Research

What do nurses think about telenursing? A descriptive Italian study

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Abstract

Introduction: Telenursing is a new nursing approach to improve continuity, quality and safety of care and patient outcomes. This study aims to describe the viewpoint of Italian nurses on their knowledge, attitudes, and barriers to telenursing.

Materials and methods: This descriptive study following the STROBE guidelines was conducted in August 2022 through a web survey. A non-validated questionnaire and convenience snowball sampling were used. Descriptive statistical analysis was performed.

Results: 323 nurses were included in the study. 75% of nurses were female, prevalently employed in hospitals (81%). Digital devices were present in 76% of healthcare facilities, but 82% of the sample had never carried out telenursing interventions. The academic training of 75% of nurses does not include telenursing education, and 93% of the sample would be interested in

training on the topic, considering their previous knowledge insufficient (54%). Surveyed nurses believe telenursing could improve communication in the care team, patient safety (70%), and quality of care (45%). In nurses' opinion, patients' main barriers would be low digital literacy, use complexity and lack of resources. In addition to sharing the same barriers as patients, nurses need more skilled and exclusively assigned staff and better interconnection between the resources used.

Conclusion: In Italian nurses' opinion, telenursing should improve the quality and safety of care and team communication. The main barriers described by the present study (lack of knowledge, resources, integration, and complexity of the tools used) suggest the need for multi-level interventions and studies to increase its use between nurses and patients.

Keywords: Attitudes; Barriers; Descriptive study; Knowledge; Nurse; Quantitative Research; Telenursing; Web survey.

INTRODUCTION

Telenursing is a new nursing approach that uses Information and Communication Technologies (ICT) to improve patient-centred care, quality and safety of care and patient well-being[1,2]. It also enhances health education, counselling, direct surveillance and frequent contact between providers, patients and caregivers[3], reducing healthcare resource utilisation[4]. Although telenursing has increased after the COVID-19 pandemic, its implementation in patients' care pathways is still different worldwide[5-7]. Nurses' widespread use of telenursing interventions is related to personal, organisational, and system variables that can encourage or reduce its use[8]. Some factors such as training, experience, managerial support, leadership commitment, and sharing health objectives can be strategic for this care approach[8]. Indeed, it is well known how patient and healthcare professional resistance to innovations, such as e-health, can hinder or disrupt changes in the clinical process[9]. Concerning training and education, nursing students are still too poorly and heterogeneously trained worldwide to address these topics[10]. In this regard, specific training appears essential to increase skills and reduce barriers and stereotypes to using telenursing in nursing students and, consequently, nurses[11]. Regarding experience, many studies suggest that complex and poor use and scarce available resources are the main barriers to healthcare professionals and patients using this care approach[12,13,14,15]. One of the most widespread stereotypes among nurses concerns the difficulty in using telenursing by older patients, although the literature does not highlight particular barriers about age (16). Furthermore, to be accepted by nurses, the health objectives of healthcare organizations should be shared, proportional to available resources and patient needs and guided by leadership able to drive changes in clinical practice[9,17]. However, only if adequately chosen, introduced, and supported by organisations can the great potential of ICT and telenursing, in particular, positively impact the performance of nurses and patients' outcomes[18]. Knowledge of nurses' attitudes, barriers, acceptance, usefulness and points of view on Telenursing is a strategic element to increase its use[19].

Considering the complexity and heterogeneity of patient and nurse-related factors to implement telenursing interventions[11,20,21], this descriptive study aimed to describe the knowledge, attitudes and barriers of an Italian nursing sample towards telenursing, examine their inclination to adopt telenursing services and interventions in their professional roles and assess their viewpoint on the importance of integrating telenursing interventions into the national healthcare system.

MATERIALS AND METHODS

Study design

A descriptive study was conducted using a web survey. The tool used was an ad hoc developed questionnaire based on the preliminary comprehensive literature review[22,23,24,25,26] developed by the research team. Although the tool has not been previously validated, ten

respondents for each item were considered for sample size calculation, according to the guidelines for developing, translating and validating a questionnaire,[27,28]. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement Guidelines for observational studies were used to improve the study's reporting (Supplementary File 1)[29]. The web survey was conducted between August 01 and August 31, 2022. Convenience snowball sampling was used for the study's aims[30].

