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Nurses' experience with telecare: a qualitative analysis of perceptions and implications for caring and the nursing profession

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Abstract

Background In Italy, telecare has experienced significant growth in recent years, especially following the COVID-19 pandemic. This modality helps overcome geographic and time barriers, proving to be a valuable tool for ensuring access to care and improving the quality of life for patients. However, implementing telecare requires several challenges for nurses such as difficulty to adapt to a remote relationship, lack of training and adequate technological resources, and concerns about data security and privacy. The aim of the study is to explore nurses' experience with telecare and their perceptions about its positive and negative implications for caring and the profession.

Methods A qualitative study with semi-structured interviews was carried out by involving ten nurses working with telecare service from the Local Health Authority of a city in a central-Italy region.

Results Four main themes emerged: (1) the benefits of telecare, (2) the disadvantages of telecare, (3) opportunities for professional growth, and (4) challenges in telecare.

Conclusions The results of this study suggest that effective implementation of telecare should take into account not only its potential benefits for patients and nurses but also the challenges related to the nurse-patient relationship and technological barriers. To improve healthcare it is important to invest in training, develop accessible technologies, share patient data and integrate telecare into traditional care models, in order to foster an holistic and individualized approach.

Clinical trial number Not applicable.

Keywords Telecare, Nurses, Caring, Patients, Qualitative study

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Background

In Italy, the landscape of healthcare is undergoing an important transformation with the increasing adoption of telehealth system. Telehealth is defined as the delivery of healthcare service at a distance through the use of information and communication technologies (ICT) [1]. Telehealth system can be an innovative opportunity for health prevention and promotion, treatment, and patient monitoring, as well as for facilitating multidisciplinary collaboration on clinical cases. The areas in which telehealth is applied are diverse and, depending on the area, take on different names. In the specific field of nursing, it is called telecare. Therefore, telecare can be considered within the overall concept of telehealth to visualize the role of the nurse in the use of ICT [2]. The telecare service has experienced significant growth in recent years, especially following the COVID-19 pandemic. This modality helps overcome geographic and time barriers, proving to be a valuable tool for ensuring access to care and improving the quality of life for patients with mobility difficulties or living in remote areas [1]. The purpose of telecare is to guarantee continuity of care by ensuring that patients receive the care and support they need, even at a distance. Telecare interventions include programs run by nurses who regularly contact patients by telephone to transfer knowledge and skills for self-managing chronic conditions at home. In this sense, the service enables the empowerment of patients, giving them a more active role in managing their own health [1]. Such a service have been shown to improve the quality of life and self-care abilities of patients with chronic diseases [3]. Telecare is used for various purposes including monitoring relevant diseases. In this area, telecare has been beneficial for several chronic conditions such as cardiovascular, respiratory, autoimmune, endocrinological, metabolic, and oncological diseases [4, 5]. Computerized monitoring systems allow monitoring of vital parameters (e.g., blood pressure, heart rate, saturation, body weight, blood glucose) to prevent complications in at-risk patients [4]. A typical field of application of this remote patient management modality is cardiology, particularly with regard to conditions such as arrhythmias, chronic heart failure and hypertension [1, 6]. For example, telecare technologies often enable the remote transmission and monitoring of data from implantable systems such as pace-makers [7]. Such device allows the detection of symptoms and abnormal parameters before the patient undergoes an emergency or routine visit, enabling corrective measures to be taken before serious complications appear. Telecare interventions showed positive effects on health outcomes, patients' quality of life and in reducing healthcare costs [8–11]. This technology helps to manage excess demand and overcome difficulties related to geographical distances and transport problems [12, 13]. A qualitative

study of nurses highlighted several benefits of telecare for the healthcare system, including cost savings, reduced care burden and improved access to services [14]. Some nurses see telecare as a way to reduce hospital admissions and improve treatment adherence. They also see it as a valuable tool for improving communication between nurses and patients, promoting emotional support and health education [14].

