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Original scientific paper

An E-Delphi Study to Identify Core Competencies for Managing Chronic Patients' Needs Through Telecare

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Abstract

Introduction. Since there is an increase in chronic disease prevalence, there is a global challenge in the field of healthcare professional education in effectively treating chronic patients. Telecare is an effective way of caring for specific populations and situations, but it requires specific competencies and skills from health professionals.

Aim. To recognize core telecare competencies of healthcare professionals for the management of chronic patients, as part of the "BeEmTel: Beyond the Emergency. Telecare for Non-Communicable Diseases through Simulation Techniques" project.

Methods. A three-round e-Delphi study was conducted from May to August 2022. A panel of 26 experts from five European countries was asked to approve, modify, or add items and then prioritize each competence.

Results. This e-Delphi resulted in 37 competencies included in 12 domains: laws/normative/ethics, multidisciplinary team, shared decision-making, patient/caregiver education, relationship, assessment/evaluation, planning, knowledge/ability, communication, risk evaluation, psychological and emotional support and family involvement. From the total of 37 competencies, experts agreed about the score of 22 of them. The agreement in all competencies ranged from 92.4% to 100% (defined as >75% agreement).

Conclusions. The results of this study will provide the basis for European educational institutions to develop educational programs on telecare in chronic diseases as well as to establish national policies on telecare.

Introduction

The increasing global ageing of the population is described by the World Health Organization (WHO) as a critically important issue for the socioeconomic and medical community (1). Unfortunately, the number of older people is rising disproportionately and most people are expected to live to age 60 and beyond (2). Older adults have expectedly higher rates of reported chronic diseases (3).

Chronic diseases are mainly non-communicable diseases generally lasting at least one year, having slow progression and typically require ongoing medical care (4). The four main types of chronic diseases are cardiovascular diseases, cancers, chronic respiratory diseases and diabetes (5). Chronic diseases management includes numerous long-term treatments and an increased demand for healthcare services that lead to excessive costs, inadequate access to care, sometimes poor quality of care (due to lack of education and resources) (6), and poor quality of life of the elderly (3).

Therefore, chronic diseases have become a major problem for the individual, the communities and society as a whole. Undeniably, science is galloping as new methods are found to manage chronic diseases in various hospital and community settings. Therefore, new and promising technologies are being used, such as telecare. Telecare is the use of information, communication, and monitoring technologies which allow healthcare professionals to remotely evaluate health conditions, educate, or deliver healthcare interventions to patients at home or in community settings (7).

Especially during the COVID-19 pandemic, telecare was widely used due to social restrictions. It facilitates health care, particularly in remote or underserved areas. Telecare can improve patient outcomes through the supplementation of the in-person management of chronic diseases, with approaches such as remote monitoring and patient education (8). The most commonly used technologies are those with a monitoring function and systems with reminders, advice, or self-care instructions. An important factor in these systems is their usability, which can help chronic patients to accept and engage in the telecare monitoring systems, making them more independent in their own homes (9).

Telecare is believed to be a revolution of healthcare systems, so it is essential to reflect on the training of healthcare professionals in order to become skilled to engage into telecare and integrate it into their daily clinical practice (10). Indeed, the growing utilization of telecare practices brings considerations about the training and skills of healthcare professionals to use it both effectively and correctly (11). Major barriers to telecare use among healthcare professionals include the lack of knowledge and competence (12). On the other hand, telecare training induces the willingness, readiness, compliance and confidence in using telecare (13).

Based on Miller's pyramid of clinical competence, telecare provision by healthcare professionals requires knowledge on the basis of telecare practices as well as competencies including theoretical knowledge, the basic understanding of telehealth, its tools and its applications, practical skills, and attitudes (14, 15). Also, having knowledge on issues of confidentiality and data protection is of great importance (16).

As shown by two recent reviews, there is no systematic approach regarding the incorporation of telecare in healthcare professionals' training curricula (17, 18). Nevertheless, standards and guidelines for the creation of telecare courses are increasing and they mainly focus on organizational, ethical, clinical, technical and soft skills instead of the specific needs of healthcare professionals (15). Nowadays, there is growing body of literature on teaching and training of telecare competencies, but the methods of their implementation still lack in the academic field. Telecare competencies are being more and more recognized – they are included into the regulations – but still, the application of telecare curricula is complex (19). The most cited competency frameworks are those published by the Accreditation Council for Graduate Medical Education (ACGME) (20) and Association of American Medical Colleges (AAMC) (21).

