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## **The roles of primary care middle managers in the implementation of eHealth in Finland: a qualitative interview study**

**Background:** Health care middle managers play a critical role in the implementation of innovations as their actions and behaviours affect the success of implementation. Nevertheless, health care middle managers' experiences of their involvement in eHealth implementation remains an understudied topic.

**Aim:** To describe and understand primary care middle managers' roles in eHealth implementation.

**Methods:** A descriptive qualitative interview study was conducted. A total of ten Finnish primary care middle managers were interviewed in 2020. The data were analysed through inductive content analysis.

**Findings:** Primary care middle managers in Finland perform tasks that fall under support, implementation advancement, managerial, and informational roles. The interactions between these roles may be highly complex when the implementation is part of a national scheme involving numerous organisations.

**Conclusion:** A clear, comprehensive understanding of the roles of middle managers, as well as the linkages between these roles, is critical to creating best practices for eHealth implementation.

**Keywords:** manager role; middle manager; primary care; primary health care; health care management; implementation; eHealth; implementation management; Finland; interview; content analysis

## 1 Introduction

Digital transformation can enable the provision of efficient individualised health care through the effective allocation of resources associated with high-quality health services. There has been a noticeable increase in the amount of eHealth initiatives in clinical practice (Cresswell et al., 2013; Varsi et al., 2015), with this trend particularly strong for preventive health care (Bettiga et al., 2020). eHealth refers to digital technologies which monitor and track health, enable health-related communication among health care professionals and between professionals and patients, as well as collect, manage and use health-related data (Shaw et al., 2017). When successfully implemented, eHealth initiatives have been shown to be effective, safe and efficient (Brettelle et al., 2013; Elbert et al., 2014; Kruse and Beane 2018; Whitehead and Seaton 2016). However, these benefits are often not realised because many eHealth implementations fail (Abbott et al., 2014; Glaser, 2005; Heeks, 2006). Implementation starts with the decision to invest in a new technology and continues until the technology has become part of routine practice (Cresswell and Sheikh, 2013). In this study, the process of implementation is understood to cover technology acceptance and adoption by the staff, deployment, integration, and finally, normalisation and routinisation (Cresswell and Sheikh, 2013).

Several factors, including health care managers' behaviour and role, affect the success of eHealth initiatives (Ingebrigtsen et al., 2014; Van Dyk, 2014). Research on eHealth implementation has mainly focused on senior leaders, with far less attention given to the roles of middle managers (Urquhart et al., 2018). According to Ingebrigtsen et al. (2014), middle management may contribute to successful information technology adoption in health care organisations. Middle managers serve as the bridge between frontline staff and the organisation's top managers. As such, these managers supervise a set of employees or have the power to make decisions that affect either one or two levels of staff in a hierarchical organisation depending on the organisation size and structure (Birken et al., 2012).

The unique position of middle managers, i.e., in between senior management and frontline staff, means that they may be able to influence how innovations are implemented in the organisation (Birken et al., 2016). Earlier research has identified which practices and management behaviours may cause eHealth initiative to succeed or fail; therefore, we have a fairly good understanding of what managers should or should not do during the implementation process (Ingebrigtsen et al., 2014., Kujala et al., 2019). Gaining a more comprehensive understanding of health care middle managers' roles by focusing on their own experiences may provide insight that could improve the rate at which eHealth initiatives are successfully implemented (Varsi et al., 2015).

The term role refers to a set of behaviours that are associated with a certain job or position (Pennington, 2005). According to Mintzberg's (1973) classical role theory, all managers perform the same ten roles regardless of industry, position or organisation size. These ten roles were further divided into three categories: informational roles; interpersonal roles; and decisional roles. The interpersonal roles frame the manager as a figurehead, leader and liaison. The informational roles describe how a manager acts as a monitor, disseminator and spokesman. The decisional roles portray the manager as an entrepreneur, a disturbance handler, a resource allocator and a negotiator.

