# Swedish District Nurses' Attitudes to Implement Information and Communication Technology in Home Nursing

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**Abstract:** The use of information and communication technology has increased in the society, and can be useful in nursing care. The aim of this study was to describe district nurses' attitudes regarding the implementation of information and communication technology in home nursing. The first and third authors performed five focus group discussions with 19 district nurses' from five primary healthcare centres in northern Sweden. During the focus group discussions, the following topics were discussed: the current and future use of information and communication technology in home nursing; expectations, advantages, disadvantages and hindrances in the use of information and communication technology in home nursing; and the use of information and communication technology from an ethical perspective. The transcribed focus group discussions were analysed using qualitative content analysis. The results showed that district nurses' attitudes were positive regarding the use of information and communication technology in their work. They also asked for possibilities to influence the design and its introduction. However, the use of information and communication technology in home nursing can be described as a complement to communication that could not replace human physical encounters. Improvements and risks, as well as the importance of physical presence in home nursing were considered vital. The results revealed that the use of information and communication technology requires changes in the district nurses' work situation.

**Keywords:** District nursing, focus groups, information and communication technology (ICT), attitudes, qualitative content analysis.

## INTRODUCTION

This study is a part of a research project in Swedish primary healthcare, regarding implementation of information and communication technology (ICT) to increase the accessibility of care for chronically ill people living at home. The knowledge gained through this study can be used for planning further research where ICT will be used as a tool for supporting people with serious chronic illness living at home.

In the last few years, time spent in hospital care has decreased resulting in that people with illness have been discharged from hospitals earlier and sicker, than previously been reported [1]. For this reason, it has become a challenge to find new ways to support people with serious chronic illness living at home. One way to achieve this may be through suitable applications of ICT, which offers possibilities for people to communicate, gather information, and interact with distance services faster, easier, and without limitations of time and space [2]. According to the National Strategy for e-Health [3], ICT could enable caregivers and healthcare decision-makers to improve care for patients. Koch [4] stated that research concerning home telehealth for improved accessibility and communication for health professionals and their patients are rather few. Therefore, research is important to determine impacts, benefits, and limitations in developing feasible solutions for home telehealth. According to a review study [5] describing the use of teleconsulting applications, the most frequent teleconsultings were between doctors in real time, and the most infrequent one was between the nurse and patient. The rapid growth of technical and scientific knowledge in society has also generated many changes in health and nursing care. However, nurses have always used tools and technology for achieving valued outcomes in their work [6, 7]. Nurses are exposed both to complex and sophisticated technologies in their work, such as heart-lung machines, as well as to simpler technologies like the thermometer [8].

District nurses (DNs) have the responsibility of supporting people with chronic illness living at home [9, 10]. The work as a DN in Sweden includes caring for people of different ages, and one priority is to support seriously ill people and their relatives [10]. To create a close relationship in nursing care, communication and mutual relationship is essential [11-13], and part of the DN's role is to develop a trusting relationship with the patient [14].

Communication skills in nursing care could be inhibited by environmental social barriers, as well as structural or cultural aspects of healthcare [15]. According to Häggman-Laitila and Åstedt-Kurki [16] and McCabe [17], an important factor is to use a patient-centred communication to achieve quality and a positive relationship in nursing care. To enable DNs to improve their support for people with chronic illness living at home, suitable tools are needed, and methods and knowledge should be developed. The use of ICT can, therefore, be viewed as a part of the DNs' work. Previous research [18] has shown that the key themes in the use of ICT are "user-friendliness" and clinical appropriateness. Therefore, the aim of this study was to describe DNs'

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attitudes regarding the implementation of ICT in home nursing.

## METHODS

A qualitative approach was used to obtain an increased understanding of DNs' attitudes to use ICT in their work. Furthermore, the qualitative approaches provided insights from the participants' perspective [19]. Data were collected through focus group discussions and analysed by content analysis.