Supplementary File 1: STROBE Checklist

The web-survey questionnaire

The 29 items of the self-administered questionnaire described sociodemographic and professional information, nurses' knowledge, attitudes, and barriers to telenursing. In particular, it was divided into three main sections:

1. Sociodemographic and professional information (12 questions).
2. Knowledge and attitudes (8 questions).
3. Barriers to the use of telenursing (9 questions).

The tool used a free Google Form tool in August 2022. A brief description introduced the aims and objectives of the study, respect for privacy and anonymity in data collection and analysis, and the time required for compilation (about 10-15 minutes). All questions were mandatory, closed, and single- or multiple-choice. Participants had to express their consent within the survey to answer the questions. Each nurse was asked for an email address, allowing them to complete a single web survey. In the second and third sections, items used a five-point Likert scale ranging from 1 = "strongly disagree" to 5="strongly agree" to assess nurses' knowledge, attitudes, and barriers to telenursing. A copy of the tool is available from the corresponding author at reasonable request.

Study sampling

The study was designed by the nursing research team of an Italian Cancer Center, and participation was voluntary. It was extended to nurses interested in the project by sharing the link via instant messaging applications, social media or email among nurses from Northern, Central and Southern Italy. Consent was sought from nurses before beginning data collection. According to the snowball sampling recruitment[30], the nurses involved in the study shared the tool with other nurses.

Inclusion criteria: nurses who could read and speak the national language and were willing to adhere to study procedures. Nurses engaged in clinical, organizational, training and research fields, including managers.

Exclusion criteria: retired nurses, nursing students and other healthcare professionals.

Variables

The study's primary outcome was the exploration of the main nurses' knowledge, attitudes and barriers related to telenursing. In addition, socio-demographic and professional characteristics were collected.

The socio-demographic data were described in the first and the second sections of the tool. Data included gender, age, professional degree (date and title), postgraduate training, employment (setting, location and years of employment), use of the internet, and digital devices in the workplace.

Knowledge related to telenursing has been described in the third section of the tool: academic training, interest in postgraduate training, confidence in the use of telenursing, favourite tools, previous use of telenursing, health reimbursement, the influence of SARS-CoV-2 pandemic on the use of telenursing.

The main barriers were described in the last section of the tool: beliefs about the quality of remote care versus traditional care, the impact of telenursing on communication and patient safety, nurses' beliefs about the main barriers to telenursing by nurses and patients, main uses of telenursing in clinical practice, nurses' challenges related to the use of telenursing, supply of devices to patients.

Data analysis

Data collected was imported into Microsoft Office Excel software, and Statistical Package for Social Science 21.0 software (SPSS, Chicago, IL) was used for data analysis. Descriptive statistical analysis was used to summarise all variables of interest. Absolute frequencies, percentages, mean, and standard deviation were assessed for continuous data.

Ethics and Dissemination

Data collection and analysis were performed in aggregate and pseudonymized ways. The study was conducted according to the Declaration of Helsinki[31]. No sensitive or identifiable

information was obtained from the nurses who voluntarily and anonymously participated in the study. Before the questionnaire, within the Google Form web survey, responders confirmed the reading of the study summary, including the aims, modality of data collection, and relative topology. Moreover, it was specified that findings will be presented in the aggregate form and cannot be directly attributed to the subjects involved in the study.

RESULTS

Characteristics of the sample

Three hundred twenty-three nurses took part in the survey. Of these, 74.6% (n=241) declared themselves as female, and the average age of the sample was approximately 43.24 ± 11.75 years (11.75; range 22-66). The majority of the sample (n=163, 50.5%) reported having obtained a university bachelor degree to practice the nursing profession, and 69.3% (n=224) had furthered their education with a post-graduate degree,master of science degree in nursing, master's degree, or doctoral degree. Regarding work experience, most of the sample was employed in a hospital setting (n=263, 81.4%), predominantly in a medical area (n=94; 29.1%) or critical care unit/emergency department (n=74; 22.9%). No withdrawal was observed during the study due to the nature of the web survey. Table 1 shows the demographic characteristics of the sample.