The "middle manager role theory" by Birken et al. (2012) focuses on how health care middle managers contribute to innovation implementation. The middle manager role theory particularly emphasises the importance of middle managers in transferring information between senior management and frontline personnel during the implementation process. The transfer of information between organisational levels is critical to the implementation process, as problems in the flow of information are a typical reason for why implementation fails. According to the theory from Birken et al. (2012), middle managers have four roles in innovation implementation: information diffuser; information synthesiser; strategy and day-to-day mediation; and selling the innovation. Previous empirical studies have supported, as well as expanded, the "middle manager role theory" (Birken et al., 2013; 2016; Engle et al., 2017; Urquhart et al., 2018). Notably, middle managers have evaluated information diffusion and synthesising as their most important roles, while selling the implementation was perceived as the least important role (Birken et al., 2016). In a recent scoping review, Laukka et al. (2020) found that health care leaders perform roles similar to those identified by Birken et al. (2016) in eHealth implementations. Similarly, Varsi et al. (2015) found that nurse and physician managers take on active roles and feel accountable for the implementation of eHealth initiatives. Although eHealth solutions provide numerous advantages and possibilities, their implementation continues to be a challenge, and further research is required to clarify which factors support health care leaders' adoption of the roles required for eHealth implementation (Laukka et al., 2020).

The aim of this study was to describe and understand middle managers' roles in eHealth implementation in primary care. This study provides information that can be utilised in the planning of primary care eHealth implementations. Furthermore, the provided insight could be leveraged to increase the success rate of primary care eHealth implementations. The research was guided by the following question: Which roles do primary care middle managers serve in the implementation of eHealth?

## **2 Methods**

### **2.1 Study settings**

The study was limited to primary care middle managers, as the focus of health care reforms – both in Finland and on a global level - has increasingly become primary health care systems with the aim of strengthening preventive health services (Ministry of Social Affairs and Health, 2020a; World Health Organization, 2019). Primary care is organised to monitor the health of the general population and provide preventive health and social services (Ministry of Social Affairs and Health, 2020b). In Finland, primary care – which is organised by municipalities and publicly financed – is the cornerstone of the entire health care system. Primary care is typically the route through which patients seek specialist level services; however, the lack of resources that is common to most health care systems results in unnecessary visits to specialist or emergency services (Keskimäki et al., 2019). Keskimäki et al. (2019) have already suggested that eHealth solutions should be used in triage to ensure that patients receive the correct type of treatment in an appropriate location.

The study was conducted in four primary care facilities of varying sizes located in southern and northern Finland. The facilities participate in a national Self-care and Digital Value Services (ODA) project that involves health care and social services reforms with the underlying purpose of building a national system of services to support self-care. One of the services that has been developed and conceptualised in the project is the Omaolo-service, which includes intelligent assessments of symptoms and service needs, an electronic health check-up, well-being check-ups and coaching programmes, as well as periodic health check-ups that mirror traditional primary care. The scheme was set up and managed by a separate project organisation, and the facilities have implemented the service according to this organisation's guidance.

### **2.2 Data collection**

This study applied descriptive qualitative interviews. The data consisted of interviews with ten middle managers from four primary care facilities that had implemented eHealth reforms. A purposeful sampling method was applied (Palinkas et al., 2013). More specifically, interviewees were identified based on their position as middle managers and known involvement in eHealth implementation. This is a common sampling method used in qualitative research to identify individuals with a rich understanding of the studied phenomenon (Kyngäs, 2020a).

The interviews were performed between January and March 2020. The participants were interviewed individually, and the interviews were conducted at the interviewee's place of work or via the Microsoft Teams communication platform. The interviews were unstructured, and the interviewees were asked one opening question ("What was your role in the eHealth implementation?"). The researcher then asked subsequent questions to get the interviewees to elaborate on their answers. The interviews lasted from 28 minutes to 52 minutes, and were recorded with permission, resulting in a total of 344 minutes of data. The recordings were transcribed verbatim, which yielded approximately 44 pages of text in 12pt Times New Roman font and with 1.5 line spacing.

### **2.3 Data analysis**

The data were analysed by the first author using inductive content analysis (Kyngäs, 2020b). An example of the content analysis process is described in Table 1. First, the interview transcripts were read through several times to get an overall understanding of the data. The unit of analysis was either several words or a sentence that described what the manager had done, how they had behaved and the tasks that they had performed during the implementation. All of the identified units of analysis were then condensed from the original expressions into simplified expressions. The simplified expressions were then grouped to form subcategories. Subcategories with similar meanings were then divided into categories, which were further grouped based on similar meanings to form the four main categories.

