' basic needs for: autonomy, relatedness and competence. These threats need to be taken into account, as they undermine internalisation of extrinsic motivations stated previously or, result in amotivation, when HCPs experience eHealth decrease their autonomy and increase their feelings of incompetence.

Patient-oriented factors thwart motivation

Although HCPs expressed positive expectations regarding patients' skills, at the same time, patients' required skills to use eHealth are also doubted. More specifically, HCPs doubts refer to the extent to which patients are willing to take up an active role in their care, are capable of interpreting the data being offered to them by means of Health and are capable of using technology. An example quotation:

> When you encounter a long lasting problem, that makes you tired, or you are not a really compliant patient… I think for those it is really hard and this will not work. What you really need for eHealth to be successful, are compliant patients who are motivated as well, that's what I think. (Resident, no eHealth experience)

HCPs' beliefs regarding patients' self-care and skills were found to thwart motivation of two third of the HCPs in this study. However, as pointed out previously, HCPs' views are rather nuanced; their beliefs regarding patients' competence therefore can both foster and undermine HCPs intention to accept eHealth.

Furthermore, HCPs' motivation is affected by their perception of the influence of patients' autonomy, the extent to which patients are free to make their own choices thwarts their motivation. Throughout the interviews, potential negative effects of eHealth on patients' autonomy were stressed by almost half

of all participants, which make this a factor to take into account. In this study, autonomy also includes HCPs' concerns regarding patients' privacy and data-safety. In these factors, HCPs often refer to their own moral standards. Potential loss of patients' autonomy is mentioned by HCPs in all included job categories. An example quotation to illustrate:

> To what extent do we really want to measure and know everything? To what extent will people be free to make their own choices when using eHealth and what organisations van make choices regarding these concerns? ... What if data is not protected well and your Health data affects whether or not you can get a mortgage…these kinds of questions we really should pay attention to when you are thinking about using eHealth. As I believe these will be the important issues in the near future. (Nurse practitioner, no experience eHealth)

Organisation-oriented factors thwarting motivation

Throughout the interviews, a variety of organisation-oriented factors came across: healthcare system, vision, culture, structure and finance are presented as well as their influence on HCPs' motivation. First of all, organisational factors addressed throughout the interviews are about the organisational vision, culture or structure.

> First of all, there has to be a clear vision: these are the things we want to realise in the next five years, what has to be possible… and which disciplines in the hospital need to be involved… at this moment this vision is lacking. (Physician, eHealth experience)

Aforementioned quotation illustrates that, in the perception of this HCP, hospitals' lacking vision on innovation in general and eHealth more specifically, thwarts HCP's motivation as it affects his competence negatively. The following quotation illustrates how organisational culture can thwart HCPs motivation for eHealth acceptance.

> I think that, partly the physician or medical specialist in general is really conservative and will pull the hand break whenever they think that's necessary. For instance, when they believe, eHealth is a threat to hem... You really have to work with different stakeholders to make this successful. These internal stakeholders often have a different interest, which makes it really difficult for innovations, such as eHealth to be implemented: interests and stakes differ too much. (Nurse practitioner, no eHealth experience)

The following quotation illustrates how the organisational structure thwarts HCPs' motivation.

> What I mean is… in this hospital, I do not work with my patients all by myself. There are supervisors, nurse practitioners… in order to make eHealth a success everyone has to work with the technology … the biggest advantage of such as technology is that there is a complete view of a patient… well, therefore, all professionals a patient is seeing need to be included. Also, when another hospital in this area is involved: I really find that important.

> Otherwise…yeah… then you also need to maintain the old fashioned way. (Resident, no eHealth experience)

These two fragments illustrate the complex dynamics of a healthcare organisation, the organisational culture and structure. Organisational factors such as culture and structure are addressed multiple times. Mostly by physicians and nurse practitioners. These factors influence HCPs' basic need for competence. Last, HCPs pinpointed net benefits and available resources as undermining factors. Most of these HCPs were physicians. Examples are illustrated by the following quotations.

> There has been really little progress in the digital development of hospitals over the past twemty-five years… big developments were in radiology… scans and images are easy accessible on your computer now, you don' t have to walk through the hospital, carrying manages under your arm. Here there was a huge financial advantage: it saved money! You did not have to process these images manually and you did not have to store them. Less space and people were needed in this process… and regarding eHealth… actually I cannot recall eHealth technologies, which resulted in saving money… it's more about… gaining a return on investment for those who invest…. (Physician, no eHealth experience)

This quotation illustrates HCPs' uncertainty regarding the benefits of eHealth in terms of money, and quality. The return on investment is about money and quality and both are uncertain. Thus, this factor affects HCPs' motivation as it has an impact on their competence; why invest scarse time when outcomes in terms of quality and money are uncertain? Besides uncertainty regarding the outcomes, some HCPs addressed scarcity of finance and time as barriers.