Table 1: Demographic characteristics of the sample

Variable	n (%)
Gender (*Male vs Female vs other*)	81 (25,1) vs 241 (74,6) vs 1 (0,3)
Basic educational qualification	
Regional title	89 (27,6)
Nursing school diploma	62 (19,2)
Bachelor's degree	163 (50,5)
Master's degree	5 (1,5)
Post-basic educational qualification	
None	99 (30,7)
Post-basic qualification (advanced course, specialization, master's degree, or PhD)	224 (69,3)
Work setting	
Hospital	263 (81,4)
Private nursing home and clinic	10 (3,1)
Territorial health care facility (Local Health Authority, clinic, etc.)	27 (8,4)
Home care context	5 (1,5)
IRCCS (Scientific Institute for Research, Hospitalization and Health Care)	8 (2,5)
Management of various contexts (University; Bachelor's degree program)	6 (1,9)
Protected structure for the elderly; Rems	3 (0,9)
Clinical setting	
Medicine	94 (29,1)
Surgery	55 (17,0)
Critical Care/Emergency, Operating Room, Intensive Care Unit (ICU)	74 (22,9)
Outpatient Clinic; Service	32 (9,9)
Day Hospital	8 (2,5)
Education	8 (2,5)
Research	9 (2,8)
Management, Coordination, Healthcare Management, Case Management; Department of Healthcare Professions	35 (10,8)
Home Care, Home Service	3 (0,9)
None	5 (1,5)

The participants' internet usage capacity was investigated. The majority of the examined sample used the internet for non-work-related activities for a duration ranging from 1 hour to 5 hours (n=122; 37.8%), while the percentage of the sample using the internet for strictly work-related purposes for 1 to up to 5 hours raised to 42.1% (n=136). Notably, 75.5% of the sample (n=244) reported that the use of digital devices (tablets, computers, and smartphones) is allowed in the healthcare setting.

Knowledge and attitudes towards telenursing

As shown in Table 2, 17% (n=55) of the surveyed sample reported having good/excellent knowledge about the use of telenursing vs. 54.5% (n=176) who had not. Regarding potential training, 75.5% of the sample (n=244) stated they did not receive telenursing education during their academic training. The willingness to delve deeper into this topic was high: 92.9% (n=300) of the sample would be interested in specific training to learn more about the use of telenursing tools.

Confidence in telenursing tools was predominantly appropriate (n=242; 75%) in the sample, declaring feeling moderately, very or totally capable of using the tools to provide remote assistance to patients. The remaining 25% (n=81) of nurses considered need more confidence in its use. The preferred tools by the sample were video calls (n=197; 61.0%), dedicated apps and platforms (n=193; 59.8%) and instant messaging (WhatsApp) (n=168; 52.0%). Telephone calls were the least suitable tool in the sample (n=228; 70.6%). Telenursing was not a common and usable reality for most of the sample (n=264; 81.7%), and most of them (n=268; 83.0%) needed to be made aware of an active national reimbursement system for telenursing interventions. 61.3% (n=198) of the interviewed sample stated that the pandemic had influenced its use.

Table 2: Knowledge and attitudes towards telenursing

Variable	n (%)
How do you judge/assess your level of knowledge regarding the use of telenursing?	
Poor	87 (26,9)
Insufficient	89 (27,6)
Sufficient	92 (28,5)
Good	47 (14,5)
Excellent	8 (2,5)
Has your academic education addressed the use of telenursing tools in healthcare?	
No	244 (75,5)
Yes	52 (16,1)
Would you be interested in participating in training courses on the use of telenursing tools in clinical settings?	
No	23 (7,1)
Yes	300 (92,9)
How confident do you feel about using telenursing tools (video calls, monitoring, data collection on specific platforms, etc.) to provide remote assistance (e.g., patient at home and nurse in a hospital setting)?	
not at all	14 (4,3)
a little	67 (20,7)
moderately	120 (37,2)
very	93 (28,8)
totally	29 (9,0)