### **2.4 Ethical considerations**

The necessary research permits had been received from the target organisations before any data had been collected. The interviewees received written information regarding the study before participation and gave their informed consent to participate in the study. The interviewees were also told that participation was voluntary (Finnish National Board of Research Integrity, 2019). In compliance with European Union's General Data Protection Regulation, no individual interviewees can be identified based on the data presented in this study (Mondschein and Monda, 2018).

### 3 Results

All of the interviewed middle managers worked in a supervisory role with either direct subordinates or decision-making power within their facility. Out of the ten interviewees, nine were women and one was male. The interviewees had the following titles: service manager; service supervisor; associate chief physician; project manager; and head nurse. Nine interviewees had a clinical background (one physician, eight nurses), while one had a non-clinical background.

The roles of middle managers during the implementation of eHealth were divided into four main categories: supporter role, implementation advancer role; managerial role; and informational role (Figure 1). Verbatim quotes from the interviews are italicised in the following text.

#### 3.1 Supporter role

A common feature of all the roles categorised under the supporter role was that they involved activities and behaviours aimed at supporting the frontline staff in their implementation efforts by creating (directly or indirectly) a positive implementation climate. All of the interviewed managers felt that their main role in implementation was to encourage and motivate staff members. They supported them by listening to their worries and giving encouraging and motivating guidance.

*“In the implementation phase it was a lot of listening to their worries, we went and looked at it together... like what will it look like and what happens when you do this, and kind of pondered a lot of the content... like how we are going to communicate to the customer.” (M6)*

*“Supporting the new way of working.” (M10)*

Managers engaged staff in the design and planning phases of the eHealth reform to increase staff commitment towards the implementation of the new solution. They reported that it was important for them to make it clear to the staff that they stand behind the eHealth implementation.

*“As a manager or leading the implementation you can’t start to doubt it. That would give a totally wrong message.” (M8)*

*“I have to stand behind it [eHealth implementation].” (M7)*

Managers also described behaviours that relay excitement and enthusiasm towards eHealth. They felt they had to be excited about the eHealth implementation if they were to inspire others. Managers wanted to show an example by being excited about eHealth and using it themselves.

They also felt that showing interest and enthusiasm towards the eHealth implementation provides the task with the priority that it needs.

*“Your own interest is important because no matter how much other work you have, you make it [eHealth implementation] a priority. If it [seems that it] doesn’t interest you it will always be left in the background or take second place.” (M5)*

*” You present it with genuine enthusiasm and convincingly. Employees will notice that I don’t think that this eHealth service was a good choice, and you can’t have that. It needs this [enthusiasm] so it will catch on even a little.” (M4)*

By relaying their own excitement and leading by example, the managers sought to create a climate in which the implementation of eHealth solutions is seen in a positive way.

*“I try to show an example that it’s good to try different solutions and that if we adopt the gems then we can actually influence the way we work... Leading by example is always an important role.” (M9)*

Some managers provided staff with practical support by participating in day-to-day work that included the new eHealth solution. They also attended workshop days arranged by the project organisation. Managers felt it was important that staff members knew that they are there to support them whenever needed. They wanted to imply that they are present by attending staff meetings, training sessions, workshops and being generally available, as described in the following quotations.

*“There were a lot of small things that required a lot of attention and being present and listening.” (M6)*

*“My door is always open, and an employee can always come and tell me how they feel.” (M3)*

Managers championed the eHealth implementation process to staff members and other stakeholders, such as the city council, by justifying the initiative. They felt that they had to be convincing and truly believe in the solution in order to be credible. Managers had to sell and market eHealth, the project and the associated new processes to the staff in order to overcome any resistance to change. They justified why the implementation is necessary and worthy of their time, which was important because the new solution would initially require more work, slow things down and change the way things are done. Managers also explained the reasons behind the implementation and tried to increase understanding on how it relates to the current policies.

*“Be present in certain meetings and talk about digitalisation in primary care because it’s a big step and we need it here so that we can meet people’s health care needs.” (M7)*



*” And then just by selling that this will be a normal tool for us in the future.” (M2)*

### **3.2 Implementation advancer role**

To advance eHealth implementation, managers reported taking on roles that are unique to the implementation phase. These roles involved implementation-specific activities such as organising various parts of the implementation work and day-to-day work. They arranged time for the staff to perform implementation-related work and ensured that tasks critical to the implementation were accomplished. The managers planned the implementation and how the new process would align with current practices. Moreover, the managers reported performing some of the implementation tasks, such as testing, themselves. They arranged regular project meetings to make sure the project was progressing as planned and compiled practical instructions regarding the new process.