The European Union has established a number of initiatives and directives since 1999 and throughout the years so as to increase the use of telemedicine in Europe. Additionally, telemedicine presents peculiarities and challenges resulting from its own nature, like the use of complex technologies, thus demanding some specific qualifications from the healthcare professional. Many European countries still do not have a regulation regarding telecare, but even if they did, the regulation includes general considerations instead of specific standards of care or competen-

cies. Lastly, they are mostly developed by a professional and scientific association of each country (22). European Telehealth has created the European Code of Practice for Telehealth Services "TeleSCoPE", which mentions the need for an accreditation and a certification for healthcare professionals engaging in telecare (23). Nevertheless, there is no agreement on common competences in the European Union, and each Member State should have its own competences or requirements for telecare delivery (22). Therefore, there is a lack of a standardized telecare competency framework in Europe, especially for chronic diseases.

As part of the "BeEmTel: Beyond the Emergency. Telecare for Non-Communicable Diseases through Simulation Techniques" project, a literature review was conducted and a list of 35 core competencies for the management of chronic patients' needs through telecare was identified. These 35 competencies were grouped in eight main categories, that is clinical knowledge, critical thinking skills, technological skills, clinical skills, communication skills, implementation skills, professionalism and professional ethics, evidence based practice and others (e.g. cultural and social skills). Therefore, healthcare professionals must have a variety of skills in order to meet their chronic patients' needs through telecare practices (24).

Aim

Driven by the above, an e-Delphi study was conducted to recognize core telecare competencies of healthcare professionals for the management of chronic patients as part of the "BeEmTel: Beyond the Emergency. Telecare for Non-Communicable Diseases through Simulation Techniques" project.

Methods

e-Delphi study

The Delphi technique is a research methodology used to achieve consensus concerning real-world knowledge solicited from experts on topics where no agreement previously existed. The Delphi method is based on the assumption that group opinion is more valid than individual opinion (25), describes it as a method to obtain the most reliable possible consensus from a group of experts through a series of questions with controlled feedback, organized in various rounds. At the end of each round, the results are summarized so that they can be evaluated by the expert panel, thus enabling the 'systematic emergence of a concurrence of judgment/opinion' (26). The number of rounds usually ranges between two and four, depending on the complexity of the topic and the time available.

In order to identify and map the skills needed to meet the profile for future health professionals in chronic disease management through telemedicine, the e-Delphi technique was adopted, because it is quicker to implement and ensures higher response rates. The Delphi technique does not use a random sample, but a selected group of experts, defined as a group of informed individuals (27). The inclusion criteria for the panel of experts were: working in a country of Europe, a scientist working directly or indirectly in the care of chronic patients and be willing to participate.

Taking as a starting point, the results of the literature review in which 35 competencies were identified (24), a three-round e-Delphi study was launched on the 16th of May 2022. At the end of each round, the participants gave their opinion on the identified competencies and a consensus was reached. Once the Delphi study participants provided their opinion on the identified competencies, the responses were summarized and redistributed to the panel in the next round. Only those competencies which reached 75% of the agreement were included in the next round. Through a convergence process that identifies points of agreement and disagreement, a consensus was reached.

For the conduction of the e-Delphi study, it wasn't required to obtain an ethical approval. The panel of experts participated voluntarily and the study did not present any potential harm to individuals or patients.

Results

A multidisciplinary panel was formed. Thirty-five (35) European experts in the fields of chronic diseases and telecare (nursing academics, regulatory board members, nursing service directors and experts on chronic diseases) were invited to participate. For this purpose, a template was specifically designed to collect information about the experts. Out of the 35 invited experts on a voluntary basis, 26 of them agreed to participate in all rounds of the e-Delphi study. The panel of experts was derived from five European countries (Romania, Croatia, Germany, Greece and Italy), but were external to the BeEmTel project consortium partners. In fact, to ensure an objective evaluation, none of the experts knew who the other experts were. The formulation of the panel of experts is depicted in Table 1.