What tools would you prefer?	
email (no/yes)	203 (62,8) / 114 (35,3)
instant messaging (SMS, WhatsApp, etc.) (no/yes)	155 (48,0) / 168 (52,0)
phone calls (no/yes)	228 (70,6) / 95 (29,4)
video calls (no/yes)	126 (39,0) / 197 (61,0)
apps and platforms (no/yes)	130 (40,2) / 193 (59,8)
In your current organisational context, have you ever used telenursing services to provide assistance to patients?	
No	264 (81,7)
Yes	59 (18,3)
Are you aware of any reimbursement system active in our country for Telenursing services?	
No	268 (83,0)
Yes	12 (3,7)
How do you think the provision of nursing care 'at a distance' has been used after the COVID-19 pandemic?	
increased	198 (61,3)
decreased	32 (9,9)
neutral	34 (10,5)
I don't know	59 (18,3)

Barriers and facilitators to the use of telenursing

69.3% of the surveyed sample (n=224) believes that remote nursing support, in addition to traditional care, allows nurses to deliver equal or higher-quality services than traditional ones (Table 3). Furthermore, according to most of the sample, these telenursing tools could improve communication within the care team (n=225; 69.6%) and patient safety (n=213; 65.9%).

The questionnaire also described the main barriers perceived by nurses and patients to use telenursing tools. Among the patient barriers, nurses considered the low literacy and knowledge of the tools (n=230; 71.2% of the sample considers the low literacy of patients a barrier), lack of access to the internet or appropriate devices (n=177; 54.8%), and the complexity of the tools used (n=176; 54.5%).

Regarding the main barriers perceived by nurses to the use of telenursing, nurses stated a lack of skilled nursing staff (n=190; 58.8% of the sample considers it a barrier) and low knowledge and familiarity with the tools (n=176; 54.5%). The perception that telenursing may allow nurses to deliver lower quality care than traditional nursing practice lack of time, poor interconnection and integration of electronic tools, lack of support from operational management, or fear of establishing ineffective communication with the patient are barriers stated by 21,4% (n=69) of the sample.

Furthermore, regarding the purposes of telenursing, the surveyed sample believes it could be very useful for:

- Therapeutic education (n=241; 74.6%): This refers to situations where nurses use telenursing tools and services to support patients and caregivers in the therapeutic process.
- Follow-up (n=182, 56.3%): This refers to the support in chronic conditions in addition to traditional care in person.
- Patient monitoring and care (n=168; 52.0%): This refers to situations where the patient monitors vital signs, signs and symptoms and sends data via a digital platform integrated within the electronic medical record.

Nine nurses (2.8%) would prefer not to use telenursing.

Most of the sample agreed that implementing care through telenursing tools could represent a professional growth opportunity for nurses (n=261; 80.8%). Furthermore, most of the sample would be more inclined to use telenursing tools and services for:

- Managing chronic patients (e.g., neurodegenerative diseases, diabetes, cancer, etc.) (n=243; 75.2%).
- Managing temporary follow-up (e.g., post-surgical intervention) (n=215; 66.6%).