However, the integration of these technologies introduces complexities associated with the nurse-patient relationship that intersect with the fundamental principles of Watson's caring theory [15]. Watson emphasizes the centrality of care as a human-to-human process, highlighting the importance of empathy, compassion and the establishment of a trusting relationship between nurse and patient. Telecare, while offering convenience and efficiency, requires careful consideration of how the principles of caring can be maintained when mediated by technology. The use of the technology interface could hinder the development of a care process involving patients actively, potentially and compromise nurses' ability to intercept and respond to the holistic needs of patients. Recent literature highlights that nurses report several challenges in the implementation of telecare including the difficulty for professionals and patients to adapt to a remote relationship, concerns about data security and privacy, lack of adequate technological resources, and poor training in the use of technology [14]. The adoption of telecare requires nurses to develop new skills and competencies that relate to Benner's novice-to-expert theory [16]. Benner identifies five stages of skill acquisition from novice to expert, highlighting the importance of experience and continuous learning in professional development. The use of telecare requires nurses to acquire competence in new technologies, adapt communication techniques for remote interaction and develop skills in remote patient assessment and monitoring. In this sense, nurses need for training and support to effectively integrate telecare into their practice while maintaining a high standard of care. Finally, research suggests that while telecare contributes to improved patient quality of life through continuous monitoring and increased therapeutic adherence, technology may limit equity in access to care because not all patients have a stable internet connection or adequate devices to take advantage of the service [9].

In Italy, telecare is recently regulated through the State-Regions agreement of 2020 and subsequently through Ministerial Decree No. 77 of 2022, which defined the standards for the development of territorial healthcare in the National Health Service. In this sense, telecare service is recent and there are no studies on nurses' experiences and perceived usefulness in this context. Therefore, the aim of the study is to explore nurses' experience with

telecare and their perceptions about its positive and negative implications for caring and the nursing profession.

Methods

Study design

This study employed a descriptive qualitative design to explore in depth the experiences and perceptions of nurses regarding telecare. We adhered to the Standards for Reporting Qualitative Research (SRQR) guidelines [17] to ensure comprehensive and transparent reporting of the methods and findings.

Study context

The study was carried out within the Local Health Authority of a city in a central-Italy region, which implemented a telecare service for the taking care of heart failure patients. The aim of the service is to reduce re-hospitalizations and inappropriate emergency service use. Through a dedicated platform, patients can autonomously monitor their vital parameters at home and transmit the data in real time to an operations center. This allows healthcare professionals to closely track patient's clinical evolution and intervene promptly when necessary. Patients receive a customized home kit, including medical devices and a smartphone app to facilitate data collection and transmission. Healthcare professionals are provided with tools to visualize and analyze data, and they receive alerts in the event of any anomalies.

Participants and procedure

The participants were nurses with experience in telecare. Inclusion criteria were being a registered nurse and having at least 6 months of experience using telecare with heart failure patients. Participants were recruited through the telecare service manager, who informed eligible nurses about the study and facilitated contact with the researchers. Eligible participants were first contacted by a member of the research team, who explained the study's purpose and procedures, while ensuring anonymity in the processing of personal data. Nurses who agreed to participate were then recruited by a collaborator from an agency with experience in interviews and focus groups, to conduct the individual interviews. Data collection occurred in October 2023. Sampling continued

until data saturation was reached. The interviews, which averaged 30 min in length, were conducted by telephone. All interviews were audio-recorded and then transcribed verbatim to ensure accuracy. Transcripts were anonymized by assigning each participant a unique identification code to protect their confidentiality.

Ethical consideration

The study is part of a project funded by a local institution of the region and received approval from the local Ethics Committee of the University of Cagliari (Prot. no. 0077639 of 03/13/2024). The study complies with the ethical principles of the Helsinki Declaration (World Medical Association, 2013) and the ethical guidelines (Sect. 8) of the American Psychological Association (2020). Participation was voluntary and anonymous based on Italian privacy law (e.g., Decree n. 196/2003) and nurses were informed that they could leave the study at any time without any repercussions. Verbal informed consent to participate in the study was obtained from the participants prior to starting the interview.

Instrument

An interview guide (Table 1) was used to conduct semi-structured interviews. It explored the nurses' experiences with telecare, including the nurses' and patients' competence with technology, the perceived opportunities for professional development, and work changes as a result of its use. The interview questions were used flexibly to ensure the natural flow of conversation. During the interviews, stimulus-questions such as 'why?', 'can you explain further?' or 'can you give an example?' were used to clarify or obtain further details.

