National Reports:
Desk Research and
Training Needs Analysis

European Grants International Academy

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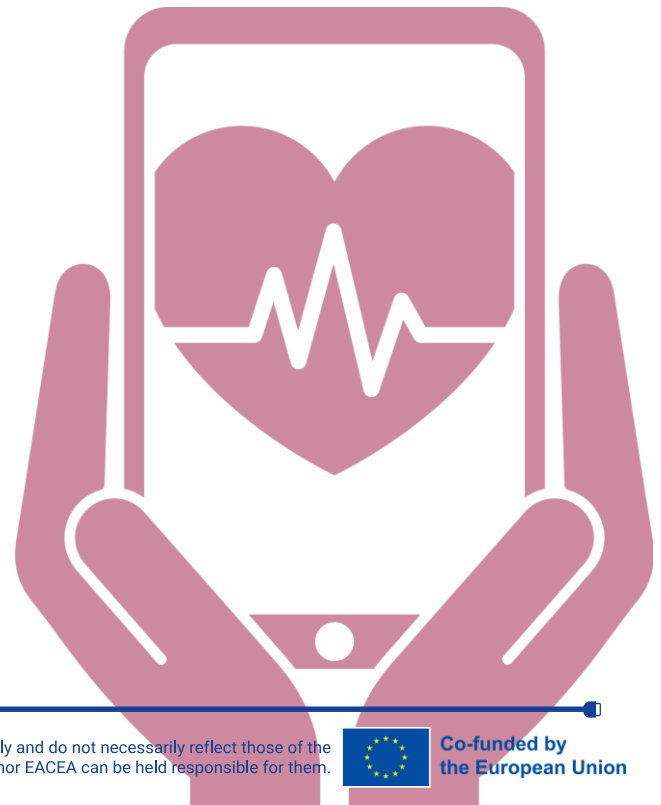
EGInA – Italy

Unit 1

Missing skills and digital gaps, health support needs and required and existing ICT competences

According to various reports and studies, there are several missing skills and digital gaps in the Italian medical system, which can hinder its efficiency and effectiveness. Some of the key issues are:

- Lack of digital infrastructure. The Italian medical system lacks a robust digital infrastructure that can connect various healthcare providers and enable seamless sharing of patient data. This makes it difficult for doctors to access patient records in real-time, leading to delays in diagnosis and treatment.
- Insufficient training in digital skills. Many healthcare providers in Italy lack the necessary skills to effectively use digital tools and technologies, such as electronic health records, telemedicine platforms, and health apps. This can result in poor patient outcomes and reduced efficiency.
- Limited patient engagement. The Italian medical system has been slow to adopt patient engagement tools that can improve patient outcomes and satisfaction. For example, many patients do not have access to health apps or online portals that can help them manage their health and communicate with their healthcare providers.
- Data security concerns. The Italian medical system lacks robust data security protocols to protect patient information from cyber threats. This can lead to breaches and compromises in patient confidentiality, which can erode trust in the healthcare system.
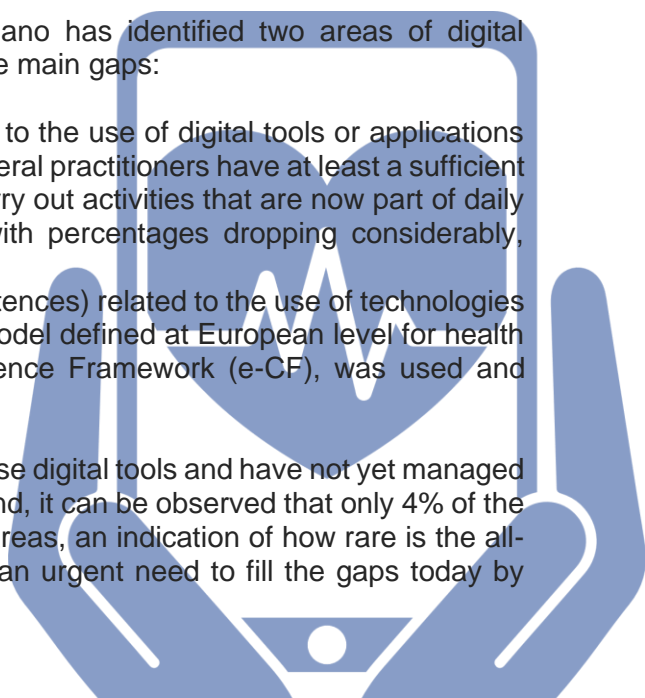
Overall, addressing these missing skills and digital gaps is essential for improving the quality of healthcare in Italy and ensuring that patients receive the best possible care.

As stated in the National Recovery and Resilience Plan, investing not only in technology and organisation, but also in human resources and digital skills development for health workers will be crucial in the coming years. The current level of mastery of basic and professional digital skills is still not sufficient to be able to ride the new trends of digital innovation, with even greater gaps for older doctors.

The Digital Health Observatory of the Politecnico di Milano has identified two areas of digital competence for health professionals, in order to identify the main gaps:

1. Basic digital competences (Digital Literacy) related to the use of digital tools or applications in daily life. About 60 per cent of specialists and general practitioners have at least a sufficient level of competence in the use of digital tools to carry out activities that are now part of daily life (use of chat, video calls, online shopping), with percentages dropping considerably, however, for the over 65s.
2. Digital professional competences (e-Health Competences) related to the use of technologies and applications in the workplace. In this area, a model defined at European level for health professionals, based on the European e-Competence Framework (e-CF), was used and adapted.

On the one hand, it emerges that many doctors still do not use digital tools and have not yet managed to develop the skills associated with them. On the other hand, it can be observed that only 4% of the medical specialists have a satisfactory assessment of all areas, an indication of how rare is the all-round coverage of eHealth competencies. While there is an urgent need to fill the gaps today by

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investing in the continuing education of medical and nursing staff, it is crucial that e-skills development starts earlier in the future. It will be important that, in particular, e-Health competence is developed at university and during specialisation by including topics related to digital health and its correct and appropriate use in the curricula of future health professionals.