### Participants and Procedure

This study comprised a purposive sample of 19 female DNs. The inclusion criteria were that the participants must be registered nurses with a DN graduate diploma, and must be working as a DN. The participants' age ranged from 30 to 64 years (md = 47), and their work experience as DNs ranged from 1 to 23 years (md = 5). They worked at five primary healthcare centres in two municipalities in northern Sweden. Eleven participants worked in daytime shifts, while eight worked in the evenings.

The DNs were selected with the assistance from the heads of five primary healthcare centres. Information was given about the nature of the study, and participation was voluntary with the possibility of withdrawing at any time. Information letters were distributed to the heads, who informed the DNs, and the heads distributed the letters to the DNs. The DNs were assured of confidentiality and anonymous presentation of the results. The Regional Ethical Review Board in Umeå, Sweden (05-059M) approved the study.

### Data Collection and Analysis

Data were collected from May 2005 to March 2006 through focus group discussions to describe DNs' attitudes regarding the implementation of ICT in home nursing for people with serious chronic illness living at home. According to Morgan [20] focus group discussions is a method that can explore new research areas and is well suited for obtaining research information from the participants' perspective. Through the interaction of the group, data will arise according to the specific topic being discussed [21]. In this study, four focus groups with four DNs and one group with three DNs were included.

During data collection, the first and third authors were represented as moderators. The first author's role was to lead the discussion and create a non-threatening supportive environment that encourages all the participants to share their views, i.e., facilitating interactions among the participants and interjecting probing comments and transitional questions [20]. Before commencing the focus group discussions, the participants were instructed not to talk about the contents of the discussion to others outside the group. The first author started the focus group discussion with an introduction to the aim of the study and the different topics that should be discussed: the current and future use of ICT in home nursing; expectations, advantages, disadvantages and hindrances in the use of ICT in home nursing; and the use of ICT from an ethical perspective.

To stimulate the discussions among the participants, two examples of ICT applications were presented and explained. The first example described a field case used in home visits that included different equipment, such as laptop with access to the computerised case-record system, digital camera, web camera, mobile phone, bladder scan, and electrocardiograph with the possibility to send test results to physicians. The second example defined an ICT application with text messages used for communications between people with serious chronic illness living at home and their DNs [22]. The discussions started with the question, "Tell me about your views on using different types of technology in your work as DN". Two of the focus group discussions were carried out in the participants' workplace, and three in a university department. Each focus group discussion lasted for about 90 min, and was audio taped and later transcribed verbatim.

The transcribed focus group discussions were analysed using a qualitative content analysis. The goal of this analysis method was to provide knowledge and understanding of the phenomena under study [23]. The interview texts were read several times to gain a sense of the content [24]. Bearing in mind the aim of the study, textual units were identified, condensed, and coded. The textual units with similar content were sorted into areas, and consequently, the areas were sorted into categories in several steps. During the whole process, the researchers occasionally went back to the original textual units and compared the results.

## RESULTS

The analysis resulted in three categories: (1) possibilities to influence the design and be a part of the introduction; (2) improvements and risks; and (3) people cannot be replaced by technology. The categories are presented below and illustrated by quotations from the DNs.

### Possibilities to Influence the Design and be a Part of the Introduction

The DNs pointed out the significance of being a part of the development of new technology to influence the design. This was a prerequisite for using ICT in their work and they pointed out the importance of ICT being simple, user-friendly, and suitable. In their experience, some technical equipment were too advanced, unnecessary, or unsuitable for their use in nursing care. The DNs indicated that some technical equipment were designed by people who were unfamiliar with the DNs' work, as was discussed in the following citation:

…it should be easy to use and less moment. (DN 17) Yes (DN 19) …I think that the one who work with it, should design it, now it has been the IT-personnel…it must be the personnel who work with it, who develop the technique... (DN 18).

The DNs described the importance of being a part of the introduction of ICT in nursing care. They asserted that instructions on how to use the technology and who would have access to the technology must be clear from the beginning, because they had earlier experienced how difficult it was not to have been a part of the introduction. They also pointed out that information and education were necessary, since from their experience they found that technologies often lacked instructions. They remembered when the case records were computerised a few years ago, and this experience gave them a negative perception of the new technology from the begin-

ning. However, as they observed the benefits of the computerised case-record system, the DNs now had a better understanding of what these technologies demanded from them as users. One DN described:

…this must be solved first otherwise it's no idea that we go there with an equipment …it's no idea to take a test if I am not able to do something about it… (DN 9).