Data analysis

Thematic analysis was conducted following the general principles by Braun and Clarke [18]. First, each researcher independently read the interview transcripts to become familiarized with the data. Secondly, the researchers independently performed an initial coding of the transcripts, identifying key statements and concepts relevant to the research aim. We used a combination of inductive and deductive coding. The interview guide was used to identify initial codes, but new codes were created during the analysis to capture the nuances of the data. After the individual analysis, the research team convened to collaboratively analyze the initial codes. Through collective discussion, codes were grouped to form broader themes. This process was iterative and themes were refined as researchers returned to the transcripts to ensure they accurately reflected the participants' experiences. Shared main themes emerged. Themes were reviewed to ensure clarity and coherence, and each theme was clearly defined and named. Finally, the results

Table 1 Interview guide

1. How has the nurse's job changed with technology?
2. How do you perceive the role of technology in the relationship with the patient?
3. What are the main difficulties you face in delivering healthcare using technology?
4. What is the skill level of your patients in handling technology (what difficulties, training)?
5. What is your perception regarding the impact of technology for the development of your profession (opportunity, challenge)?

Table 2 Main themes and subthemes related to Telecare

Theme	Subtheme	Nurse	Quote example
1. Benefits of telecare	1.1 Reducing time and distance	N1, N2, N9	<i>"Telecare allows you to manage a greater number of patients (...), it allows you to do more frequent and faster monitoring, because the patient does not have to come to the outpatient clinic every time"</i>
	1.2 Improved management of hospitalizations	N2, N3, N4, N7, N10	<i>"(...) many patients, go to emergency department for issues that are easily solved through a video call (...). This, in my opinion, also would improve the activity, because we don't crowd the emergency departments (...)."</i>
2. Disadvantages of telecare	2.1 Concern about the nurse-patient relationship	N1, N8	<i>"there is a risk of preserving little of the relationship with the patient, which still requires face-to-face knowledge, a relationship cultivated through sustained, in-person interactions, not limited to brief tele-visits. (...)."</i>
	2.2 Technological barriers	N5, N6, N7, N8	<i>"(...) it really depends on the age as well... the person at home should have a family member who understands about technology and can connect (...)"</i>
3. Opportunities for professional growth		N2, N5, N8, N9	<i>"Telecare would allow us to be more active, more autonomous, because we are going to manage the patient from the hospital to home. We are the ones who decide the care pathway (...)."</i>
4. Challenges in telecare	4.1 Lack of time and resistance to change	N1, N2, N4	<i>"The difficulty lies in putting even this activity (...) in the middle of all the things we have to do, because in my opinion it takes dedicated time."</i>
	4.2 Continuing and specific training	N1, N9	<i>"(...) Continuing education as far as technology is concerned (...), you cannot stop at the knowledge that you already have but it has to be something that goes up."</i>
	4.3 Lack of human resources	N7, N8	<i>"(...) the main problem is the shortage of staff (...). You need people to work on it both in the morning and in the afternoon (...), because if we enroll so many patients, to check them all takes time and resources."</i>

were written by providing illustrative quotes that exemplified each theme. This collaborative approach allowed themes to emerge from intense group discussions, thus overcoming individual interpretations and minimizing individual researcher bias.

To ensure the reliability of the results, emphasis was placed on the self-reflexivity of the researchers. Although none of the team members had prior experience with telecare, which reduce the potential influence of previous experience on data interpretation, the team actively engaged in open discussions in all the phases of the research to mitigate bias. Additionally, to enhance self-reflexivity, the researchers took into account and discussed the field notes, which contain the interviewer's reflections during the interviews.

Results

Characteristics of the sample

The study included ten nurses, with an equal representation of males and females. Their ages ranged from 29 to 57 years, with a mean professional experience of 18 years (ranging from 3 to 35 years). The nurses had a mean experience in telecare services of 4 years, ranging from 1 to 10 years.

Nurses' perceptions and experiences with telecare

Four main themes emerged from the interviews, each with related subthemes. Specifically, nurses emphasized (1) the benefits of telecare (divided into 2 subthemes), (2) the disadvantages of telecare (which includes 2 subthemes), (3) opportunities for professional growth, and (4) challenges in telecare (which includes 3 subthemes).

Table 2 presents a summary of these themes and subthemes, and the reference to the nurses from whom the themes emerged.