Unit 2

Telecare practices, constraints

Telemedicine is widely used in Italy, particularly in remote and rural areas where access to healthcare services may be limited. Patients can consult with healthcare providers via videoconferencing or other remote communication technologies, and receive diagnoses, treatment recommendations, and other medical advice without leaving their homes. In recent years, there has been a growing interest in telecare practices in Italy, driven in part by the aging population and the need to manage chronic diseases. Here are some of the key telecare practices in Italy:
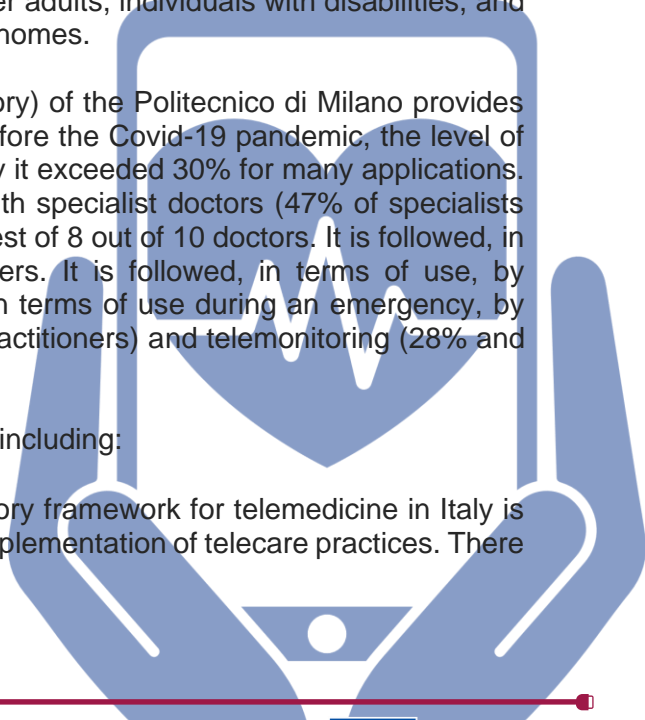
- Remote monitoring. Remote monitoring systems are also common in Italy, particularly for older adults and individuals with chronic health conditions. These systems use sensors and other technologies to track a person's health status and provide alerts to caregivers or healthcare providers if there are any changes in the person's condition.
- Tele-assistance. Tele-assistance services are available to provide assistance to older adults or individuals with disabilities who need help with daily tasks. These services may include remote monitoring, emergency response, and other types of support.
- Tele-rehabilitation. Tele-rehabilitation services are becoming increasingly popular in Italy, particularly for individuals who have undergone surgery or are recovering from an injury. These services use teleconferencing and other technologies to provide rehabilitation therapy and support.
- Telepsychology. Telepsychology services are also available in Italy, allowing individuals to access mental health services from the comfort of their own homes. This can be particularly useful for individuals who live in remote or rural areas, or who have mobility issues that make it difficult to travel to a therapist's office.

Overall, telecare practices in Italy are helping to improve access to healthcare and support services for individuals who might otherwise have difficulty accessing them. These technologies are helping to promote greater independence and quality of life for older adults, individuals with disabilities, and others who may need additional support to remain in their homes.

The Osservatorio Sanità Digitale (Digital Health Observatory) of the Politecnico di Milano provides interesting data to better understand the phenomenon. Before the Covid-19 pandemic, the level of telemedicine use was just over 10%, during the emergency it exceeded 30% for many applications. The most used telemedicine service is teleconsultation with specialist doctors (47% of specialists and 39% of general practitioners), which arouses the interest of 8 out of 10 doctors. It is followed, in terms of use, by teleconsultation with general practitioners. It is followed, in terms of use, by teleconsultation with general practitioners. It is followed, in terms of use during an emergency, by teleconsultation (39% of specialists and 39% of general practitioners) and telemonitoring (28% and 43%).

In Italy, there are several constraints to telecare practices, including:

- Legal and regulatory issues. The legal and regulatory framework for telemedicine in Italy is complex and can be a barrier to the adoption and implementation of telecare practices. There

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is a lack of clear guidelines and regulations on the use of telemedicine, which can result in uncertainty and confusion among healthcare providers and patients.

- Technical infrastructure. The availability and quality of technical infrastructure, such as broadband internet and mobile networks, can also be a constraint to telecare practices in Italy. Some regions or areas may have limited access to reliable internet connections or may not have the necessary equipment to support telemedicine.
- Reimbursement policies. The reimbursement policies for telemedicine services in Italy are not well-defined and can vary depending on the region and the type of service provided. This can make it difficult for healthcare providers to offer telecare services and can limit access to care for patients.
- Resistance to change. There may be resistance to change among healthcare providers and patients who are accustomed to traditional in-person care. This can be a barrier to the adoption and implementation of telecare practices, even if the infrastructure and regulatory framework are in place.
- Privacy concerns. There may be concerns about the privacy and security of patient information when using telemedicine. This can be a barrier to the adoption of telecare practices, as patients may be hesitant to share sensitive information over the internet or other digital channels.

Overall, while telecare practices have the potential to improve access to care and increase efficiency in the Italian healthcare system, there are several constraints that must be addressed to ensure their widespread adoption and success.

Unit 3

Medical systems in the partner countries

Italy has a public healthcare system called Servizio Sanitario Nazionale (SSN) that provides universal coverage to all citizens and legal residents. The system is primarily funded by taxes, and the government sets the budget for the system each year. Under the SSN, patients have access to a wide range of medical services, including primary care, specialist care, hospitalization, and emergency services. The system also covers prescription medications, diagnostic tests, and medical devices. Healthcare in Italy is decentralized, with each region responsible for managing its own healthcare system. This can result in some variation in the quality and availability of services across different regions. However, overall, the healthcare system in Italy is well-regarded, and the country has a high life expectancy and a low infant mortality rate compared to many other countries. In addition to the public healthcare system, there is also a private healthcare sector in Italy. Private healthcare is available to those who can afford it, but it is generally not covered by the SSN. Private healthcare facilities may offer faster access to medical services and more amenities than public hospitals, but they can be expensive.