Table 3: Resistances and barriers to the use of telenursing

Variable	n	%
Remote nursing support, in addition to traditional care, enables nurses to provide care:		
of lower quality compared to traditional care	38	11,8
of equal quality compared to traditional care	77	23,8
of higher quality compared to traditional care	147	45,5
I don't know	61	18,9
In your opinion, could the use of telenursing improve communication within the care team?		
not at all	10	3,1
slightly	22	6,8
neutral	66	20,4
greatly	203	62,8
completely	22	6,8
In your opinion, could the use of telenursing improve patient safety?		
not at all	7	2,2
slightly	28	8,7
neutral	75	23,2
greatly	192	59,4
completely	21	6,5
In your opinion, what could be some of the main barriers for *patients* when it comes to using telenursing tools? (phone calls, video calls, apps, platforms, etc.)		
	no	**yes**
Cultural barriers	164 (50,8)	159 (49,2)
Complexity of the tools used	147 (45,5)	176 (54,5)
Low digital literacy	93 (28,8)	230 (71,2)
Lack of access to the Internet or appropriate devices	146 (45,2)	177 (54,8)
Inability or unwillingness to make video calls	204 (63,2)	199 (36,8)
Distrust in the use of telenursing services and tools	206 (63,8)	117 (36,2)
No barrier	318 (98,5)	117 (36,2)
According to your opinion, what could be some of the main barriers for *nurses* when it comes to using telenursing tools (phone calls, video calls, apps, platforms, etc.)?		
	no	**yes**
Cultural barriers (beliefs, convictions, training, etc.)	205 (63,5)	118 (36,5)
Limited familiarity with telenursing tools	147 (45,5)	176 (54,5)
Nursing care not suitable for remote use	250 (77,4)	73 (22,6)
Lack of time	243 (75,2)	79 (24,5)
Poor interconnection and integration among electronic tools used (electronic medical records, portals, data collection systems, applications, etc.)	177 (54,8)	146 (45,2)
Lack of dedicated staff for telenursing services	133 (41,2)	190 (58,8)
Lack of support from the operational management of the healthcare facility	205 (63,5)	118 (36,5)
Lack or inadequacy of reimbursement systems	258 (79,9)	65 (20,1)
Lack of appropriate devices/malfunctioning	192 (59,4)	131 (40,6)
Absence of direct contact with the patient	252 (78,0)	69 (21,4)
Fear of establishing ineffective communication with the patient	254 (78,6)	69 (21,4)
Provision of nursing care of lower quality compared to in-person care	287 (88,9)	36 (11,1)
Ineffective or absent training for operators	188 (58,2)	135 (41,8)
No barrier	316 (97,8)	7 (2,2)

Which purposes and aspects do you consider most appropriate for telenursing services?		
	no	**yes**
Monitoring and care: Patients record vital signs, signs, and symptoms and send data through a digital platform integrated into the electronic medical record.	152 (47,1)	168 (52,0)
Monitoring and care: Nurses contact patients via phone/video for the assessment of vital signs, signs, and symptoms.	183 (56,7)	138 (42,7)
Therapeutic education: Nurses use telenursing tools and services to support patients and caregivers in the therapeutic process.	80 (24,8)	241 (74,6)
Continuous patient monitoring.	167 (51,7)	153 (47,4)
Follow-up: Support for chronic conditions in addition to traditional in-person care.	139 (43,0)	182 (56,3)
Timeliness of intervention.	183 (56,7)	138 (42,7)
Promotion of equity in access to care.	251 (77,7)	70 (21,7)
Increased patient satisfaction.	199 (61,6)	122 (37,8)
Increased satisfaction of healthcare providers.	251 (77,7)	70 (21,7)
I would not use remote assistance.	312 (96,6)	9 (2,8)
Would you be more inclined to use telenursing tools and services for purposes of:		
	no	**yes**
Prevention	127 (39,3)	195 (60,4)
Nursing Diagnosis	237 (73,4)	86 (26,6)
Treatment and care	214 (66,3)	109 (33,7)
Management of temporary follow-up (e.g., post-surgical intervention)	108 (33,4)	215 (66,6)
Management of chronic patients (e.g., neurodegenerative diseases, diabetes, cancer, etc.)	80 (24,8)	243 (75,2)
Management of patients in palliative care	187 (57,9)	136 (42,1)
Professional training and updating	172 (53,3)	151 (46,7)
If you have provided assistance through telenursing tools and services, who provided the necessary devices to patients? (select multiple options if applicable)		
	no	**yes**
Healthcare facility	286 (88,5)	36 (11,1)
National Health System	304 (94,1)	18 (5,6)
Patients purchased the tools independently	287 (88,9)	35 (10,8)
Health insurance	319 (98,8)	3 (0,9)
I do not use telenursing systems and services	201 (62,2)	121 (37,4)
In your opinion, could the implementation of nursing care through telenursing tools represent an opportunity for professional growth for nurses?		
	n	**%**
Strongly disagree	4	1,2
Disagree	2	,6
Neutral	56	17,3
Agree	173	53,6
Strongly agree	88	27,2