Based on the DNs' experiences, learning, and using the technology was an individual task. They also pointed out that the use of technology in nursing care for the ill person must be voluntary. The DNs said that those who are ill should be a part of the introduction and that they, together with the DNs, should have time to practise using the technology. The following citation illustrates the dialogue between the DNs:

...important is that you really get the time you need [for practice], otherwise it could be wrong and you don't have the strength to do the job you have to do. (DN 18) Yes, so be part of it. (DN 19).

**Improvements and Risks**

From the DNs' experience, new technology such as the computerised case records improved the nursing care. They mentioned that the computerised case records in the laptop enabled them to give and receive information independently, irrespective of where they are. They believed that it was a safer system. The DNs thought that ICT could improve their work. They referred to the ill person's case record from a laptop in the person's own home that made it possible to give information, prescriptions, or getting information when the ill person visited the primary healthcare centre.

By using ICT in communicating with the ill person at home, the DNs stated that the use of ICT could decrease stress because of decreased travelling time and home visits. The DNs also observed that the technology was time saving. They affirmed that ICT could improve accessibility and security for ill people staying at home, especially for those living in thinly populated areas or for those who refuse to visit hospitals or primary healthcare centres. Two DNs stated the following:

With that [the technology] you can give answers at once if they, for example, will know how the test I took a week ago. I can answer at once and don't have to return to the primary health care centre and call back. (DN 9) ...this reduce the stress factor of going back and look into the case records and read the record and search for results...instead I can read the case record here in the patient's home… (DN 10).

The DNs in another focus group also discussed the same topic:

I think it can be received safely if a patient, in an easy way, can be in contact with the DN at any time. (DN 4) …to use ICT is an alternative to drive far away to a patient and you will avoid risky drives in the dark and slipperiness… (DN 1).

On the other hand, the DNs pointed out that the use of ICT at home could bring difficulties and uncertainties. Some of these difficulties could be in retaining a holistic perspective on nursing care, and in obtaining important information from the ill person. The DNs also expressed an uncertainty about handling the equipment, which could be stressful. They also described the possibility that the use of ICT could be frightening, especially for older people. They mentioned that promoting the use of ICT in nursing care could take time, because of problems in the installation and management of the technology in the ill persons' own home.

**People Cannot be Replaced by Technology**

The DNs expressed anxiety about not being needed in the future, because information would be available online. They viewed the use of ICT rather as a complement to facilitate nursing care. Before using ICT for communicating, the DNs stressed that it is important to get to know the ill person first. They pointed out how important physical encounters are in building up a trusting relationship with the ill people staying at home. If the appropriate information given and the relationship with the ill person were satisfactory, the DNs considered that there would be no disadvantage in using ICT in their work. They indicated that the use of ICT would not be suitable for everybody, and home visits are valuable in terms of revealing so much more information about the ill person.

The DNs further expressed that the technical equipment could encroach in the ill person's own home as well as on other family members. They discussed on how the autonomy of the ill person and the family would be threatened if anyone in the family did not want the equipment. The DNs pointed out the importance of being observant about how the technology was used, and in making sure that it did not hurt anybody. They discussed that in the future, the use of ICT in nursing care would increase, which would require changes in their work situation:

ICT can never replace the personal contact...someone can experience that nobody notice them. (DN 15). You cannot replace the human contact with the person, because it's also another language that you have when you meet a person in real because sometimes you feel in the atmosphere that even if not the words say anything you can understand that here it's not right. You must take it [ICT] as a complement I think that it cannot replace the human being. (DN 18)

## DISCUSSION

The results show how important it is for the DNs to have the opportunity to influence the design and implementation of ICT in home nursing. The DNs regarded that the implementation of ICT in their work would comprise both improvements and risks. They stressed that technology cannot replace people, instead technology can be seen as a complement in supporting people living at home with serious chronic illness.