The pandemic has put the resilience of Italy's health system to a hard test and has required the spending of large resources to cope with the emergency situation. Besides, the long-term effects are not yet known. The pandemic has also exposed some structural problems which characterise Italy's health system and have also been recognised by the National Recovery and Resilience Plan, such as the unequal access to health services at a socio-economic and geographical level, the reduced integration between hospital and territorial services and the long waiting lists for access to some health services. The pandemic has further highlighted that a sustainable, resilient and equitable health system cannot disregard the need to rethink the care system through the appropriate use of digital technologies, which can make processes and services more efficient and be shaped by citizens'/patients' needs, as well as by the characteristics of health professionals. The Italian government took drastic measures to contain the spread of the virus, including a nationwide

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lockdown, social distancing measures, and the closure of non-essential businesses. These measures helped to slow the spread of the virus and reduce the burden on the country's medical systems. Despite the challenges, Italy's medical systems demonstrated remarkable resilience during the pandemic. Healthcare professionals worked tirelessly to provide care to Covid-19 patients, often risking their own health in the process. Hospitals and healthcare facilities were adapted to accommodate the surge in patients, and medical equipment and supplies were sourced from around the world to address shortages.
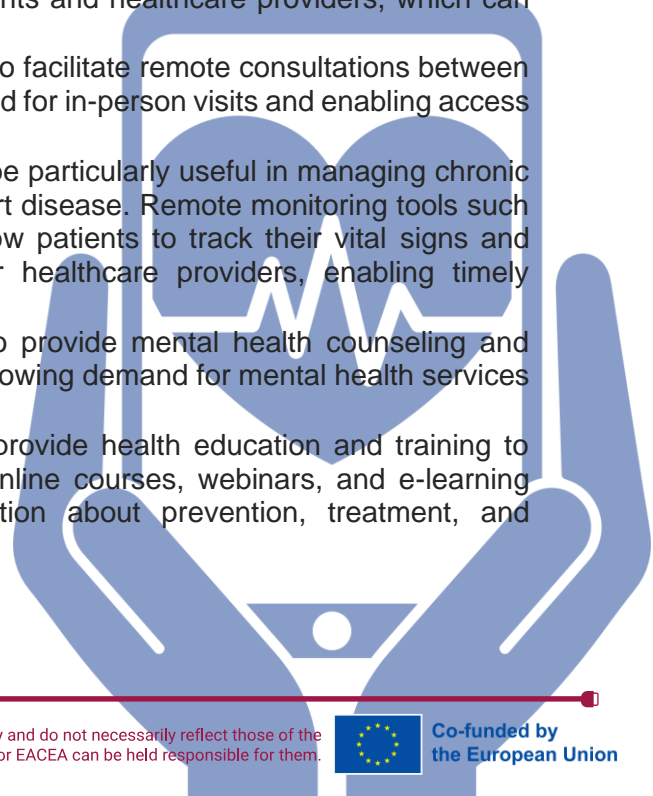
Looking to the future, Italy's medical systems are likely to continue to be impacted by the pandemic. The country's healthcare infrastructure may need to be further strengthened to better prepare for future pandemics and other public health emergencies. Investment in medical research, technology, and innovation will also be critical to improving the country's medical systems and providing better care to patients.

Unit 4

Opportunities

Telemedicine is a rapidly growing field in Italy, and there are many opportunities for healthcare providers and entrepreneurs to leverage technology to improve healthcare delivery. Here are some key areas of opportunity:

- Improved access to care. Telemedicine allows patients in remote or underserved areas to receive medical care without the need for travel. This can be especially important for people with chronic conditions who need regular check-ups or monitoring.
- Cost savings. Telemedicine can reduce the cost of healthcare for both patients and healthcare providers. For patients, telemedicine eliminates the need for transportation, parking, and time off work. For healthcare providers, telemedicine can reduce overhead costs associated with running a physical office.
- Increased efficiency. Telemedicine can streamline the healthcare process by eliminating paperwork and reducing wait times. It can also help healthcare providers manage their time more efficiently by allowing them to see more patients in less time.
- Better patient engagement. Telemedicine allows patients to receive care in a more convenient and comfortable setting, which can increase patient engagement and satisfaction. It can also facilitate communication between patients and healthcare providers, which can lead to better health outcomes.
- Remote consultations: Telemedicine can be used to facilitate remote consultations between patients and healthcare providers, reducing the need for in-person visits and enabling access to care for patients in rural or remote areas.
- Chronic disease management. Telemedicine can be particularly useful in managing chronic diseases such as diabetes, hypertension, and heart disease. Remote monitoring tools such as wearables, sensors, and mobile apps can allow patients to track their vital signs and symptoms and share this information with their healthcare providers, enabling timely interventions and better outcomes.
- Mental health. Telemedicine can also be used to provide mental health counseling and therapy, which is particularly important given the growing demand for mental health services in Italy.
- Health education. Telemedicine can be used to provide health education and training to patients, caregivers, and healthcare providers. Online courses, webinars, and e-learning modules can be used to disseminate information about prevention, treatment, and management of diseases.

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- Second opinion services. Telemedicine can also be used to provide second opinion services, allowing patients to get a consultation from a specialist without having to travel long distances.

Overall, telemedicine offers many opportunities for improving healthcare delivery and outcomes. However, it is important to ensure that telemedicine services are delivered in a way that is safe, secure, and effective, and that they meet the needs of both patients and healthcare providers.

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ENC – Belgium

Unit 1

Missing skills and digital gaps, health support needs and required and existing ICT competences

Prior to the pandemic, eHealth was not yet fully integrated in Belgian healthcare. Some important barriers remained that might explain the low level of adoption and implementation. Access to digital technologies and digital skills are important preconditions for the use of eHealth. Vulnerable populations are most at risk of digital exclusion and less likely to benefit from the advantages of eHealth. Also, healthcare workers feel insufficiently trained to cope with the demands and challenges of an increasingly digitalized healthcare sector.

Health literacy is required to understand and use health-related information to improve health and wellbeing. However, one in three Belgian citizens do not possess the required level of health literacy to make decisions regarding their health and wellbeing.