> Physicians are too busy with their jobs, you don't have the time to really think these things through … that is difficult... when you really need to develop such things, you need researchers. As physicians we can design a study and provide supervision… those people need to be free from their work, so therefore, in the end… it is about money. (Physician, eHealth experience)

Technology-oriented factors thwarting motivation

HCPs addressed the dependence on the system quality, which was identified as a motivation-thwarting technology oriented factor. In the presented quotation, the system quality was not sufficient and it illustrates how low system quality thwarts HCPs and according to these HCPs also thwarts patients' motivation.

> For instance, for people suffering from cardiac rhythm disorder, the technology, which measured their blood pressure, did not work well for them. It resulted in wrong values! High… low… Values just were not trustworthy. Patients started worrying! To me the quality of the technology needs to be guaranteed. I find that really important. (Nurse practitioner, eHealth experience)

Last, information quality was identified to thwart HCPs' motivation. As the example quotation illustrates, information quality thwarts HCPs' basic need for competence.

> When I receive a lot of data, for me it becomes less interesting. I only want to know what I need to know… and nothing more. (Resident, no eHealth experience)

Overall, throughout the interviews, HCP's shared a nuanced view regarding eHealth acceptance. Strong types of motivations were presented, driven by a high sense of self-determination, that lead to active behaviour, high engagement and strong persistence. At the same time, a variety of thwarting factors were identified, grouped into Self-oriented, Patient-oriented, Organisation-oriented and Technology-oriented categories.

DISCUSSION

Present study, for the first time presents healthcare professionals' motivations that foster their intention to accept eHealth. Also, four categories of contextual factors that foster and thwart HCPs' motivations are determined. Integration of SDT and HOT-fit makes it possible to reveal HCPs' motivations at an individual level and specify a variety of contextual factors fostering and thwarting motivation, which is highly interesting as motivation predicts HCP's intention to accept eHealth. Findings in this study bring forth theoretical and practical implications.

Healthcare professionals' motivations to accept eHealth

Results show two categories of motivations: goal oriented motivations, by Deci and Ryan (2000) referred to as identified regulation and motivations that stem form eHealth being fully in line with HCPs' own believes, referred to as integrated motivation.

The difference between these motivations mainly lies within their extent of self-determination. Integrated regulation is the most self-determined, autonomous type of extrinsic motivations, what inherently makes it the strongest motivation type. More self-determined, internalised extrinsic motivations, result in a greater commitment, higher persistence and stronger engagement (Deci & Ryan, 2000). Integrated motivations yields task effectiveness, more creativity, a higher conceptual understanding and positive work related attitudes, which is favourable for individuals and organisations (Gagné & Deci, 2005, p.337).

However, the uptake of eHealth requires patients as well. As HCPs in clinical care are the ones who introduce eHealth to patients, motivated HCPs are vital to involve patients in eHealth programs. In their study in 2005, Gagné and Deci refer to findings of Williams (2006), which at the time of their study was in press, in which healthcare providers' autonomy supporting behaviour resulted into to patients' motivation being more internalised and stronger for successful smoking cessation.

What is striking is the result that enhancing patients' quality is the main driver of both types of HCPs' motivations. This is contrast to findings of Kassirer (2000), to which Yarbrough and Smith refer in their study in 2007. In this study, HCPs in a hospital in Canada got upset when a new technology was introduced, which enhanced patients' active role in their care. More recent studies confirm the finding that improving patients' quality of care for HCPs is the main reason for eHealth acceptance (Granja, Janssen & Johansen, 2018; Timmerman et al., 2017). This difference in HCPs' views on eHealth, might stem from their different cultural backgrounds. For instance, in the Netherlands, fear for computers, referred to as 'computer anxiety' today is not a barrier anymore. It could be that a countries' high general level of technology acceptance, leads to HCPs' thinking about the consequences of use for themselves and for patients. While HCPs in countries where the general technology acceptance level is low, HCPs perceive technology as a barrier in itself.