*“I made sure that the implementation tasks, such as testing, were completed.” (M2)*

*“I had to consider how we will get the new process to fit into the current practice.” (M1)*

Managers felt that their role was to advance the implementation. They reported feeling expectations to push for the implementation and do more than others. They controlled the eHealth implementation process and made sure that it was progressing and going forward. As they had a goal-oriented role in the implementation process, the managers reported setting goals and striving to achieve them.

*“The expectation is that you specifically strive for it.” (M4)*

*“I was always that person who oversaw that it progressed.” (M5)*

eHealth implementation also required managers to collaborate with stakeholders, such as system vendors and the project organisation, to ensure satisfactory progress in the implementation. By attending workshops arranged by the project organisation, they liaised with management from other facilities involved in the implementation. Collaboration involved other internal units, such as the public relations and marketing departments, as well as tasks such as facilitating multidisciplinary work, liaising with project managers from the project organisation, participating in various project groups, and liaising with the system vendor to perform implementation tasks (e.g., requirement analysis).

*“One department we collaborated with to progress this service was the communications department. We also collaborated with our own ICT-specialist as well as the system vendor who does our EHR system.” (M4)*

*“I gathered the stakeholders from a wider area, put a group together and then held meetings.” (M5)*

*“I did the requirements analysis together with the project organisation.” (M6)*

### **3.3 Managerial role**

The managerial roles required authority and a position in the chain of command. They involved activities such as making decisions and being accountable for the progress of eHealth implementation. More specifically, the managers reported that they had to know about the current status of the implementation, why the solution was being implemented, and what was the aim of the eHealth initiative. They also stated that it was important for them to understand how eHealth will affect their staff, what they do and how they work. The interviewed managers reported gaining this information by attending training sessions and meetings that would not normally concern them. Furthermore, the managers acknowledged that being present enabled them to get a better grasp of their employees' thoughts and concerns about the initiative, as well as identify potential problems going forward.

*“[We]Have to know what it means, and how it changes the employees' work... how it affects their job.” (M2)*

*“So that they know the issues that are going to cause questions and what may be the barriers to implementation.” (M8)*

Managers felt that they were responsible for controlling and organising the implementation. In addition, they acknowledged that they are also responsible for the performance of their unit during the implementation.

*“Someone had the main responsibility and that was me.” (M5)*

*“Senior management is expecting to see results faster.” (M8)*

Managers supervised that the progress of the intervention followed the plans. They evaluated the implementation by asking for data and statistics. If the newly implemented process was not being followed, they took steps to find the cause for this discrepancy.

*“Supervision... evaluation that it works and is done the way it was meant to be done.” (M9)*

Managerial roles also involved human resources management, e.g., recruitment, training and competency evaluation, and development. The managers reported that they evaluated staff members' strengths and allocated duties accordingly.

The managers also gave staff the chance to develop their competency. They were responsible for staffing the implementation and planning how they could organise the new process with certain resources. Managers allocated resources to enable training and even occasionally conducted the training of new staff members themselves.

*“Look at people’s strengths and place them so that they get to act on their strengths.” (M1)*

*“I’ve divided the work internally so that people have had the chance to learn.” (M6)*

### **3.4 Informational role**

Informational roles involved handling, sharing, and integrating key knowledge. Sharing information meant that managers passed on relevant information and made announcements to both internal and external stakeholders. In the internal environment, the managers reported acting in a way that ensured that the subject of eHealth innovation was actively talked about within their facility. Furthermore, they reported acting as a filter between staff members and the senior management by bringing a day-to-day perspective to strategic discussions. Managers review information, such as contracts, and pass it on to the right people. They also relay information from their facility to external stakeholders, acting as a link between the health care organisation and the project organisation. Managers also liaise with the system vendor and other primary care facilities.

*“I enabled the information flow between the project organisation and the primary care facility.” (M6)*

*“I pass on the encouragement, guidance, and focus from the senior management and take the feedback and experiences [of my staff] back to the senior management.” (M7)*

*“...the manager has a major role and they have to keep up the conversation and talk (about the implementation).” (M9)*

Managers integrate information by analysing data and relaying the most relevant findings to different stakeholders. It is plausible that they will report the same information to senior management as well as in a staff meeting, but they have to ensure that the way in which the information is delivered will be relevant to the audience. Managers are also in charge of documenting the implementation and providing staff, senior management and the project organisation with status reports. They may also translate the information depending on the audience.