DISCUSSION

This descriptive study used a web survey to describe nurses' points of view about knowledge, attitudes and barriers to the telenursing care model. International literature underlines the importance of skills, education, communication, and nurses' satisfaction with telenursing in terms of health outcomes, continuity, and quality of care[32,33,34,35,36]. Of the 323 nurses involved in the study, only 1.5% (n=5) work in home settings and 8,4% (n=27) in primary care, where telenursing can effectively improve the continuity and quality of care[37], reducing barriers such as distance and transportation costs[38].

Like other countries[37,39], in nurses opinion several factors must be addressed to increase these outcomes and improve nurses' clinical practice and satisfaction using health technology and telenursing[37]. International studies suggest that education and training in healthcare technologies represent a strategic factor for implementing this healthcare model among nurses[40], in line with the interest in training described by the surveyed sample.

Consistent with Ranjbar and colleagues[25], 75% (n=244) of the surveyed nurses use digital devices in the workplace, but only 18% (n=59) of them used telenursing interventions and believe they need more knowledge about this topic (n=176, 54%). In this regard, 93% (n=300) of the sample would be inclined to participate in specific professional training on telenursing, trying to bridge the academic gap of knowledge of more than 75% of them (n=244). Like other colleagues worldwide, these results suggested the need to improve nurses' training paths in using digital resources in clinical practice[41]. Similarly to Hicks' results[42], 81% (n=261) of the surveyed nurses considered telenursing a challenge for professional growth, and only 2% (n=6) of them did not consider it as such.

For approximately only 10% (n=32) of nurses, telenursing would not enhance communication in the care team and patient safety, suggesting a positive attitude of 70% (n=225) of them to this care model. At the same time, according to international studies, almost all of the sample stated that patients and colleagues have one or more barriers to telenursing, highlighting multifactorial nurse barriers and stereotypes on the topic to explore with future studies[8].

Telephone calls were the tool most used by nurses involved in the study but the least preferred, contrary to some international evidence on their positive impact in managing chronic conditions[43]. Despite the complexity highlighted by some studies[44], the study findings suggested that video calls, apps and platforms were the tools that 60% (n=193) of the sample would use in clinical practice. It could be hypothesised that for nurses with good digital knowledge, phone calls could be different interventions from telenursing[38], unlike apps and digital platforms[45]. However, in this regard, more studies were needed to assess the effectiveness of telephone-derived nursing interventions[46].

According to international literature, nurses consider therapeutic education appropriate for telenursing intervention to support patients and caregivers in the therapeutic path, especially in chronic conditions[47] Furthermore, in agreement with the significant reduction in symptoms ($p < 0.0000$) from the telenursing monitoring program in the study by Bernocchi and colleagues[48], more than 43% (n=138) of the surveyed nurses considered telenursing suitable for follow-up and monitoring vital parameters. Nurses involved in the study do not consider telenursing a tool to improve equity, access to care and nurse satisfaction. These results could be explained from the perspective of the most vulnerable populations, for whom digital technology may represent a further barrier to accessing care and a cause of increased inequalities[49,50]. Furthermore, it could also be due to the specific contexts of the nurses interviewed and the Italian healthcare system. According to Georgsson and colleagues[12], for nurses involved in the study, patients' main barrier to telenursing is poor digital literacy, followed by a lack of access to the Internet and the complexity of the tools to use. These results align with some international literature, which considered older adults and people with low digital literacy and income at risk for accessing this care model[51,52]. However, a recent bibliometric analysis[47] suggests that this care model is increasing in older adults with chronic diseases. Although telenursing is viewed as an opportunity for professional growth (81% of nurses agree vs 2% who do not vs 17% irrelevant) and improvement in care (45% of the sample believes telenursing in addition to traditional care could provide higher-quality care vs 12% lower-quality care vs 43% irrelevant) by the sample interviewed, the lack of satisfaction could be related to the barriers nurses perceive. In line with Navarro-Martinez et al.[49], among

the significant barriers to telenursing for nurses arises the need for more exclusively dedicated and skilled staff (n=190; 59%). Moreover, this barrier could probably be related to the recent severe worldwide shortage of nurses, highlighted by the SARS-CoV-2 pandemic. The benefits offered by this care model could, in this regard, help address the global health workforce emergency, strengthening the humanisation of care[49].