Both citizens and healthcare workers were concerned that the increased digitalization of healthcare might lead to a healthcare system at two speeds. People who possess the necessary resources, skills and motivation can take an active role in managing their health and wellbeing, whereas others might be left out and denied access to healthcare. Several healthcare workers were also worried about healthcare workers who do not possess the required digital skills to make optimal use of eHealth. Therefore, the major question regarding the future of eHealth in the post-corona era is not whether eHealth will become an integral part of Belgian healthcare, but rather if the country is ready for the digital revolution in healthcare and who is at risk of being excluded from the benefits of it or, even more problematic, from healthcare in general.

There is a clear gap between the potential of eHealth and its actual adoption and implementation in healthcare. For healthcare workers, these include: the lack of information on eHealth services, the lack of interoperability between the different eHealth services and applications, poor user friendliness, technical issues, the lack of renumeration for the use of eHealth. Other barriers for the use of eHealth are the complex eHealth landscape, the lack of a clear overview of personal health data available for online consultation, poor user-friendliness, technical issues, problems with the availability and completeness of personal health data.

During the corona pandemic, the Belgian government tried to overcome some of these challenges, (e.g., by agreeing on the reimbursement of teleconsults and by informing citizens how to consult their test results online). Nevertheless, one of the most important barriers to the adoption and implementation of eHealth remains, namely that the use of eHealth requires specific resources and competences.

According to the Barometer Digitale Inclusie, 40% of the Belgian population is at risk for digital exclusion, either because they cannot use or access the internet (8%) or because they lack the skills to make optimal use of digital technologies (32%). Three out of four people with a monthly income below 1200 € and low education level risk to be left behind by increasing digitalization. Access to digital technologies and skills, however, is not enough to benefit from eHealth. People must also be able to interpret the personal health information and data they are viewing or measuring. That's where health literacy comes in. In Belgium, one in three citizens aged 15 years and older do not possess the necessary skills to make decisions regarding their health and wellbeing. Especially women, older people, people with a low education level and those with poor health have a low health literacy.
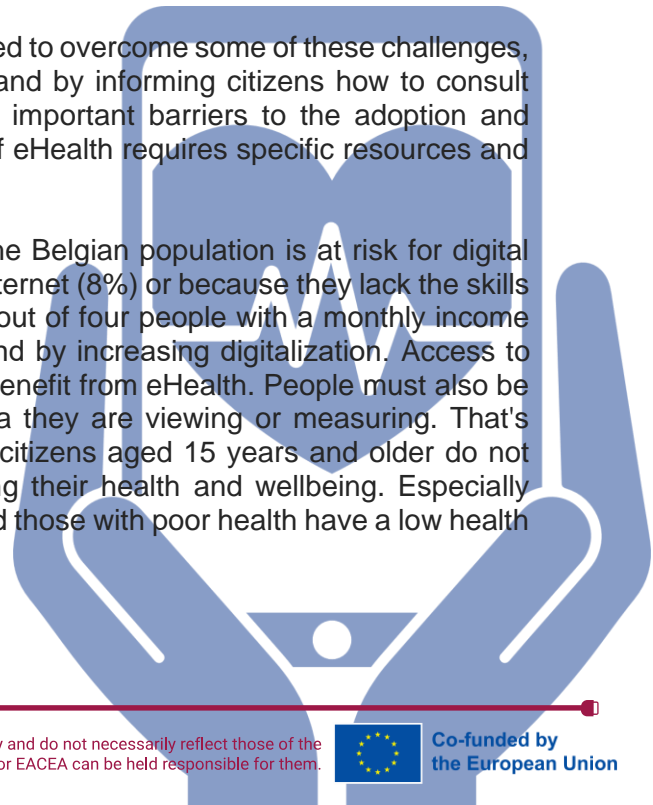
Results from the eHealthmonitor 2019 indicated that 83% of Belgian citizens would like access to a website, validated by healthcare professionals, to help them understand their personal health data. Also, during the focus group interviews citizens mentioned that the data that is available for online consultation is not always understandable.

Unit 2

Telecare practices, constraints

Over 60% of nursing assistants and more than 40% of nurses uses digital monitoring techniques (e.g. movement sensors, a personal alarm, an interactive buzzer system, electronic bed pads, video and/or audio surveillance). Only a minority uses telemonitoring, an electronic drug dispenser, video calling or a care robot.

About one in three citizens uses one of the official national or regional health portals (Mijngezondheid/Masanté, MyHealthViewer, CoZo, Brussels Gezondheidsnetwerk/Réseau Santé Bruxellois, Réseau Santé Wallon) to consult the personal health data that is available to them.

The potential of easy and fast information transfer between healthcare professionals is threatened by a lack of ergonomics (e.g. error messages, unreadable documents, non-functioning links, high number of clicks) and interoperability (e.g. no integration in General Practitioner's (GP) software package), structural problems related to the architecture of the eHealth system, crashes of the system, information overload and difficulties implementing Evidence Based Practice (e.g. decision aids, alerts).

These problems and inconveniences involve loss of time or a time investment not outweighed by potential benefits of eHealth. Time lost by a malfunctioning of the eHealth system is time that cannot be spent on patient care. This means income loss for the GPs and less quality of care of patients. In addition GPs fear data loss caused by failures of the eHealth system. Finally, costs of software installation and maintenance add up to the list of disadvantages or problems.