This study demonstrates that DNs want to be a part of the development of new technology to influence the design. Implementation of new technology should be based on satisfaction of the individual. Satisfaction should come from human needs and the person's rights, such as the right to integrity and the right to equality [25]. Participation in the introduction of ICT in nursing care includes getting necessary information and training. Starren *et al.* [26] demonstrated that participation in the introduction of ICT is of importance at the beginning of the process. In this study, the DNs pointed out the importance of taking part in the introduction and routines of using ICT in their work. This indi-

cates that the organisation wherein the ICT equipment will be used must be prepared before its introduction. Collste [25] argued that an analysis of the consequences of implementing new technologies should be based on and compared with alternatives, and thereby provide solutions for those who are involved. Furthermore, a strategy for educating personnel on the use of ICT should be addressed [27].

The DNs believed that ICT could improve security for ill people living at home, and at the same time, improve their own work situation. They realised the possibility that ICT applications could save time owing to decreased travelling time and fewer home visits. This is in line with several studies that demonstrated that the use of technology in healthcare could save time [28-30]. The results further reveal that the use of ICT could demand time, such as during the process of connecting ICT equipment in homes. The use of technology in surgical nursing affects nurses negatively when the technology makes their daily practice of nursing care more demanding, more time-consuming, and distracting [31].

In this study, the DNs stressed that the use of ICT could not be suitable for all people and noted that home visits revealed much more. The DNs asserted that ICT cannot replace people, and physical and human presence is still important. This is in line with the observation by Söderlund [32] who examined the use of ICT as a support tool for older people with severe disabilities in need of help when living at home. To satisfy their needs, practical help and physical encounters were essential. Sävenstedt, Sandman, and Zingmark [33] stated that ICT could promote human care, but ICT could also lead to dehumanised care.

The DNs pointed out the importance of physical encounters in home nursing to build a trustful relationship. Mok and Chiu [34] stressed the importance of a trustful relationship and that nurses meet the demands both of themselves, and of those who are ill and their families. If ICT replaced physical encounters, the quality of care could be questioned [35]. The DNs stated the importance of getting to know the ill person before starting to communicate through ICT. Knowing the patient is an important part of nursing care; it signifies understanding the patients' needs and creating interventions for the person [36, 37]. Hence, getting to know each other seemed to be important for both the ill person and the health professional to build a trustful relationship [38].

The results showed that ICT could be a complement in nursing care. The DNs pointed out that if ICT should be a part of their work, then it would result in certain changes. According to Aas [39], aspects of these changes can include less travelling, more time for other work, new contacts, and increased sense of professional security and satisfaction of seeing partners in communication. Heinzelmann, Lugn, and Kvedar [40] concluded that the integration of ICT within the healthcare will offer ill people and their providers many possibilities in the future.

### Methodological Considerations

The strength of this study was the use of focus group discussions to optimise the understanding of the complexities of the research questions. The discussions encouraged the DNs to express their points of view related to their experiences on the use of ICT. The moderator tried to avoid steering the discussion, and instead, allowed the DNs to discuss as freely as possible. To retain the focus of the discussion, an interview guide was used. The results showed that the focus group discussions ended up with agreement in almost all the questions discussed. To reach trustworthiness in the study, the findings were discussed with other researchers and colleagues.

The limitation of the study was mainly with the sampling issue. The number of available participants was limited and the number of focus groups was therefore few. The groups consisted only of DNs working in the same county council, which means that the sample is not representative of all DNs. However, the findings of this study cannot be generalised, as this is not the goal of qualitative research. Instead, the findings can be transferred to similar situations by modifying them to comply with the context [19].

## CONCLUSION

The results in this study indicate that DNs attitudes were positive to the use of ICT in their work. They questioned on the possibilities of influencing the design and introduction of ICT. Using ICT in nursing care was described as a complement for communication and was not seen as a replacement for physical encounters. To promote the quality of nursing care ICT could be one of the tools, however, this area is sparsely studied. This study indicates that the use of ICT could be a facilitator in the DNs' daily work.

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