Theme 1. Benefits of Telecare

Subtheme 1.1 reducing time and distance

With the introduction of technology, it has been possible to expand access to care, reaching even the frailest patients or those residing in geographically distant areas. Interviewees told about how this new model of health-care has helped to improve accessibility to care and the taking care of more people even from hospital, as Nurse 2 states.

With technology, we are able to reach out to more patients (...) that before we could not control, so, they were patients that were lost over the years.... (...) This way we can keep up with everybody, and everybody knows that they are being monitored by the hospital as well. (N2)

The testimonies of nurses 1 and 9 reiterate the concept expressed above and emphasize telecare potentiality to increase organizational work efficiency and quality of care. Nurse 1 explains that telecare optimizes resources and reduces waiting times due to the possibility of remote visits and monitoring, facilitates more frequent check-ups without the patient having to physically go to the clinic:

Telecare allows you to manage a greater number of patients (...), it allows you to do more frequent and

faster monitoring, because the patient does not have to come to the outpatient clinic every time (...). (N1)

Nurse 9 explains that the ability to perform checkups without having to move is an advantage for patients. In addition, by being able to monitor the patient remotely over time, a more complete picture of the patient's clinical condition can be obtained, so that timely action can be taken if needed.

The reduction of time spent monitoring the patient (...), having remote telecare you are able, over time, to get a more complete picture of the patient's situation. (N9)

Subtheme 1.2 improved management of hospitalizations

Nurse 2 explains that telecare is useful for managing all those chronic patients whose issues could be easily solved via telephone or video call consultation. This, according to the interviewee, would improve the efficiency of the healthcare system by not overcrowding the emergency departments.

(...) many patients, go to emergency department for issues that are easily solved through a video call or a call. And this, in my opinion, also would improve the activity, because we don't crowd the emergency departments (...). (N2)

Nurse 3's testimony focuses on the usefulness of telecare in managing chronic heart failure patients. He/she emphasizes that remote monitoring can allow medication therapy to be adjusted and avoid unnecessary hospitalizations.

In the patient with cardiac decompensation, [telecare] is useful for medication monitoring (...), to modify therapy (...). Doing telephone monitoring (...) would avoid so many hospitalizations for the patient. (N3)

Nurse 4 explains the crucial role of telecare in addressing the increase in hospitalizations by gathering information on symptomatology remotely, helping to decide whether the patient needs hospitalization or can be safely managed at home.

Technology has helped us (...) deal with the increase in hospitalizations (...), because by seeing patients, referring to the symptomatology, you get an overall picture of the patient and you can figure out whether or not he/she need hospitalization (...). (N4)

The decrease in hospitalizations was also emphasized by Nurse 10, but his/her testimony adds the importance of telecare in identifying more complex care needs. In fact, the interviewee points out that patients often go to the emergency department for psychological reasons rather than physical health problems.

(...) we have quantitatively reduced the number of patients who come to the hospital (...), in the hospital now only those who have needs come (...), many times patients came here not because they were not well from the cardiological point of view but from the psychological point of view. (N10)

Nurse 7 explains that telecare helps reducing access to the hospital due to a better managing the patient in the early stages of the disease, by offering more personalized support, giving the patients the information they need to understand their disease and handle themselves to prevent complications.

(...) patients particularly at the time of diagnosis, they have to be able to manage it in the best possible way (...), we can give them information, explain to them how they should behave in some cases. (...). So to avoid inappropriate hospital admissions due to mismanagement of the condition is very important. (N7)

Theme 2. Disadvantages of Telecare

Subtheme 2.1 concern about the nurse-patient relationship

Among the concerns of professionals as disadvantages of telecare is the potential loss of the human dimension of care and direct contact between patient and nurse. Specifically, Nurse 1 expresses concern that an over-reliance on telecare may compromise the quality of the relationship with the patient, which requires direct and continuous contact over time even in the presence.

(...) There is a risk of preserving little of the relationship with the patient, which still requires face-to-face knowledge, a relationship cultivated through sustained, in-person interactions, not limited to brief tele-visits (...). (N1)

Nurse 8 stresses this point, noting that technological intermediation may create an emotional distance between patient and nurse, thus limiting the ability to express emotions and increasing the risk of de-personalization of care.