Time loss, the perceived threat of data loss and installation costs bring about a lot of frustration and undermine GPs' motivation and trust in the eHealth system, as well as trust in their own capabilities to handle eHealth and the troubleshooting that comes with it.
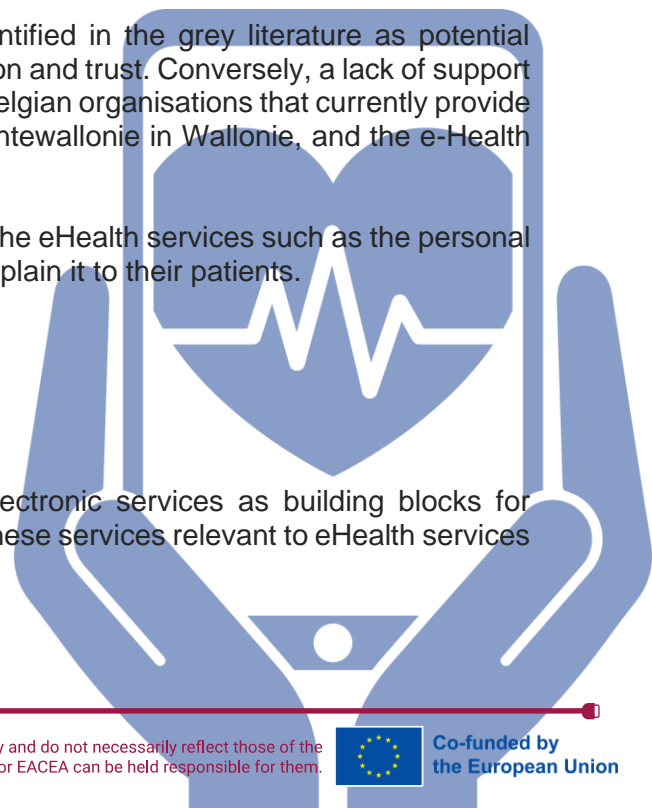
Support (e.g. helpdesk, hotline) and training were identified in the grey literature as potential facilitators of eHealth uptake mitigating the lack of motivation and trust. Conversely, a lack of support was not reported as a barrier in the retrieved documents. Belgian organisations that currently provide support are, amongst others, éénlijn.bej in Flanders, e-santewallonie in Wallonie, and the e-Health Academy in Brussels.

Finally, we also noted that patients are not familiar with the eHealth services such as the personal health viewer, which means GPs need to spend time to explain it to their patients.

Unit 3

Medical systems in the partner countries

The eHealth-platform has developed several basic electronic services as building blocks for further applications. This section provides an overview of these services relevant to eHealth services for GPs, without going into too much technical detail.

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The **eHealth certificate** is a digital document used to authenticate and authorise a system. The eHealth certificate allows a computer system to authenticate itself as a system used by a healthcare providers, or by a licensed organisation. The eHealth certificate allows software programs like EPD software to connect to eHealth-platform services and obtain appropriate authorisation for the user. It is similar in nature to for example the eIDa which can be used to authenticate a user rather than a system.

Authentication and authorisation is an important service provided by the eHealth-platform. It is a trusted way to verify the identity of the partners in the information exchange (authentication) and to verify they have sufficient rights to use the requested service (authorisation).

End-to-end encryption service. The end-to-end encryption (ETEE) service allows to encrypt messages for healthcare professionals or institutions.

Timestamp service. A trusted timestamp allows to prove a document existed with a certain content at a certain moment in time. The timestamp is tamper-proof. The eHealth-platform offers both the creation of timestamps as well as the consultation of a timestamp that is temporarily stored at the eHealth-platform.

Recip-e – Electronic prescriptions. Recip-e is a system for physicians, dentists, and midwives that aims to replace paper prescriptions of pharmaceutical products, physiotherapy and nursing by electronic prescriptions. Recip-e is compulsory for prescriptions of pharmaceutical products, except during visits and in emergencies. Prescriptions of physiotherapy and nursing are in test phase.

MyCareNet, an electronic platform for information exchange between healthcare professionals and organisations, and the (public) health insurance funds.

Unit 4

Opportunities

Solutions to the problems described above could be the interoperability between systems, as well as the need on information to be complete and coded in a standardised way, available in a multidisciplinary electronic health record. The proliferation of international open standards for healthcare information (like HL7, FHIR and SNOMED CT) should be encouraged and governed by a central organisation or structure. Incorporation of decision aids that support evidence based practice was seen as a needed future feature of current Electronic Patient Dossier software packages. Other key ideas or opportunities could be the following:

Present a comprehensive and extensive roadmap eHealth for a stepwise implementation. Some GPs seem to feel overwhelmed by the number of eHealth services and tools. There is a need for prioritisation and agenda setting. GPs ask a stepwise implementation and a well-developed and extensive implementation plan, including training initiatives and information campaigns.

Investing in the quality of services rather than in the number. GPs recommend in addition, not to launch an application prematurely, but only if is ready and well tested. GPs ask to invest in the quality of existing services, rather than in developing new ones.

User involvement in priority setting and application development. GPs prefer to be more involved in priority setting and development of eHealth services. Priority setting means that the eHealth agenda should be needs-driven. In other words, GPs would like to be consulted to determine what kind of services are needed or would be a real added value in general practice. From the GPs

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accounts it seems that this kind of bottom-up approach is currently lacking. GPs also claimed that they can have a useful input in the development of services. They suggest a co-creation process between GPs and software developers enabling the combination of their practical knowledge on how to run a general practice and IT development competences of software developers. GPs also invite software developers to observe a number of consultations to gain insight in the daily practice of a GPs' work.

Develop and accredit trainings and continuous support for GPs. GPs insist on the role of training to promote eHealth services use. Although the basics should be included in the curriculum of medical training, also other formats are needed to enable continuous learning. This way each GP can choose the most suited formula, depending on his/her needs and available time. Formats mentioned are individual and group information sessions and short webinars. Accreditation of trainings might convince GPs to participate.

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G&G Huisartsenpraktijk Oranjeboom – Netherlands

Unit 1

Missing skills and digital gaps, health support needs and required and existing ICT competences