*” ...in between I just have to translate it into the sort of language that is relevant to those doing the concrete tasks.” (M9)*

*“If the system developers come to me with ideas then I’m there to tell them which aspects seem practical and sensible considering the work.” (M10)*

## **4 Discussion**

This study contributes to the current knowledge on eHealth implementation by providing insight into how primary care middle managers engage in the implementation of eHealth initiatives. The principal finding from this study was that primary care middle managers perform tasks that fall under supporter, implementation advancer, managerial and informational roles during the implementation of eHealth initiatives.

The role that the managers interviewed in this study identified most with was the supporter, which consisted of inspiring staff and championing the implementation of an eHealth solution, among other tasks. Middle managers reported that they acted as supporters by having daily talks with staff, acting as a role-model, creating a positive implementation climate and by being available when needed. These findings are supported by what has been reported in earlier research (Kujala et al., 2019; Laukka et al., 2020; Urquhart et al., 2018; Varsi et al., 2015). According to Mintzberg’s theory (1973), the manager has to take on the role of a leader to motivate and encourage staff and align staff members’ needs with organisational goals. The middle manager role theory by Birken et al. (2012) also suggests that managers encourage employees to use innovations consistently and effectively. In contrast to our result that selling eHealth implementation was part of the supporter role, Birken et al. (2016) rated the selling role as least important to the implementation of innovations, while the informational role was considered the most important to implementation. This discrepancy may be explained by the type of innovation that was implemented, as our results are consistent with findings from other eHealth implementation studies. The research from Birken et al. (2016), on the other hand, concerns innovation implementation. For example, Laukka et al. (2020) and Varsi et al. (2015) reported that the supporter role is the most important for middle managers involved in eHealth implementation. Based on these observations, it may be possible that eHealth implementation requires more justification, selling and support than other innovation implementations (Laukka et al., 2020).

Managers in our study recognised the importance of confidence and competence in the support of eHealth implementation and, as such, did not report the lack of either. In contrast, Kujala et al. (2019) found that certain managers are not confident in supporting staff because they do not feel competent in using eHealth themselves.

It may be that the middle managers in the current study were the main proponents of eHealth initiatives in their facility, and therefore, possess fairly good eHealth competence and therefore may have been more confident advocating it.

The presented results revealed that middle managers feel that they had to be enthusiastic about eHealth and act as role models if they are to inspire their subordinates. Similarly, Birken et al. (2012) noted that middle managers have experienced how maintaining a positive attitude towards innovation implementation was crucial to eventual implementation. Middle managers who were accountable for the progress of implementation were more inclined to be committed to the implementation of an innovation than those who were not accountable for the process. All of the middle managers in our study – with the exception of one - were active participants in the project group and accountable to the project organisation. Therefore, they may have been more enthusiastic about eHealth implementation, as well as assigned it a higher priority, than middle managers who were less involved in the implementation process.

Our results suggest that middle managers had to be able to convince employees that eHealth innovations are worth their time and effort, as the implementation of eHealth solutions, especially the beginning, will most probably add to an employee's workload. The interviews revealed that a middle manager's enthusiasm was also crucial to justifying the eHealth implementation. This is supported by the theory by Birken et al. (2012), more specifically, selling an initiative suggests to employees that the innovation is worth the manager's time, which is then also expected to apply to employees. The interviews revealed that managers had to justify changing the process associated with eHealth implementation to the city council. Similarly, Urquhart et al. (2018) found that middle managers influence organisational policies related to the implementation of innovations by advocating the solution to senior management.

A comprehensive analysis of the emerging themes related to middle managers' roles suggested that these managers had to take on numerous roles, and the observed overlap among roles means that managers may exercise various roles simultaneously during eHealth implementation. Middle managers in our study performed implementation-related activities that are not usually part of a health care middle manager's work and tasks. This mirrors previous research, which found that health care managers must be competent not only in clinical health services and management, but also eHealth (Laukka et al., 2020). Birken et al. (2016) also found that middle managers engage in innovation implementation-related activities by performing tasks that frontline staff usually perform in the scope of implementation. Similarly, Mintzberg (1973) found that managers, due to their formal authority, represent the organisation as a liaison.