Table 1. **Participants of the e-Delphi study**

Country (N)	Profession (N)	Work field (N)
Romania (8)	MD (14)	Clinical (16)
Italy (7)	RN (10)	Academic (6)
Croatia (7)	Biomedical Informatician-Engineering (1)	Clinical/Academic (4)
Greece (3)	Psychologist (1)	
Germany (1)		
Age: 46.8 ±11.2		
Working experience: 21.9 ± 12.3		

MD: Medicine Doctor, RN: Registered Nurse

In the first round, the panel of experts was asked to rate the 35 competencies (Table 2), according to their importance in a 5-point Likert scale where 1 corresponded to not important to 5 that corresponded to very important. The first round of the e-Delphi study ended on the 10th of June 2022. The participants were asked to rate the competencies according to their importance, to rephrase them if needed and to propose any competency which, in their opinion, is needed but wasn't included. The first round gave the following results. The highest value was observed for the competency #27 "Act according to laws, regulations and ethical standards while practicing" with a mean score 4.93 and the lowest values for the competency #10 "Apply knowledge and practices of data management and analysis" with a mean value 3.82.

Table 2. **Core competencies derived from the literature review**

1.	Perform chronic patient observation by using telecare technology.
2.	Apply specialized knowledge related to chronic diseases.
3.	Conduct a thorough and detailed physical examination of the chronic patient in the telehealth environment.
4.	Make shared clinical decisions remotely.
5.	Demonstrate flexibility and open-mindedness to changes in healthcare conditions.
6.	Prioritize patients' needs, integrate and apply advanced knowledge to analyze a patient's condition and proffer the appropriate care and treatment plan from distance.
7.	In-depth knowledge of technical and telecare systems.
8.	Start and complete a telecare session by using and adjusting technical equipment.
9.	The ability to determine and evaluate individual health requirements and state of health via telecare sessions.
10.	Apply knowledge and practices of data management and analysis.
11.	Educate patients on basic digital and computer competency and the proper use of computer hardware telecare equipment and telecare software programs.
12.	Awareness of benefits and limits of telecare provision.
13.	Use mobile health technologies and e-health (online applications and services) in order to enhance the provided health care.
14.	Identify and assess the health status and health needs of chronic patients by interpreting verbal and non-verbal expressions during video conferencing.
15.	Plan, implement and assess personalized-individualized health care to meet the needs of chronic patients by using telecare technology.
16.	Educate and empower chronic patients for self-management and wellness remotely with the use of technology.
17.	Develop prevention plans remotely in order to avoid potential risks for health and safety of chronic patients.

18. Use and apply communication techniques for therapeutic reasons in order to support patients during a telecare session.
19. Develop a collaborative relationship, fostering bonding and gaining patients' trust and cooperation.
20. Provide psychological and emotional support to patients during telecare sessions.
21. Show empathy in order to guarantee a considerate attention to patients through a telecare session.
22. Communicate with patients using nonverbal communication technics in order to ensure effective communication during telecare session.
23. Be able to initiate, maintain and close a conversation in a telecare session in order to draw and provide information related to health information.
24. Apply written standards of healthcare professional environments to document of one's activity.
25. Integrate scientific findings into practice in an evidence-based manner; introduce research findings into decision-making by formulating a specific clinical inquiry in response to a known information need; look for the most relevant evidence to meet that need; examine the evidence that has been retrieved critically; synthesize the evidence into an action plan and assess the consequences of any acts or actions taken.
26. Act according to laws, regulations and ethical standards while practicing.
27. Apply fundamental ethical principles in the context of remote care.
28. Adopt and maintain a professional image, attitude and communication in a telecare session.
29. The awareness of ethical issues and actions arising in providing care remotely.
30. Respect for human dignity, self-determination, informed consent, and patient confidentiality, which are only a few of the moral norms and processes, ethical questions, and obligations unique to healthcare jobs.
31. Apply procedures and techniques that help determine the reliability of information while reducing the risks of decision-making.
32. Present and follow practices, rules and regulations and other health services in order to remotely apply clinical practices.
33. Locate, retrieve and present medical data for the location, identification and recognition of the patient's medical records.
34. Understand and respect different cultural backgrounds and respond effectively and respectfully to them.
35. Collaborate as a team and manage self-management, self-service and understanding skills.

From the initial 35 competencies, eight had to be removed in order to reach the consensus of 75% required by a Delphi study. Furthermore, the panel of experts proposed a list of 34 additional competencies which, after merging similar proposals, led to the creation of a list of 53 competencies that was distributed for evaluation in the second round (Table 3). Taking into consideration the results of the first round, the second round was prepared and launched on the 27th of June 2022. In the second round, the panel of experts was once more asked to rate the list of derived competencies according to the importance in a Likert scale from 1 to 5. The second round ended on the 8th of July 2022.