There are four projects carried out on this subject in the Netherlands. They are: "Telemedicine for Mental Health", "Connected Care", "My Care", "Telemonitoring of Elderly". The Telemedicine for Mental Health project was launched in 2019 by the Dutch government. The project aims to provide access to mental health services to those in remote areas or with limited access to healthcare. This is done by connecting mental health professionals to patients using digital technologies, such as video conferencing and telehealth services. Additionally, the project provides access to digital services, such as online appointment booking, digital mental health records, and telehealth services. By utilizing this technology, healthcare providers in the Netherlands can ensure that patients receive the necessary mental health services in a timely and effective manner. Connected Care is a project that was launched by the Dutch government in 2017. The project aims to make it easier for patients to access care and healthcare services. This is done by creating a network of connected healthcare organizations, such as hospitals, clinics, and pharmacies, that are linked together using digital technologies. This allows for better communication between healthcare providers and improved coordination of care. Additionally, the Connected Care project provides access to digital services, such as online appointment booking, digital medical records, and telehealth services. My Care is a project that was launched in the Netherlands in 2019. It is the world's first large-scale telehealth project and provides personalized support for patients with chronic illnesses. This is done by connecting healthcare professionals to patients using digital technologies, such as video conferencing and telehealth services. The Telemonitoring of Elderly project was launched in 2020 by the Dutch government. The project aims to provide elderly people with access to remote care and support. This is done by connecting healthcare professionals to patients using digital technologies, such as video conferencing and telehealth services. Additionally, the project provides access to digital services, such as online appointment booking, digital medical records, and telehealth services. Additionally, the project also provides access to remote monitoring services, such as sensors and wearable devices, which allow healthcare professionals to track a patient's vital signs and other health information remotely. Additionally, the project also provides access to virtual care services, such as virtual house calls, virtual care plans, and virtual support groups.

Unit 2

Telecare practices, constraints

One of the missing skills on telecare systems is user training. While telecare systems are designed to be user-friendly, they can still require some amount of training for users to be comfortable using the technology. This training can include topics such as how to operate the system, how to access remote services, how to use automated medication dispensers, and how to use fall detection systems. Ensuring that users are adequately trained on the system is an important part of ensuring that the system is used effectively and safely.

The Covid-19 pandemic has had a significant impact on the development of telecare systems. The rapid spread of the virus has highlighted the need for technology-enabled care, as it can help to reduce the risk of transmission by allowing people to receive care in their own homes. The increased demand for telecare systems has led to the development of new technologies and services, such as remote monitoring systems, automated medication dispensers, and access to telehealth or

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telemedicine services. Additionally, telecare systems can also be used to monitor health vitals, track activity, and provide reminders for medications or other tasks. Furthermore, telecare systems can provide reassurance to family members and carers, who may be worried about the health and wellbeing of their loved one. In order to fight the direct impact of COVID-19, it is essential to keep clinical services operational. However, many countries have had to reduce or even suspend many clinical services, including cancelling or postponing medical appointments and elective surgeries. These strategies cannot be sustained indefinitely, as many patients have comorbidities like hypertension, cardiopathies, chronic respiratory diseases, and diabetes, which are proven risk factors for severe forms of COVID-19 and need to be controlled. Telemedicine can help to ensure that these patients receive the care they need, without having to attend hospitals or health services in person.

Telecare systems can be used to monitor dialysis patients remotely. These systems can track a patient's vital signs, including blood pressure and heart rate, as well as other important health information, such as blood sugar levels. This information can be monitored remotely by healthcare professionals, allowing them to intervene if necessary. Additionally, telecare systems can be used to remind patients to take their medications, which can be critical in managing dialysis treatments. Finally, telecare systems can be used to connect dialysis patients with their healthcare providers, allowing for remote consultations and follow-up visits.

Dialysis patients can benefit greatly from telecare systems. These systems can track a patient's vital signs, allowing healthcare professionals to intervene if necessary. For example, if a patient's blood pressure or heart rate start to rise unexpectedly, healthcare professionals can be alerted immediately and intervene if necessary. Additionally, telecare systems can be used to remind patients to take their medications, which can be critical in managing dialysis treatments. This is especially important for patients who may forget to take their medications or who take them at incorrect intervals. Finally, telecare systems can be used to connect dialysis patients with their healthcare providers, allowing for remote consultations and follow-up visits. This can be beneficial for patients who live in remote areas or who have difficulty traveling to their healthcare provider.
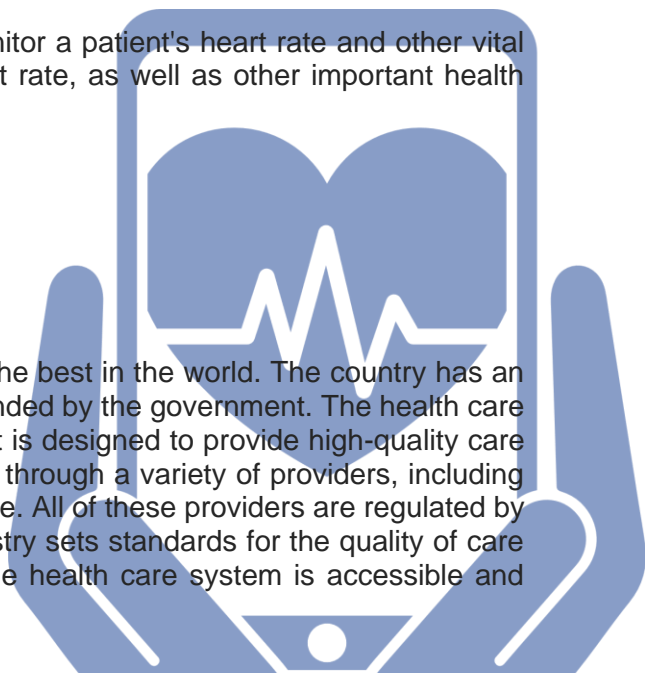
Diabetes patients can benefit greatly from telecare systems. These systems can track a patient's vital signs, allowing healthcare professionals to intervene if necessary. For example, if a patient's blood sugar levels start to rise unexpectedly, healthcare professionals can be alerted immediately and intervene if necessary. Additionally, telecare systems can be used to remind patients to take their medications, which can be critical in managing diabetes. This is especially important for patients who may forget to take their medications or who take them at incorrect intervals.

Telecare systems can be used with heart batteries to monitor a patient's heart rate and other vital signs remotely. These systems can track a patient's heart rate, as well as other important health information, such as blood pressure and oxygen levels.