This liaison role is unique because the manager works not only vertically – relaying information between their superiors and staff members - but also horizontally to network with various stakeholders and link the organisation with its environment. The contacts they make as a liaison may be simply explained by the manager's formal title rather than proactive networking. A review by Ingebrigtsen et al. (2014) also stated that some health care leaders actively collaborate with IT professionals, and that this type of behaviour was linked with higher implementation success rates.

In our study, managers brought up the role of a decision-maker. Managers are usually regarded as decision-makers due to their organisational position; however, there are differences in the way they perform this role (Mintzberg, 1973). Based on our interviews, the middle managers acknowledged that they had to have current information from their employees to make decisions regarding the implementation. Hence, they attended meetings and training sessions not only to support their staff, but also to gain knowledge on what problems they should expect going forward. Managers felt that this behaviour is important for the excitement about eHealth, and will affect their implementation-related decision-making. For example, Urquhart et al. (2018) described how middle managers' decision-making regarding resource allocation can heavily influence eHealth implementation, i.e., they can allocate resources to the implementation process to advance progress or have the implementation demoted to low-priority work by assigning resources to other tasks. This example demonstrates the relationship between the supporter and decision-maker roles.

The managers' reports of working to allocate scarce resources means that they had to be competent in resource allocation in addition to confidently making key decisions. At the same time, they performed day-to-day tasks related to advancing the implementation. Furthermore, it should be noted that managers' decision-making in the scope of the eHealth implementation was not only linked to officially authorising the implementation, but also contributing to a sense of security among staff, i.e., relaying that the management stands behind the implementation. Hence, we noticed a degree of overlap between the identified middle management roles. This overlap between categories has been previously observed, as no role can be isolated from another (Mintzberg, 1973). In fact, Engle et al. (2017) suggest that a manager exerts the strongest influence on implementation when their various roles build on each other.

In our study, the middle managers felt responsible for the eHealth implementation and accountable to their staff, senior management and project organisation. This contrasted what was reported by Kujala et al. (2019); more specifically, an investigation into eHealth implementation at a university hospital revealed that all of the leaders were not aware of who was responsible for the eHealth implementation in their organisation.

The middle managers interviewed in the present study were all actively involved in the project, and therefore, may have felt more accountable. The conflicting findings may well be due to differences in the study settings, as primary care units tend to be smaller in size than university hospitals, which may mean that staff members have a clearer understanding of their responsibilities. Regarding responsibility for the implementation, the interviews revealed conflicting expectations between stakeholders, i.e., staff and management were ready to implement the solution but the project organisation had a delay in delivering the technical components. The interviewed managers noted that they had to manage strong expectations from both senior administration and staff members to demonstrate good progress in the implementation.

The interviewed managers supervised and evaluated the implementation to ensure that it was progressing as planned. Birken et al. (2016) also reported that middle managers evaluate, monitor and audit staff performance during innovation implementation. The managers in our study felt as though they were accountable for the evaluation. This is contrary to what was reported by Varsi et al. (2015), i.e., most of the follow-up was left to other operators, such as the project organisation. This resulted in a lack of formal evaluation in the implementation process, a feature which many of the managers would have preferred.

In our study, middle managers also described performing human resource activities, such as staff recruitment and training, along with evaluations of staff competence and development. Similar roles have been described in other studies, e.g., managers have been reported to arrange training sessions and coach their staff (Engle et al., 2017; Varsi et al., 2015). Managers are responsible for ensuring that their staff have the tools and competences to implement innovations (Birken et al., 2012). Mintzberg (1973) also theorised that managers act as resource allocators to make important decisions about organisational resources such as budget, time, material, staff and equipment.

The interviewed managers also described various activities related to the handling of information. Based on the interviews, it was clear that the managers not only act as an information channel between senior management and staff, but also link their own organisation, the project organisation and system vendors. Therefore, the informational role of middle managers can become highly complex in implementation projects that involve both health care and external organisations, as the middle managers – who serve as the interface between the stakeholders – must manage expectations from both organisations. Managers reported integrating information from various sources and translating information into a more relevant form based on who it was being presented to. This agrees with what was reported by Birken et al. (2012), i.e., middle management participates in information synthesis.