HCPs being goal-oriented and motivated by their values regarding patients' care is in agreement with previous findings (Chau & Hu, 2002; Yarbrough & Smith, 2007). HCPs prefer technologies' usefulness to ease of use (Chau & Hu, 2002). In previous studies, perceived usefulness focuses on how technology enhances effectiveness of patient care and management (Venkatesh et al., 2003). In other words, here, usefulness mostly concerns the work of the HCP. Findings of the present study indicate HCPs' goal-orientation concerns a broader perspective than 'their own work', as HCPs' goal-oriented motivations, what they find useful, also concern how technology improves patients' quality of care. Therefore, for scholars it is interesting to investigate whether the concept of perceived usefulness holds in the context of eHealth acceptance.

Social contextual factors thwarting motivation

At the time of this study, most HCPs did not have experience with eHealth. When sharing their own perspective on eHealth, in the beginning of the interviews, HCPs typically shared an instrumental view. For instance, eHealth is: 'communicating with patients digitally', 'gaining patients' information more efficiently', 'providing care form a distance', and 'talking on distance with your patient'. In other words, HCPs perceive eHealth as a digital substitute of a part of their current work process. After the scenario was presented, these HCPs typically shared a more holistic view on eHealth and several contextual factors. HCPs who had experience with eHealth typically addressed the factors already before the scenario was presented. Also, these HCPs were not more positive regarding eHealth, as they also addressed many thwarting factors: their experiences were not that positive.

Results identify four categories of contextual factors fostering and thwarting HCPs motivation: self-oriented, patient-oriented, organisation-oriented and technology-oriented factors. These four categories are in agreement with previous findings and add patient-oriented factors to the human factors (Yusof et al, 2008). Factors in all categories affect HCPs' basic needs for autonomy, relatedness

and competence and thereby foster and thwart HCPs' motivation (Deci & Ryan, 2000; Gagné & Deci, 2005). When eHealth is at play, fulfilment of HCPs' basic needs for autonomy, competence and relatedness are at stake (Deci & Ryan, 1085). Here, amotivation and rejection of a technology or even the well being of the HCP are at risk (Deci & Ryan, 2000). Therefore, possible effects of contextual factors on HCPs' basic needs need to be revealed and taken into account at an early stage of the implementation phase or when possible in the technology development process.

A potential loss of competence thwarting HCPs' motivation

First, HCPs' feelings of competence are thwarted by their unknowingness and doubts of patients' skills to use technology and perform self-care. On the other hand, HCPs also shared that patients are capable of self-care with technology. Second, technological factors as system quality and information quality affect HCPs' competence. HCPs need to rely on the system, however in this study typically shared scepticism regarding reliance of technological system and information quality, which is in line with previous findings (e.g. Ammenwerth & Keizer, 2005; Granja, Janssen & Johansen, 2018; Kruse et al, 2016; Ossebaard et al., 2017).

A potential loss of relatedness thwarting HCPs' motivation

When eHealth is introduced, HCPs feel their relatedness with patients is at stake. In the interviews, HCPs explained that face-to-face contacts as well as being able to put an arm on someone's shoulder when needed are key aspects of being a HCP. This is in agreement with previous findings (Chau & Hu, 2002; Kapadia, Ariani & Ray, 2015). Aforementioned potential loss of relatedness is revealed by HCPs in all job categories however is identified most by nurse practitioners. This is worrying, as HCPs in this job-category are expected to use eHealth the most. One the other hand, few HCPs believed relatedness could be improved by use of eHealth, as this technology would make it easier to contact patients more frequently and have a better understanding of their lives.

A deeper understanding of HCPs' motivations, basic needs and the contextual factors, nuances previous findings of HCPs' reluctance to change (Chau & Hu, 2002; Kruse et al., 2016; Ursum et al., 2011). eHealth accelerates the change of HCPs and patients classic roles. This might lead to another type of healthcare professional than the ones that are healthcare professionals at the moment. Hence the question: how to motivate the current generation healthcare professionals such as nurse practitioners for these technologies and become digital-savvy?

Furthermore, HCPs question how eHealth would affect patients' needs. More specifically, in this study HCPs question the extent to which eHealth will actually improve patients' quality of care. HCPs refer to themselves, for instance: how they would feel when being monitored at home twenty-four seven and about their data being shared. These motives are line with a societal discussion that is happening at the

moment regarding the Internet of Things (IOT) in general and more specific the Internet of Healthcare Things (IoHT). Questions such as 'Who decides what is acceptable in what situation for whom?' 'Who decides what is good quality healthcare anyway?' and 'What about patients' perceived autonomy?' are ethical questions and difficult to answer for HCPs in an organisation. However, these questions are relevant and therefore important to address. Furthermore HCPs point out their unknowingness of patients' perspectives regarding these related issues. This is surprising, as eHealth is an instrument to enhance patients' self-care and perceived autonomy in their lives with their (chronic) disease. Therefore, patients' basic psychological needs in the context of their lives with their disease and eHealth in interaction with their HCPs should be examined. To do so, patients needs and perspectives first of all need to be brought to the surface Te Molder, 2012).