Unit 3

Medical systems in the partner countries

Healthcare in the Netherlands is considered to be one of the best in the world. The country has an extensive system of public health care services that are funded by the government. The health care system is based on the principle of universal access and it is designed to provide high-quality care for all citizens. In the Netherlands, health care is provided through a variety of providers, including general practitioners, hospitals, pharmacies, and home care. All of these providers are regulated by the Dutch Ministry of Health, Welfare and Sport. The Ministry sets standards for the quality of care that is provided, and it is responsible for ensuring that the health care system is accessible and

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affordable for everyone. All citizens of the Netherlands are covered by the public health care system, and those who are not eligible for public coverage can purchase private health insurance. The health care system in the Netherlands is designed to be equitable and effective. It ensures that all citizens have access to quality care regardless of their economic or social status. The system also emphasizes preventive care, which helps reduce the costs associated with treating illnesses and chronic conditions. The system is also designed to provide individuals with the resources and support they need to lead healthy lives. The Netherlands has a variety of programs and initiatives aimedx at promoting healthy lifestyles, such as promoting physical activity and providing access to nutritious food. The country also has a strong focus on mental health care, which is important for maintaining optimal mental and physical wellbeing. Overall, the health care system in the Netherlands is one of the best in the world. It is designed to provide high-quality care to all citizens, while also promoting preventive measures and healthy lifestyles. This system is a model for other countries, and it is an example of how a well-designed healthcare system can provide equitable and effective care for all citizens.
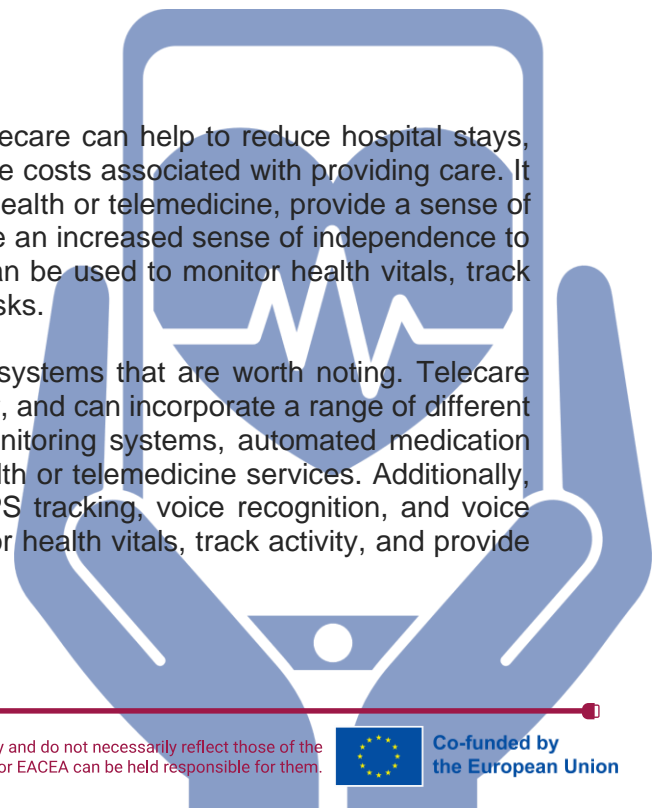
Nurses play a vital role in the healthcare system in the Netherlands. Nurses are responsible for providing direct patient care and they act as the primary point of contact between patients and other healthcare professionals. They provide a wide range of services, including administering medications, diagnosing illnesses, and educating patients on how to manage their health. In the Netherlands, nurses are regulated by the Dutch Nursing Act and the Dutch Nursing Code of Conduct. These laws ensure that nurses are adequately trained and skilled to provide quality care to their patients. Nurses must complete a three-year Bachelor's degree in nursing and pass a licensing exam in order to practice. Nurses in the Netherlands provide comprehensive care to their patients. They are responsible for assessing patients' medical needs, providing treatments and medications, and educating patients about their health. Nurses also collaborate with other healthcare professionals, such as doctors, to ensure the best possible care for their patients. Nurses play a key role in promoting preventive care in the Netherlands. They work to educate patients about healthy lifestyle choices, such as proper nutrition and exercise, and they help patients manage chronic conditions. Nurses also monitor patients' progress and provide emotional support to help them cope with illnesses and treatments. Nurses in the Netherlands are an essential component of the healthcare system. They are highly trained and skilled professionals who provide comprehensive care to their patients. Nurses are dedicated to promoting preventive care and helping patients lead healthy lives. They play a vital role in ensuring that the healthcare system in the Netherlands is effective and accessible for all citizens.

Unit 4

Opportunities

The opportunities of telecare systems are numerous. Telecare can help to reduce hospital stays, reduce the need for long-term care, and help to reduce the costs associated with providing care. It can also provide access to medical services such as telehealth or telemedicine, provide a sense of safety and security to users and their families, and provide an increased sense of independence to those using the system. Additionally, telecare systems can be used to monitor health vitals, track activity, and provide reminders for medications or other tasks.

There are a number of other details related to telecare systems that are worth noting. Telecare systems can be tailored to the needs of the individual user, and can incorporate a range of different technologies and services. They can include remote monitoring systems, automated medication dispensers, fall detection systems, and access to telehealth or telemedicine services. Additionally, telecare systems can include other features such as GPS tracking, voice recognition, and voice commands. Telecare systems can also be used to monitor health vitals, track activity, and provide medication and task reminders.

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In the field of health communications and education, telehealth has a potential application in the use of screening and orientation systems based on artificial intelligence. These systems have the potential to reduce the clinical load of physicians, allowing them to focus on more complex cases. An on-line medical "chat bot" can be used to detect early symptoms in patients, and refer them for medical treatment if their condition worsens. When certain conditions are identified, a professional can enter the conversation and interact with the individual, providing explanations and better orientation.

A central strategy for controlling disease outbreaks is "direct triage", which involves classifying patients before they reach the health services in person. Telemedicine can be used to keep asymptomatic individuals or mild cases at home, while the more serious cases are referred to hospitals. This helps to gain time and avoid overload on health services. On-line contacts or telephone-based software programs can be used to detect and record patients' data, such as symptoms or temperature, which can help to prevent unnecessary hospital consultations for patients with mild symptoms. Depending on the severity of the symptoms, users can be referred to contact a physician, who can instruct them to go directly to the hospital, remain at home and monitor their symptoms, or take other appropriate steps for the situation.