(...) there is a detachment of the patient, because when we put in the middle, between us and the user, an interface, surely the relationship cools down,

detachment increases (...) surely the empathic aspect, the human involvement decrease... (N8)

Subtheme 2.2 technological barriers

While acknowledging the benefits, nurses also expressed concerns about technological challenges. The testimonies of nurses 5, 6, and 7 emphasize a key issue involving digital divide, with some patients, particularly the elderly, facing difficulties in using telecare technologies. This often necessitated family support to facilitate access and ensuring the service, as tell Nurses 5 and 6.

(...) it really depends on the age as well... the person at home should have a family member who understands about technology and can connect (...) (N5)

(...)there still has to be an intermediary who (...) explains all the steps well, or we give the information to the relative who then later on makes the patient understand what to do. (N6)

Nurse 7 reinforces the concept related to seniority and any cognitive limitations associated with aging and points out that some platforms are complex to use, especially for less experienced users.

(...) we have seen difficulties of patients depending on the platform used, there are simpler platforms (...), then sometimes we have difficulties to make them [patients] understand how they have to manage the pc even if it is only necessary to connect it to the power (...). (N7)

Nurse 8 raises a crucial point about the difficulty of ensuring telecare service in mountainous areas, where most users come from. His/her testimony focuses an important contradiction: while users in these areas could benefit more from the service to overcome distances and ensure care, they often face obstacles related to the scarcity of technological infrastructure. This could create new inequalities in healthcare access.

(...) ours is an area that also includes many mountainous locations, we could benefit the most from the technology but are poorly supported by the network (...), the patients who could have taken more advantages from the technology had disadvantages from the point of view of reaching the technology itself. (N8)

Theme 3. Opportunities for professional growth

Interestingly, despite the concerns about the nurse-patient relationship, telecare was also seen as an opportunity for professional growth. Nurses reported feeling

more autonomous and having greater decision-making power when managing patients remotely. This would provide a complete view of the patient's journey, from initial intake to ongoing monitoring over time. Particularly, Nurse 9 envisages a new role as 'telehealth nurse', requiring specialized technological and patient management skills, with the possibility of further development towards competence or expertise in the field of telecare.

(...) one figure that can arise is that of telecare nurse, which to date is recognized only in words, so it could arise as a specialized figure, dedicated only to that, so as to have 360-degree control of the patient, from taking care to continuous monitoring of the patient. (N9)

Also Nurse 2 expresses positivity about the impact of telecare on the nursing profession. Such a service would allow to strengthen the nurse function within the health care system, thus enhancing their active and decision-making role in the patient's care pathway.

(...) Telecare would allow us to be more active, more autonomous, because we are going to manage the patient from the hospital to home. We are the ones who decide the care pathway and everything is the best choice for the patient. It would make the profession even more autonomous and respected. (N2)

Nurse 5's testimony emphasizes the possibility through telecare to have an ongoing relationship with the patient, something that is often lacking in other care settings and that can be an element of growth.

(...) if I have Mrs. Rosa all the time, only me, I can call her, I can see if Mrs. Rosa is getting better or worse (...). (N5)

Nurse 8 suggests that telecare could also be implemented in other care settings such as end-of-life care, thus allowing for a further extension of the professional role.

(...) the end of life needs relational support, support that is only related to a confirmation (...) only a confrontation with a family member, a reassurance. Telecare could be a good thing. (N8)

Theme 4. Challenges in Telecare

Effective implementation of telecare is not without its challenges. Nurses cite a lack of human resources and dedicated time for telecare activities, necessitating a reorganization of work and workloads. They also note that the integration of new technologies requires a shift in mindset and the acquisition of new digital skills, which

could generate resistance, particularly among nurses more accustomed to traditional care models. This highlights the need for ongoing, targeted training to address these challenges. The main challenges to telecare implementation are basically related to the lack of time, resistance to change, need for specific and continuing training, and lack of human resources.

Subtheme 4.1 lack of time and resistance to change

Nurse 4's testimony tells about the lack of time devoted to telecare. The complexity of daily activities already included in their work may limit the ability to devote sufficient time to telecare.

The difficulty lies in putting even this activity (...) in the middle of all the things we have to do, because in my opinion it takes dedicated time. (N4)

Nurses 1 and 2 strongly emphasize the importance of individual attitudes toward telecare. Resistance to change and lack of digital skills of some colleagues who are still oriented toward traditional care can be an obstacle to its implementation. They see telecare as a threat to the workload.