Organisational and technological contextual factors thwarting HCPs' motivation

Last, the absence of an innovation-supporting environment for successful eHealth implementations is expressed by HCPs as a factor thwarting their motivation. According to the HCPs in this study, the healthcare system in general and their work environment do not facilitate these kinds of disruptive developments. These motivation-thwarting factors are shared by HCPs with and without eHealth experience. Lack of finance is mentioned a few times, and is found to be a motivation thwarting factor in previous studies as well (Ammenwerth & Keizer, 2005; Granja, Jansen & Johansen, 2018; Gray & Sockolow, 2016; Kruse et al., 2015). However, in the present study, lack of organisational vision, culture, leadership and an innovation supporting organisational climate are mentioned most and are found to thwart HCPs' motivation the most.

Furthermore, by revealing the interplay between motivation and the variety of contextual factors affecting HCPs' basic needs either positively or negatively, this study addresses the complexity of being a HCP in an organisation using eHealth together with patients and other stakeholders, to improve patients' quality of care. This perceived complexity is in agreement with previous findings, which indicate that technologies play an active role and are an actor to take into account, in the network with other actors (Cresswell, Worth & Sheikh, 2010). These researchers refer to findings of Berg, who analysed the active role of an electronic personal health record in mediating relationships (Cresswell, Worth & Sheikh, 2010]. Perceiving technology as an active agent that mediates actors, instead of being 'a dead thing', is also advocated by P.P. Verbeek and offers another dimension to the holistic perspective of the conceptual integration of SDT and HOT-fit (Verbeek, 2005).

Findings in this study contribute to the field of eHealth acceptance, however and are highly interesting from a broader organisational perspective, as most findings concern HCPs' motives and basic needs, which could also provide meaningful insights as a starting point for other (technological) implementations, education and change programs. eHealth accelerates classic roles of HCPs and

patients that were already changing. This asks for an evolution of HCPs as near future HCPs are expected to be technology and data savvy and have strong coaching abilities. Furthermore, presented findings can be beneficial for the field of education, as this field concerns a context in which professionals and children or students are expected to work with innovative technologies as well within a controlled system and increasing their active behaviour, engagement and persistence are desired as well.

Limitations

Several factors may have influenced the presented results, therefore some limitations are acknowledged. Most participants had no personal experience with eHealth. This could have affected their views that as they presented many thwarting contextual factors. Second, the majority of the collected motives and factors are based on a scenario, which is a hypothetical situation. Therefore, caution is needed regarding interpretation of the thwarting factors. Third, the VA technology, illustrated by a short video of an example developed in Japan, might have influenced participants' views, as the VA had the appearance of a manage figure. However, immediately after presenting the VA, the rationale continued with real-life situations. Furthermore, HCPs with eHealth experience were not that positive. Their view might be influenced by the quality of the systems they used. These technologies were still in a developmental phase, which led to an increased workload for HCPs and patients becoming insecure. Despite these factors, contextual factors shared by HCPs' with and without eHealth experience are in agreement with findings in previous studies. Therefore, the appearance of the VA and difference in eHealth experience is believed to not have threatened present study's validity.

Future research

The present study emphasizes studying the interplay of motivation and social and organisational contextual factors in the context of eHealth acceptance. Results in this study provide a fist starting point to build on. Future research should build up on these findings, first of all by further exploring the interplay of motivation and contextual factors when evaluating implemented eHealth technologies. Besides HCPs, other stakeholders such as patients and management should be taken into account. Overseeing these different perspectives in real-life situations instead of a hypothetical situation will help to implement future technologies more successfully.

Second, to further understand the dynamic interplay of actors and factors in an organisational context, it is highly recommended to appreciate the co-shaping role of technology as being an actor in the network with other actors (HCPs, patients, management and contextual factors)(Cresswell, Worth & Sheikh, 2010). The present study took a rather instrumental take on eHealth, as the focus was on the HCP using the technology. The so called actor-network theory (ANT) provides a suitable holistic lens, as it perceives technology as an active agent and its co-shaping role in social processes (Cresswell, Worth & Sheikh, 2010).