The second round of the Delphi study resulted in 37 competencies, as shown in Table 4, divided in twelve areas. Again, in this round, the highest value was observed in a competency in the area of professional ethics and it was in the competency "Respect for human dignity, self-determination, informed consent, and patient confidentiality, which are only a few of the moral norms and processes, ethical questions, and obligations unique to healthcare jobs" with a mean value 4.89. On the other hand, the lowest score was observed in the competency "Provide second opinion for chronic patients" with a mean value 3.86.

Finally, the third round was launched on the 19th July of 2022 and ended on the 13th of August 2022. Then, experts were asked to provide their agreement or disagreement on the score of the 37 competencies that resulted from the second round (Table 5). The agreement in all competencies ranged from 92.4 to 100%. From the total of 37 competencies of the third round, the experts agreed at 100% for the score of 22 of them. For the rest of the competencies, the agreement was noted from 92.4% to 96.2%. These percentages are fulfilling the percentage for the consensus of a Delphi study.

Table 3. **List of proposed competencies for the second round**

Macro Area		Competence
Laws/normative/ ethics	1.	Act according to laws, regulations and ethical standards (such as data protection), and apply ethical principles while practicing in the context of remote care.
	2.	Respect for human dignity, self-determination, informed consent, and patient confidentiality, which are only a few of the moral norms and processes, ethical questions, and obligations unique to healthcare jobs.
	3.	The awareness of ethical issues and actions arising in providing care remotely.
	4.	Understand and respect different cultural backgrounds and respond effectively and respectfully to them.
	5.	Coverage for virtual visits by insurance carrier.
	6.	Understand and respect social inequalities.
Multidisciplinary team	7.	Collaborate as a team and manage self-management, self-service and understanding skills.
	8.	Training of the intervention team (health professionals) in an interdepartmental training program for the acquisition of knowledge and common skills regarding monitoring through telemedicine systems.
	9.	Promote multidisciplinary evaluation for telemedicine evaluations of chronic patients.
	10.	Create a "healthcare network" among all professionals involved in patient's care (general practitioner, nurses, caregivers, etc.).
Shared decision-making	11.	Make shared clinical decisions remotely based on shared knowledge, skills and experience.
Education of patient /caregiver	12.	Educate and empower chronic patients for self-management and wellness remotely with the use of technology.
	13.	Perform chronic patient observation by using telecare technology.
	14.	Educate patients and their families on basic digital and computer competency and for the proper use of computer hardware telecare equipment and telecare software programs.
	15.	Educate and empower caregivers to help the patients using telecare services and technologies.
	16.	Apply specific psychoeducation techniques to foster patients' engagement in treatment.
Relationship	17.	Develop a collaborative relationship with patients and their families, creating connection and earning their trust and cooperation.
Assessment/ evaluation	18.	The ability to determine and evaluate individual health requirements and state of health via telecare sessions.
	19.	Adopt and maintain a professional image, attitude and communication in a telecare session.
	20.	Prioritize patients' needs, integrating and applying sophisticated knowledge, skills, and expertise to diagnose a patient's condition and provide appropriate care and treatment from a distance.
	21.	Assess the level of urgency in case of a medical problem registered through telecare devices or session, provide emergency response and raise appropriate alarms.
	22.	Identify and assess the health status and health needs of chronic patients by interpreting data registered through telecare devices and monitors.
	23.	Provide second opinion for chronic patients.
	24.	Provide prescription of medications using telecare programs.
	25.	Understand the meaning of chronic disease for each patient and target the patient's needs accordingly.
	26.	The evaluation of daily needs from a socioeconomic point of view.
	27.	Perform chronic patient observation by using telecare technology.