Middle managers integrate and interpret facts and provide specific information about the innovation to different stakeholders. In our study, we found the informational roles to be linked with managerial roles. In other words, the information channel role means that managers have amassed plenty of knowledge about the implementation process, whereas the managerial role means that they have the authority to make decisions based on their knowledge. Managers also served as an information channel between different stakeholders and made sure that eHealth implementation was a topic of conversation within the work community. This highlights how managers utilise the contacts they have made through collaboration to drive implementation. This supports the theory by Birken et al. (2012), i.e., middle managers disseminate facts regarding innovation implementation.

The results of this study may help optimise the implementation of eHealth initiatives in primary care; this is relevant as the current policies favour the development of integrated eHealth services at the national, and even international, level (European Commission, 2018). This research reiterates the importance of a clear understanding of middle managers' actual roles in eHealth implementations, as well as following how these roles are interconnected. An understanding of middle managers' roles in current implementation projects, and how these roles interact, precedes suggestions for implementation best practices. Hence, it would be useful to further study the different roles of middle managers, with an emphasis on the connections between these roles, in eHealth implementations. In other words, future research could focus on analysing which interactions between roles promote, as well as hinder, implementation success.

#### **4.1. Limitations**

This study had some limitations. First, the researchers' experience on this subject may have affected the sampling and interpretation of the results. On the other hand, a deep understanding of the study phenomenon may also have ensured the collection of rich, multi-faceted data. The results may not be transferable to other health care sectors and systems because middle managers' roles may differ widely between organisations due to differences in organisational structure, implementation climate and the type of eHealth measure being implemented. Nevertheless, the interviewees in this study represented primary care facilities which differed with respect to size, geographical location, and demographic characteristics of the patients being treated; this means that the results may well be transferable to other primary care facilities in Finland.

To increase the trustworthiness of the research, a pre-test interview was used to prepare for the actual interviews, i.e., enable the planning of more appropriate and detailed questions.



The authenticity of the research was increased by including a variety of citations and drawing parallels between previously reported original data and the current findings. The number of interviewees ensured that appropriate data saturation was reached. The sampling was also appropriate in light of the research question. Some interviewees participated more actively in the implementation than others, while the interviewees demonstrated varying degrees of responsibility for the advancement of an eHealth initiative. This may have been an important factor in the collection of rich data on middle managers' roles in eHealth implementation (Kygäs et al., 2020).

## **5 Conclusions**

The interviews analysed in this study indicate that primary care middle managers have complex roles in the eHealth implementation process, with the complexity of various interconnected roles particularly evident when the implementation is part of a nationwide scheme involving various primary care facilities and external organisations. Middle managers have a responsibility to not only the staff and senior management in their own facility, but also to the project organisation, system vendor and other primary care facilities within the scheme. A comprehensive analysis of the emerging themes related to middle managers' roles suggested that these managers have to take on numerous roles, and the observed overlap among roles means that managers may exercise various roles simultaneously during eHealth implementation. From a clinical practice standpoint, this study provides novel insight, yet primarily suggests that a thorough understanding of middle managers' roles in an eHealth implementation is needed. Specifically, primary care middle managers can use the presented findings to recognise the various roles necessary in eHealth implementation, as well as reflect upon which roles are most pivotal to the implementation process.

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**Table 1** An example of the content analysis process

Simplified expressions	Subcategory	Category	Main category
Try to make them excited about the project	Being interested	Inspiring	Supporter
Be enthusiastic about eHealth	Being enthusiastic		
Own interest is important to prioritising implementation	Showing an example		
Show an example that it is good to try different options	Taking part		
Leading by example	Being available		
Doing the telephone work with them			
Looking at the system together			
Attending certain meetings			
Being involved in the project group			
Employees can come and talk to me			
They could call me anytime			
Being present and listening			
Try to motivate everybody	Motivating	Encouraging	
Reminding frontline supervisors to advance the implementation	Reminding		
Encouraging the employees to try	Supporting		
Supporting the project work	Listen		
Management stands behind it	Engaging		
Easy to implement because I stand behind it	Committing		
Engage staff by asking them to create content			
Commit staff by asking for feedback			
Justify with experiences	Justifying	Championing	
Tell the employees that we need this	Making understand		
Make employees understand that we need eHealth	Selling		
Selling that this is the norm	Marketing		
Marketing eHealth to the staff	Advocating		
You must be convincing and believable	Convincing		
Sell eHealth to the work community			
Try to make employees understand what the policy will mean in practice			
Selling eHealth to staff as a possibility			
Advocating eHealth			

**Figure 1** Primary care middle managers' experiences of their roles in eHealth implementation.