Some colleagues are still anchored in the past and are reluctant to confront new opportunities, such as technology. (N2)

(...) Some colleagues (...) view telecare with adversity (...), some have refused to use it because it is an additional workload for them (...) (N1)

Subtheme 4.2 continuing and specific training

Nurse 9 recognizes the importance of continuing training to meet the new challenges posed by technology. He/she emphasizes the need for constant updating of skills in order to make the best use of the digital tools available.

(...) Continuing education as far as technology is concerned (...), you cannot stop at the knowledge that you already have but it has to be something that goes up." (N9)

In addition to recognizing the importance of continuing education Nurse 1 emphasizes that an efficient use of telecare requires having organizational skills. Nurses must be able to manage the complexity of a caring model that integrates home visiting with telecare.

(...) You have to integrate the home care activity with the tele visit, so you have to have good organizational skills in term of time and resource manage-

ment and especially assessment skills (...) because it has to be part of an organizational model that supports the integration of these measures (...). (N1)

And again, the interviewee raises a crucial aspect for the success of telecare, namely the need for specific privacy and data protection skills to properly manage sensitive patient data and ensure safety even through the use of the platforms.

(...) beyond knowing how to use a computer, the issues with respect to data protection or to the proper management of images and messages that the patient sends via chat, information management, these are all knowledge that we do not have (N1)

Subtheme 4.3 lack of human resources

Participants also tell about staff shortage as a possible obstacle to telecare. Particularly, Nurse 7 emphasizes the need to devote specific time to telecare in addition to ordinary tasks. He/she acknowledges that in order to manage a large number of patients via telecare, an increase in nursing staff is necessary.

(...) the main problem is the shortage of staff. You need people to work on it both in the morning and in the afternoon (...), because if we enroll so many patients, to check them all takes time and resources. (N7)

Nurse 8 reinforces this point by emphasizing the importance of human resources to support technologies. He/she explains how staff shortages can limit the effectiveness of telecare and lead to an overload of work for nurses.

(...)Even if you have technological resources, there are no human resources to support the technology and the demands of the community, so we always end up with few human resources to handle a large healthcare request (...). (N8)

Discussion

The aim of the study was to explore nurses' experience with telecare and their perceptions about implications for caring and the nursing profession. Four main themes and related sub-themes emerged from the interviews with nurses. The first theme deals with the benefits of telecare, which include reducing time and distance in the delivery of care and improving the management of hospitalization. The second theme addresses the disadvantages of telecare, highlighting concerns about the nurse-patient relationship and technological barriers. The third theme concerns the opportunities for professional growth for

nurses, who feel more autonomous and with greater decision-making power. Finally, the fourth theme explores the challenges in telecare, such as lack of time, resistance to change, the need for continuous and specific training, and shortage of human resources.

In relation to the benefits of telecare (Theme 1), the results highlight that telecare offers advantages particularly in reducing time and distance and improving the management of hospitalizations. The nurses' testimonies agree that telecare has expanded access to healthcare, reaching patients who, due to geographic or mobility reasons, would be difficult to reach through traditional healthcare channels. This finding is in line with the literature that highlights how telemedicine and telecare can reduce geographic barriers and improve equity in access to health services, especially for populations in rural or isolated areas [12, 13]. Telecare optimizes time for both patients and healthcare workers. As nurses point out, the ability to perform remote visits and monitoring has reduced the need for travel, resulting in time and cost benefits for both patients and the healthcare system. This is particularly relevant for chronic patients who require frequent check-ups but may have difficulty moving to the regular clinic visits. Nurses also reflect on how telecare can contribute to more effective management of hospitalizations by enabling rapid patient assessment and resolving problems that might otherwise require emergency department access. This aspect is crucial for reducing overcrowding in emergency departments and optimizing the use of hospital resources. In addition, telecare is particularly useful in the management of chronic decompensated patients, by allowing more frequent remote monitoring and timely modification of drug therapy, thus avoiding unnecessary hospital admissions. This finding is in line with several studies that showed the effectiveness of telenursing and telehealth care in the management of patients with chronic conditions such as heart failure [9, 19].