Planning	28. Plan, implement and assess personalized-individualized health care to meet the needs of chronic patients by using telecare technology.
	29. Guaranteeing a prompt response to patients' needs through a telecare system (according to the severity of the patients' issues).
Knowledge/ability	30. Apply specialized knowledge related to chronic diseases.
	31. Integrate scientific findings into practice in an evidence-based manner; introduce research findings into decision-making by formulating a specific clinical inquiry in response to a known information need; look for the most relevant evidence to meet that need; examine the evidence that has been retrieved critically; synthesize the evidence into an action plan, and assess the consequences of any acts or actions taken.
	32. Demonstrate flexibility and open-mindedness to changes in healthcare conditions.
	33. Knowledge of technical aspects of telecare devices to be able to support the patient in overcoming difficulties with utilization of the monitoring equipment.
	34. Use mobile health technologies and e-health (online applications and services) in order to enhance the provided health care.
	35. Be able to do some basic troubleshooting due to the use of technical equipment.
	36. Know how to choose whether to apply telemedicine services and which services to use according to the need of the patient.
	37. The ability to evaluate the need to change a telecare service into 'in office' service.
	38. Apply up to date guidelines and medical scores when taking medical decisions.
	39. Adherence to protocols and systematic recording of collected information.
	40. The awareness of telemedicine value, capabilities and limitations. Devotion and responsibility so as not to underestimate the value of telemedical sessions.
	41. The application of the quality control assessment methodology implementation principle with the aim of improving the clinical outcomes of telemedicine treatment for patients with chronic diseases.
	42. Take measures that ensure adequate resources for people with chronic diseases (availability and quality of the Internet, computers, smartphones, etc.).
Communication	43. Use and apply communication techniques, specifically adapted to the telehealth context, for therapeutic reasons in order to support patients during a telecare session.
	44. Identify and assess the health status and health needs of chronic patients by interpreting verbal and non-verbal expressions during video conferencing.
	45. Be able to initiate, maintain and close a conversation in a telecare session in order to draw and provide information related to health information.
Risk evaluation	46. Develop prevention plans remotely to avoid potential risks for health and safety of chronic patients.
Psychological and emotional support	47. During telecare sessions, provide psychological and emotional support to patients and their family members.
	48. Through a telecare session, show empathy to ensure careful attention to patients and family members.
	49. Awareness of benefits and limits of telecare provision.
	50. Consider motivation for treatment and the patient's stage of change in order to offer support as needed.
	51. Offer palliative care, including emotional support using telecare systems.
	52. Be aware of the implications of chronic disease as far as caregivers' burden is concerned, and consider the involvement of patients' caregivers.
Family involvement	53. Involve the family in the care process to facilitate communication.

Table 4. **Competencies resulted from the second round and mean values**

	AREAS	MEAN VALUE
	AREA A: Laws/Normative/Ethics	
1.	Respect for human dignity, self-determination, informed consent, and patient confidentiality, which are only a few of the moral norms and processes, ethical questions, and obligations unique to healthcare jobs.	4.89
2.	Act according to laws, regulations and ethical standards (such as data protection), and apply ethical principles while practicing in the context of remote care.	4.85
3.	The awareness of ethical issues and actions arising in providing care remotely.	4.63
4.	Understand and respect different cultural backgrounds and respond effectively and respectfully to them.	4.63
5.	Understand and respect social inequalities.	4.37
	AREA B: Multidisciplinary team	
6.	Collaborate as a team and manage self-management, self-service and understanding skills.	4.63
7.	Training of the intervention team (health professionals) in an interdepartmental training program for the acquisition of knowledge and common skills regarding monitoring through telemedicine systems.	4.44
8.	Create a "healthcare network" among all professionals involved in patient's care (general practitioner, nurses, caregivers, etc.).	4.41
	AREA C: Shared decision-making	
9.	Make shared clinical decisions remotely based on shared knowledge, skills, and experience.	4.37
	AREA D: Education of patient/caregiver	
10.	Educate and empower chronic patients for self-management and wellness remotely with the use of technology.	4.63
11.	Perform chronic patient observation by using telecare technology.	4.30
12.	Educate patients and their families on basic digital and computer competency and for the proper use of computer hardware telecare equipment and telecare software programs.	4.52
13.	Educate and empower caregivers to help the patients using telecare services and technologies.	4.30
	AREA E: Relationship	
14.	Develop a collaborative relationship with patients and their families, creating connection and earning their trust and cooperation.	4.44
	AREA F: Assessment/evaluation	
15.	Assess the level of urgency in case of a medical problem registered through telecare devices or session, provide emergency response and raise appropriate alarms.	4.89
16.	Identify and assess the health status and health needs of chronic patients by interpreting data registered through telecare devices and monitors.	4.67
17.	Prioritize patients' needs, integrating and applying sophisticated knowledge, skills, and expertise to diagnose a patient's condition and provide appropriate care and treatment remotely.	4.63
18.	The ability to determine and evaluate individual health requirements and state of health via telecare sessions.	4.41
19.	Adopt and maintain a professional image, attitude and communication in a telecare session.	4.33
20.	Understand the meaning of the chronic disease for each patient and target the patient's needs accordingly.	4.30
21.	Perform chronic patient observation by using telecare technology.	4.30
	AREA G: Planning	
22.	Guaranteeing a prompt response to patients' needs through a telecare system (according to the severity of the patients' issues).	4.48
23.	Plan, implement and assess personalized-individualized health care to meet the needs of chronic patients by using telecare technology.	4.41