Third, implementation of eHealth involves many stakeholders with different perspectives on for instance the concept of 'what is autonomy with use of eHealth?' and 'who determines what is good quality of care?' These issues are important, however tend to remain unaddressed. The meanings of values such as autonomy or privacy today could be different then ten years ago. In the context of eHealth, views of the public regarding these values are needed for further technology development and implementations. In order to address public views, they first of all need to be brought to the surface (Swierstra & Te Molder, 2012). To enhance understanding of multiple perspectives regarding these issues, it would help to create spaces for meaningful dialogs between the different stakeholders, for instance on a regional level.

Practical implications

First of all, current enhanced understanding of HCPs' motivations and the role of contextual factors provides the opportunity for healthcare organisations to enhance implementation strategies. Extrinsic motivation can be a strong self-determined motivator to enhance HCPs' intention to accept eHealth. Therefore, these motivations need to be addressed. Organisations can do this by creating an appealing vision on innovation, that foster HCPs' values or goals and is in line with their patient-oriented motivations. Internalised extrinsic motivations enhance HCPs feelings of autonomy, relatedness and competence, which result in higher persistence, creativity and higher feelings of well-being (Deci & Ryan, 1985;2000). These researched-based insights help to create strong, internalised motivations. Furthermore, based on this vision, meaningful rationales can be created, in which for different context or eHealth technologies, specific contextual factors are addressed. This is necessary as the context of HCPs who treat patients with diabetes mellitus differs from the context of HCPs who treat lung cancer patients.

Second, when HCPs' basic needs are concerned: motivations really are about their values and emotions, which are difficult to change. When considering an eHealth technology, potential effects on these basic needs to be taken into account. How does the technology affect HCPs' basic psychological needs and what can be done to minimalize possible thwarting effects? A promising strategy is to discuss these topics with HCPs in an early stage of the technology development or implementation and together come to decisions, instead of a classical top-down approach. Here, it is helpful to specifically address underlying emotions, as from previous studies we know the only way to address emotions, is through emotions instead of presenting more technological facts (Swierstra & Te Molder, 2012).

When HCPs' concerns are not addressed and incorporated well, the opposite of the desired effect will happen: eHealth rejection instead of motivation. Not as much due to the eHealth technology itself, as to the underlying concerns thwarting HCPs' motivation (Swierstra & Te Molder, 2012). Addressing these in

an early stage of the implementation process is essential in order to create the opportunity to enhance HCPs' motivation.

Third, HCPs addressed their need for reliance on the quality of the eHealth technology. To assure a good system quality, implemented eHealth technologies need to meet at least Technology Readiness Level (Mankins, 1995)]. This level indicates the technology is mature, which will help to foster HCPs' motivation. A suitable technology readiness level should be a perquisite in each technology selection process.

Fourth, offering excellent facilitating conditions will enhance HCPs' motivation, which is supported by findings of Canadian researchers, who found organisational support increases autonomous motivation (Mitchell, Gagné, Baudry & Dyer, 2012). Furthermore, managements' autonomy support contributes to better performance Gagné & Deci, 2005). However, the researchers address more work in this field is needed. When this is not already top of mind in organisations, their HRM departments could benefit from these findings, for instance by offering training programs based on these insights.

Last, lack of finance was found to be factor thwarting HCPs' motivation. A few physicians articulated eHealth investments and benefits do not fall in the same place, which for them is demotivating. A model that is used in an attempt to overcome this challenge is the Social Return on Investment model (SROI). This model helps to indicate the potential impact of an innovation on forehand, by including all stakeholders and specify their goals, investments and the outcomes (Krijsman et al., 2016). These insights could make it possible to negotiate about eHealth technologies on forehand and increase HCPs' motivation.

CONCLUSIONS

Integration of SDT and HOT-fit makes it possible to bring individuals motivations and the influence of a variety of contextual factors to the surface and enhances current empirical and practical understanding of the interplay of motivation and self-oriented, patient-oriented, organisation-oriented and technology-oriented (SPOT) factors. These factors foster and thwart HCPs' motivation as they influence their basic needs for autonomy, competence and relatedness. HCPs' motivations to accept eHealth are extrinsic and strong as they stem from a high extent of self-determination and lead to a higher persistence, stronger persistence and creativity. Enhancing these strong psychological states fosters HCPs' intention for eHealth acceptance and therefore is beneficial for healthcare organisations.

By revealing the interplay between motivations and contextual factors, this study provides a first step in understanding the complex dynamics between motivation and contextual factors when eHealth is concerned. We argue previous presented SPOT-factors need to be taken into account in research and practice, as they directly influence HCPs' motivation and can improve their intention to accept eHealth.

Scholars can build on these findings, for instance by evaluating implemented eHealth technologies and including HCPs', patients and management. ANT is proposed as a helpful theory, as it helps to further understand the mediating role of all the actors as active agents in the network.

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