However, the effectiveness of telecare also depends on the availability of a reliable Internet connection, and patients' familiarity with digital technologies. Nurses expressed concerns about technological barriers (Theme 2) especially for the elderly population. They point out that family support is often essential to ensure access to the service, with the risk of excluding patients who cannot rely on such a help. Difficulties also emerged related to the scarcity of technological infrastructure in some geographical areas that may create new inequalities in access to health care, a problem already highlighted in the literature [20–22]. This theme also highlights nurses' concern about the potential loss of the human dimension of care, a central theme of Watson's caring theory and in the debate about telemedicine and telecare [23, 24]. While technological intermediation can facilitate

access to care, it also risks creating an emotional distance between nurse and patient, thus compromising the ability to build a trusting relationship. This aligns with implementation challenges related to ensuring patient-centeredness and maintaining the human aspect in technology-mediated care [25–27]. This concern is shared by other studies that recognize the limitations of telecare in its ability to understand nonverbal cues useful for patient assessment and building an effective caring relationship [28, 29]. Although technology can be an important tool for nurse, it should not replace the development of expert care skills that are based on nuanced human interaction.

However, our study also reveals a potentially conflicting perspective. The existing literature underscores the limitations of telecare in potentially becoming more dependent on the physician and creating tense dynamics [30]. On the contrary, our participants express a sense of autonomy and professional growth facilitated by telecare (Theme 3). This suggests that, with appropriate support and training, telecare can be a tool that may enhance nurses' professional role and decision-making ability. This increased autonomy can be interpreted through Benner's theory, as nurses can acquire higher levels of competence and skill in the management of remote patient care. This result also relates to Watson's theory of caring, highlighting that professional growth, when it enables more holistic patient management, can indirectly contribute to a caring environment. Literature supports this finding highlighting that the ability to manage the patient from hospital to home gives nurses an active and responsible role, thus contributing to greater personal satisfaction [31–33]. In addition, the participants report that telecare can foster an ongoing relationship with the patient, something that has been recounted by nurses as difficult to ensure in other care settings. This reflects previous research showing that the ability to taking care patients over time allows the nurses to build a relationship of trust and monitor patients' health condition more effectively, thus building an effective therapeutic relationship at distance [34].

The last theme concerns the challenges and obstacles to the effective implementation of telecare (Theme 4). The lack of time to devote exclusively to telecare activities, necessitate a reorganization of work and workloads. A balance should be reached between traditional activities and the new responsibilities associated with telecare in order to avoid work overload and ensure the quality of care. These findings are in line with the literature about the challenges in implementing telecare interventions, which refers issues such as reviewing workloads, staff resilience, the need for adequate training, and resource allocation [35]. In addition, nurses' testimonies suggest that the integration of new ways of working require a change in mindset and digital skills, which

may generate fear and resistance, especially among colleagues more tied to traditional caring. In this sense, there is a need for ongoing, targeted training to address these challenges. Training is crucial for nurses to move from the 'novice' stage until 'proficient' or 'expert' levels in telecare, according to Benner's theory. Nurses should be able to effectively use digital tools, but also to manage the complexity of an integrated caring model that combines home visiting with telecare [25, 36, 37]. Finally, the need for training also relates to the acquisition of specific knowledge about privacy and data protection. As also highlighted by other studies, effective telecare implementation, it is not enough to have technological skills, but also specific knowledge related to the management of organizational, ethical and legal aspects about telecare service [38–40].

The literature on the topic has highlighted an interesting aspect that did not emerge from the participants in this study: telecare may promote patient empowerment by encouraging patients to become more active and autonomous in controlling their pathology. This empowerment is particularly evident when a relationship of trust is established between patients and professionals [41]. However, this study reinforces the importance of building a trusting relationship between nurses and patients as a fundamental element of effective care. These findings align with existing literature, which highlights that trust fosters collaboration strengthens the therapeutic bond, both of which are critical for achieving positive health outcomes [19].

Practical implications

The results of this study suggest that effective implementation of telecare should take into account not only its potential benefits for patients and nurses but also the challenges related to the nurse-patient relationship and technological barriers. Healthcare organizations should invest in comprehensive and ongoing training programs to address the challenges related to technology adoption and ensure nurses' competence. These programs should include specific training on using telecare platforms, devices, and software with user-friendly interfaces and troubleshooting common technical issues. Training should be adapted to different levels of digital literacy, recognizing the needs of both younger and older nurses. Given the concerns about the nurse-patient relationship, training should emphasize communication techniques for building trust and empathetic relationship in remote settings. Additionally, nurses need training on how to effectively integrate telecare into existing workflows, including time management strategies, prioritization of remote visits, and coordination with other healthcare professionals. This involves developing clear guidelines and protocols for when and how to use telecare

for specific patient populations and conditions. Telecare should not be seen as a replacement for the traditional caring relationship, but as a complementary tool to improve healthcare, especially for patients with chronic conditions that require continuous monitoring. Finally, it is important to address ethical challenges related to the use of telecare, such as protecting patient privacy. Training on data protection regulations, secure communication practices, and ethical considerations in telecare (e.g., informed consent, confidentiality) is crucial.