	AREA H: Knowledge/ability	
24.	Apply specialized knowledge related to chronic diseases.	4.44
25.	The awareness of telemedicine value, capabilities and limitations. Devotion and responsibility so as not to underestimate the value of telemedical sessions.	4.44
26.	Use mobile health technologies and e-health (online applications and services) in order to enhance the provided health care.	4.41
27.	Demonstrate flexibility and open-mindedness to changes in healthcare conditions.	4.37
	AREA I: Communication	
28.	Identify and assess the health status and health needs of chronic patients by interpreting verbal and non-verbal expressions during the video conferencing.	4.63
29.	Be able to initiate, maintain and close the conversation in a telecare session in order to draw and provide information related to health information.	4.48
30.	Use and apply communication techniques, specifically adapted to the telehealth context, for therapeutic reasons in order to support patients during a telecare session.	4.44
	AREA J: Risk evaluation	
31.	Develop prevention plans remotely in order to avoid potential risks for health and safety of chronic patients.	4.67
	AREA K: Psychological and emotional support	
32.	During telecare sessions, provide psychological and emotional support to patients and their family members.	4.48
33.	Through a telecare session, show empathy to ensure careful attention to patients and family members.	4.48
34.	Consider motivation for treatment and the patient's stage of change in order to offer support as needed.	4.33
35.	Be aware of the implications of chronic disease as far as caregivers' burden is concerned and consider the involvement of patients' caregivers.	4.33
36.	Offer palliative care, including emotional support using telecare systems.	4.30
	AREA L: Family involvement	
37.	Involve the family in the care process to facilitate communication.	4.41

Discussion

In this study, a total of 37 healthcare professionals' competencies for telecare in the management of chronic patients are established. These competencies focus more on the part of the management with detail and clinical relevance of chronic diseases with the use of telecare, rather than on the simple use and application of telecare services.

Similarly, in 2016, Van Houwelingen et al. conducted a four-round Delphi study for telehealth competencies in nurses working in the Netherlands. There, 32 competencies were identified. The most significant competencies for nurses that provide telehealth were coaching skills, the ability to combine clinical experience with telehealth, communication skills, clinical knowledge, ethical awareness, and a supportive attitude (28). Also, in 2019, Arends et al. developed 22 telehealth provider competencies based on the relevant existing literature for telehealth practitioners. They used these competencies to educate and train nurse practitioner students in telehealth and were mostly associated with operational issues (29). Rutledge et al. (2021) conducted a modified Delphi study to recognize, develop, and assess telehealth competencies for nurses. The researchers used the four P's of telehealth framework, per se, planning, preparing, providing, and performance evaluation. In detail, planning for the implementation of a telehealth program, the process of readying for telehealth implementation, delivering telehealth services, and evaluating the impact and outcomes of the telehealth program (30). There are indeed studies from different countries that have identified skills and competences for healthcare professionals