The poor interconnection between the digital tools in different settings (n=146; 45%) represents a critical barrier identified by surveyed nurses. In this regard, some studies suggest using simple and interconnected tools in clinical practice to improve care effectiveness and safety[53,54]. Consistent with international literature[1], organisational support is crucial for 36% (n=118) of the sample to promote the implementation of telenursing in clinical practice. Furthermore, according to the international literature, the sample interviewed stated that appropriate and easy-to-use technologies, adequate turnover, and a shared mission with the staff are essential factors in overcoming nurses' resistance[12,34,41,55].

Implications for future research and clinical practice

The findings of the present descriptive study highlighted nurses' perspectives on the strengths and barriers to telenursing, which should be considered in the design and implementation phases of telenursing services and interventions. Academic education in nursing science should include telenursing education to promote nurses' knowledge and use of ICT, reducing barriers between nurses and patients[56]. Regarding the training, it would be interesting to improve the understanding of the attitudes toward telenursing professionals with similar education (i.e., midwives) to compare the differences in satisfaction and use[25]. Rigorous efficacy studies should be conducted to assess the effectiveness of telenursing interventions compared to in-person nursing interventions and increase the experience and skills of nurses in this topic, as expected by the surveyed sample. Furthermore, future research could explore which interventions and tools nurses identify with telenursing and their effectiveness in clinical practice, quality, and care safety.

The authors believe qualitative research could improve exploring this poorly researched topic, providing helpful information for clinical practice. In particular, the qualitative approach could explore nurses' and patients' experiences using telenursing in-depth to improve their satisfaction, utilisation, and patient outcomes[1,57]. Nursing research on the use of telenursing could finally, in the opinion of the authors, highlight the lights and shadows of a care approach aimed at promoting continuity, quality and safety of care[1,2,3,4].

Limitations

The authors are aware of the limitations of the present study. The principal limit is the non-validated questionnaire used, which could affect the the accuracy and reliability of the study findings. Due to the nature and context of the present study (a descriptive Italian study), the results may also have been influenced by context-related beliefs and opinions of the Italian nurses involved. The sample size should be considered in the generalizability of the results. Furthermore, the online web survey does not allow the authors to assess that only nurses were involved in the project and that they provided only one answer to the survey. However, considering the spread of SARS-CoV-2 at the time of data collection in 2022, the authors considered the online survey to be a safe tool for the nurses included in the study. Finally, the lack of previous experience, as stated by 82% (n=264) of the surveyed nurses, could influence the reliability of the answers and the generalizability of the results. More extensive and rigorous studies should be conducted to address this interesting nursing area.

CONCLUSIONS

This descriptive study described nurses' viewpoints on their knowledge, attitudes and barriers to telenursing, suggesting that telenursing interventions could promote a global approach while at the same time enhancing inequalities in access to healthcare[1,2,35]. Despite the lack of knowledge and experience, only a few nurses believe telenursing can worsen clinical practice. Almost all of them would be interested in increasing their knowledge on the subject and would consider telenursing a professional challenge, suggesting a positive attitude to its use. The barriers shared with patients (poor training, resources, organizational and structural support) suggest that the diffusion of telenursing requires multi-level interventions involving the stakeholders[41]. Furthermore, further studies are needed to test its sustainability and effectiveness in improving safety, quality of care and user satisfaction. Finally, as suggested by the surveyed sample who consider telenursing suitable for nursing care, in the authors' opinion, the strengths of telenursing can contribute to improving care without affecting the nurse-

patient relationship, which remains among the greatest strengths of nurses.

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