Policymakers and healthcare managers should recognize the need for adequate investment in the infrastructure and resources necessary to support telecare services. This includes ensuring reliable internet connectivity, providing necessary hardware and software, and establishing user-friendly platforms. Attention should be paid to addressing disparities in access to technology, particularly in underserved or remote areas. Flexible working models should be developed to account for the time required for remote monitoring, virtual visits, and related administrative tasks. Finally, easier and more accessible technological systems should be implemented to facilitate data sharing between telecare platforms and other healthcare services in the community, promoting coordination of care and reducing fragmentation.

Limitations and future research

While this study provide valuable knowledge about nurses' experiences and perception of telecare, it has some limitations typical of qualitative research. The small sample size and the specific context in which the research was conducted may limit the generalizability of the findings to the broader population of nurses with experience in telecare. The participants were recruited from a single Local Health Authority within a central-Italy region and from one specific telecare service for heart failure patients. This homogeneity in the sample would limit the generalizability of the findings. Nurses' experiences and perceptions of telecare may vary across different regions, healthcare settings, and patient populations. For example, telecare implementation in rural areas with limited technological infrastructure may present different challenges compared to urban areas. Similarly, nurses working with different patient groups might have distinct perspectives and experiences. Furthermore, the process of recruiting participants may have generated a selection bias. It is possible that nurses favorable to telecare or with positive prior experience were more likely to participate, while nurses less inclined or with negative experience may have avoided offering themselves. This potential bias may have influenced the positivity of the results, especially regarding professional growth and autonomy. Although the study captured different aspects of telecare, there was a predominant emphasis on the benefits and opportunities

associated with the service. This could be due to the mentioned selection bias or reflect the fact that the participants were already working within a telecare service and had adapted to it. However, we acknowledge that this focus may have limited the exploration of more critical or negative viewpoints. Finally, the analysis of qualitative data, although was conducted with methodological rigor, is itself subject to interpretation by the researchers. Nevertheless, the triangulation of the data and the efforts by the researchers to ensure methodological rigor, helped reduce the risk.

These findings can be a basis for future quantitative-approach studies focused on developing interventions to overcome technological and relational barriers. As research suggests the importance of building trust within the care relationship, the nurse has a crucial role in facilitating the functional use of technology in care. Future studies could investigate the potential moderating effect of a trusting relationship between technologies and the effectiveness of patient behaviors (e.g., compliance, education). Further research is also needed to investigate the impact of telecare on patients' quality of life, nurse and patient satisfaction, and overall efficiency of the service.

Conclusions

In conclusion, this study emphasizes that telecare may be a useful tool to improve healthcare delivery by improving access in particular for vulnerable populations. However, effective implementation would depend on overcoming key challenges. The successful integration of telecare into practitioners' routines would require a systemic approach that goes beyond the simple adoption of new technologies. It would require a strategic investment in infrastructure, comprehensive education and training for nurses, and a change in organizational culture that embraces new models of care.

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Author contributions

IP, BB, and MG: conceptualization, methodology, data analysis, data interpretation, writing—original draft, supervision; DB, VP, SDS, MM, JP: data analysis, data interpretation, writing – review & editing. All authors read and approved the final manuscript.

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Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The study is part of a project funded by a local institution of the region and received approval from the local Ethics Committee of the University of Cagliari (Prot. no. 0077639 of 03/13/2024). The study complies with the ethical principles of the Helsinki Declaration (World Medical Association, 2013) and the ethical guidelines (Sect. 8) of the American Psychological Association (2020). Participation was voluntary and anonymous based on Italian privacy law (e.g., Decree n. 196/2003) and nurses were informed that they could leave the study at any time without any repercussions. Verbal informed consent to participate in the study was obtained from the participants prior to starting the interview.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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