Table 5. **Results from the third round of the e-Delphi study**

#	Competence	Score	Agree N (%)
1	Respect for human dignity, self-determination, informed consent, and patient confidentiality, which are only a few of the moral norms and processes, ethical questions, and obligations unique to healthcare jobs.	4.89	26 (100%)
2	Assess the level of urgency in case of a medical problem registered through telecare devices or session, provide emergence response and raise appropriate alarms.	4.89	25 (96.2%)
3	Act according to laws, regulations and ethical standards (such as data protection), and apply ethical principles while practicing in the context of remote care.	4.85	26 (100%)
4	Identify and assess the health status and health needs of chronic patients by interpreting data registered through telecare devices and monitors.	4.67	26 (100%)
5	Develop prevention plans remotely to avoid potential risks for health and safety of chronic patients.	4.67	25 (96.2%)
6	The awareness of ethical issues and actions arising in providing care remotely.	4.63	26 (100%)
7	Understand and respect different cultural backgrounds and respond effectively and respectfully to them.	4.63	26 (100%)
8	Collaborate as a team and manage self-management, self-service and understanding skills.	4.63	26 (100%)
9	Educate and empower chronic patients for self-management and wellness remotely with the use of technology.	4.63	26 (100%)
10	Prioritize patients' needs, integrating and applying sophisticated knowledge, skills, and expertise to diagnose a patient's condition and provide the appropriate care and treatment from a distance.	4.63	26 (100%)
11	Identify and assess the health status and health needs of chronic patients by interpreting verbal and non-verbal expressions during video conferencing.	4.63	26 (100%)
12	Educate patients and their families on basic digital and computer competency and for the proper use of computer hardware telecare equipment and telecare software programs.	4.52	26 (100%)
13	Guaranteeing a prompt response to patients' needs through a telecare system (according to the severity of the patients' issues).	4.48	25 (96.2%)
14	Be able to initiate, maintain and close the conversation in a telecare session, in order to draw and provide information related to health information.	4.48	26 (100%)
15	During telecare sessions, provide psychological and emotional support to patients and their family members.	4.48	25 (96.2%)
16	Through a telecare session, show empathy to ensure careful attention to patients and family members.	4.48	25 (96.2%)
17	Training of the intervention team (health professionals) in an interdepartmental training program for the acquisition of knowledge and common skills regarding monitoring through telemedicine systems.	4.44	25 (96.2%)
18	Develop a collaborative relationship with patients and their families, creating connection and earning their trust and cooperation.	4.44	25 (96.2%)
19	Apply specialized knowledge related to chronic diseases.	4.44	25 (96.2%)
20	Awareness of telemedicine value, capabilities and limitations. Devotion and responsibility so as not to underestimate the value of telemedical sessions.	4.44	26 (100%)
21	Use and apply communication techniques, specifically adapted to the telehealth context, for therapeutic reasons in order to support patients during a telecare session.	4.44	26 (100%)
22	Create an "healthcare network" among all professionals involved in patient's care (general practitioner, nurses, caregivers, etc.).	4.41	26 (100%)

23	The ability to determine and evaluate individual health requirements and health status via telecare sessions.	4.41	26 (100%)
24	Plan, implement and assess personalized-individualized health care to meet the needs of chronic patients by using telecare technology.	4.41	26 (100%)
25	Use mobile health technologies and e-health (online applications and services) in order to enhance the provided health care.	4.41	26 (100%)
26	Involve the family in the care process to facilitate communication.	4.41	26 (100%)
27	Understand and respect social inequalities.	4.37	25 (96.2%)
28	Make shared clinical decisions remotely based on shared knowledge, skills, and experience.	4.37	24 (92.4%)
29	Demonstrate flexibility and open-mindedness to changes in healthcare conditions.	4.37	26 (100%)
30	Adopt and maintain a professional image, attitude and communication in a telecare session.	4.33	26 (100%)
31	Consider motivation for treatment and the patient's stage of change to offer support as needed.	4.33	26 (100%)
32	Be aware of the implications of chronic disease as far as caregivers' burden is concerned, and consider the involvement of patients' caregivers.	4.33	26 (100%)
33	Perform chronic patient observation by using telecare technology.	4.30	25 (96.2%)
34	Educate and empower caregivers to help the patients using telecare services and technologies.	4.30	26 (100%)
35	Understand the meaning of the chronic disease for each patient and target the patient's needs accordingly.	4.30	25 (96.2%)
36	Perform chronic patient observation by using telecare technology.	4.30	25 (96.2%)
37	Offer palliative care, including emotional support using telecare systems.	4.30	24 (92.4%)

for telecare of chronic diseases. A recent systematic review grouped the competences as follows: clinical knowledge, critical thinking skills, technological skills, clinical skills, communication skills, implementation skills, professionalism and professional ethics, and evidence-based practice (29).

The Association of American Medical College (AAMC) Telehealth Competencies includes six domains: patient safety and appropriate use of telehealth, access and equity, communication, data collection, technology, ethical practices and legal requirements for telehealth. The ethical part surrounds issues on understanding the federal, state, and local setting practice requirements to meet minimal standards to deliver telecare, maintain patient privacy, prioritizing the patient's interest, and sustaining the professional-patient relationship (21, 31). The results of the present e-Delphi study revealed that ethics in telecare is put first with the competencies "Act according to laws, regulations and ethical standards while practicing" and "Respect for human dignity, self-determination, informed consent, and patient confidentiality, which are only a few of the moral norms and processes, ethical questions, and obligations unique to healthcare jobs" having the highest values. The Telescope code, the European code of practice for telehealth services has a section on ethical principles. This section underlines that having an understanding of the ethical context of telehealth services is a required skill and knowledge of healthcare professionals and that compliance with the ethical principles is mandatory for all telecare services (23).

Furthermore, the aforementioned competencies from AAMC take account of the data collection in telecare provision, which refers to performing examinations or taking clinical history in digital format and putting this information in the care plan (32). Nevertheless, the collected data management and analysis are not included in these competencies and in the present study, the competency "Apply knowledge and practices of data management and analysis" had the lowest value. Common barriers in the use of telecare services by healthcare professionals are barriers related to hardware and software used for data collec-

tion management and analysis as well as the lack of knowledge in using these technology and technology literacy barriers (33).

Additionally, one of the last scored competencies was "Offer palliative care, including emotional support using telecare systems". Palliative care is an approach that helps patients and their families deal with the challenges of a life-threatening illness. Early detection, accurate diagnosis, and treatment of pain and other issues – whether physical, psychological, or spiritual – prevent and alleviate suffering (34). Since palliative care is considered a specialty that puts a great emphasis ńn communication between patients, caregivers, and the healthcare team dealing with difficult situations and advanced care planning, there is a misperception that it cannot provide the same degree of personal contact and empathy by using telecare. However, there are studies, especially in the United Kingdom and the United States of America, that used and evaluated telecare palliative services with positive results for both patients and caregivers. Therefore, a possible explanation of this finding could be the feeling of potential awkwardness of telehealth medium that healthcare professionals feel, and this should be acknowledged in order to provide proper palliative care and support and have both time and space to discuss questions or concerns (35). Although there is growth of telecare services, there remains insufficient evidence regarding the clinical application of telecare in palliative care (36).

Successful development and implementation of telecare services needs the trust of healthcare professionals, patients and caregivers. The European Commission has made this call for such trust to all Member States (23). However, in European countries, there are varying socioeconomic statuses and major differences across and within countries in the way healthcare professionals currently provide telecare especially in chronic diseases. Eventually, much still needs to be done to ensure equal high-quality standards and training of healthcare professionals in the management of chronic diseases through telecare services.

Limitations

Out of the 35 invited experts on a voluntary basis, 26 of them participated in all of the rounds of the e-Delphi study, being unevenly distributed across Europe. So, the results might have been characterized by a stronger influence of the healthcare systems and cultures of Southern European countries.

Recommendations

Recommendations surface from these results. At first, telecare competencies should be included into undergraduate and postgraduate healthcare professionals' curricula in Europe to educate the future generations. Chronic disease management is difficult and complex, so in order to meet the patients' needs and to effectively and sustainably integrate telecare, it is necessary for telecare to be included into the curricula of future healthcare providers (15).

After that, the existing workforce should be trained with continuing education training programs, possibly organized by the scientific or professional associations of each country. Also, healthcare organizations should have a role in supporting their employees in ongoing professional development, engaging in competency integration and telecare practices.

Conclusion

This study's findings are essential for enhancing telecare delivery in European countries in the midst of a digitalizing world. There is a proposed competence framework of 37 competencies across 12 domains that present a basis for training of telecare practices in Europe. This result can help and guide not only the educational process within the BeEmTel project but, if they can communicate properly, it can assist educational organizations that want to train healthcare professionals in chronic patients' care through telecare.

Author contributions

Conceptualization (ECF, MB, EL); Formal Analysis (ECF, IVP, MS, IT); Investigation (ECF, MB, EL); Methodology (ECF, SC, IVP); Software (ECF); Supervision (IVP); Validation (IT, SC, MS, IVP); Writing – Original Draft (ECF, IT); Writing – Review & Editing (IT, SC, MS ECF, EL, MB, IVP).

Conflict of interest

The authors declare no conflicts of interest.

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