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Pro Arbeit - Germany

Unit 1

Missing skills and digital gaps, health support needs and required and existing ICT competences

Unit 2

Telecare practices, constraints

- the establishment of secure networking in the healthcare sector (telematics infrastructure, TI)
- the use of the electronic health card (eGK) with its applications
- the use of the electronic patient file (ePA) and the electronic prescription (e-prescription)
- a new range of digital health applications (DiGA) and digital care applications (DiPA) for insured persons
- the expansion of the possibilities for using video consultation hours and further services in telemedicine
- the newly established National Health Portal provides citizens in Germany with scientifically based, neutral and easy-to-understand information on selected health topics, clinical pictures and treatment options
- in a European context, Germany is far behind, struggling with implementation hurdles, such as numerous isolated solutions that make cross-sector networking difficult.
- citizens fear the loss of their data sovereignty, the issue of data protection is of particular importance, and uniform and secure regulations must be created.
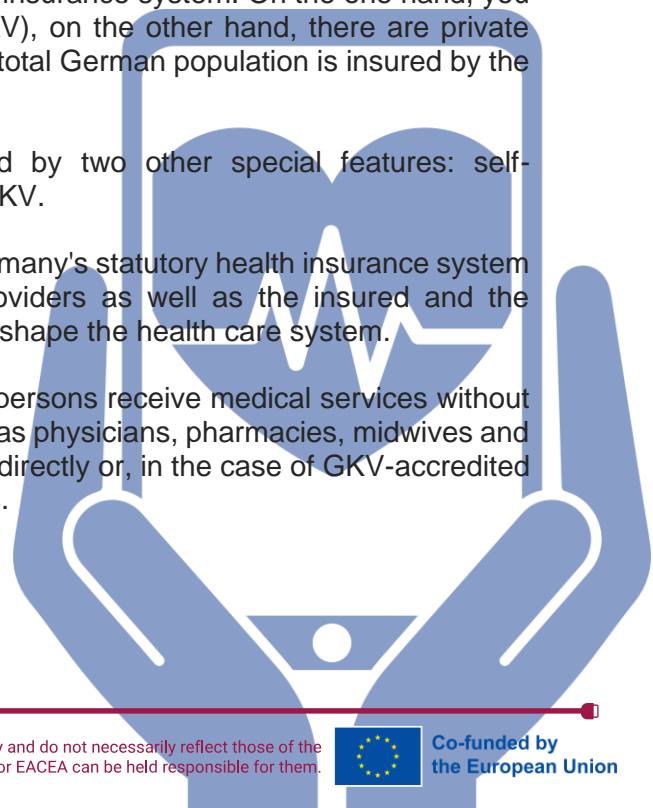
Unit 3

Medical systems in the partner countries

The German health care system is a so-called dual health insurance system. On the one hand, you can insure yourself in the statutory health insurance (GKV), on the other hand, there are private health insurances (PKV). Approximately 85 percent of the total German population is insured by the statutory health insurance.

The German health care system is also characterized by two other special features: self-administration and the principle of benefits in kind in the GKV.

Self-governance is the main organizational principle in Germany's statutory health insurance system (GKV). Self-governance means that the health care providers as well as the insured and the employers organize themselves in order to steer and help shape the health care system.

The principle of benefits in kind means that GKV-insured persons receive medical services without having to pay for them in advance. Service providers such as physicians, pharmacies, midwives and other health care providers bill the health insurance funds directly or, in the case of GKV-accredited physicians, the associations of GKV-accredited physicians.

Unit 4

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Opportunities

- faster communication and more efficient administrative processes
- the abolition of fax messages and paper forms
- the provision of patient data whenever and wherever it is needed as a prerequisite for good and effective treatment
- the systematic analysis of medical data improves the detection of diseases, enables individually targeted therapies and opens up new healing opportunities
- the use of mobile applications holds new opportunities for a self-determined role of patients in the treatment process and for strengthening health literacy
- digital technologies help in better addressing the challenges facing almost all healthcare systems in the Western world - treating more and more elderly and chronically ill people, paying for expensive medical innovations, continuing to provide good medical care to structurally weak rural areas.
- help to counter the shortage of skilled workers, reducing for example administrative tasks and documentation, but also assisting in diagnostics and everyday practical activities.

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SYSTSERV – Greece

Unit 1

Missing skills and digital gaps, health support needs and required and existing ICT competences

1.1 Telenursing in Greece. History up to now.
The digital health sector, Greece continues to lag behind other European Union countries in digital transformation infrastructure. According to a study by the Foundation for Economic and Industrial Research (IOBE) on digital health and real-world data, Greece is ranked 26th among the countries of the EU in terms of the use of electronic health records and is 25th in the exchange of clinical data electronically[1]. However, its performance in telemedicine is better, where it ranks eighth.
On the issue of "e-Health", the Greek Ministry of Health (MoH) website refers to the definitions used by the World Health Organization (WHO): "[...] the efficient and safe use of [ICTs] in support of health and health-related fields, including healthcare, monitoring and treatment, research and knowledge"[2]. In Greece, the adoption of digital healthcare infrastructure will be a key component in ensuring access to health care services in isolated geographical areas. An effective deployment of telehealth technologies will enhance the ability to better meet the healthcare needs of those in rural and frontier parts of the country.

However, there is currently no regulatory framework on telehealth and, as a result, issues such as data privacy, security or medical liability remain to be addressed and the ways to address them are still unclear.

Telehealth and Virtual Hospitals/Virtual Visits. In virtual hospitals, patients are connected with healthcare professionals remotely (via video or other technologies) in real-time for consultation on medical issues. Similarly, a virtual visit is the capability to consult with a doctor through a smartphone, tablet or computer, whether from home or work, without the need for an in-person appointment, regardless of the time of day.

Telehealth and Remote Healthcare. Constant monitoring of the patient's condition and performance of medical examinations away from medical facilities is described as remote medical care. This form of healthcare is performed with the use of specific technologies (such as mobile devices, wearables, sensors) to facilitate interaction between clinicians and patients at home[3].

1.2 Identified missing skills
Evidence from the literature suggests that undergraduate nursing programmes do not adequately prepare nursing students to be practice-ready on completion of their nursing courses[4].
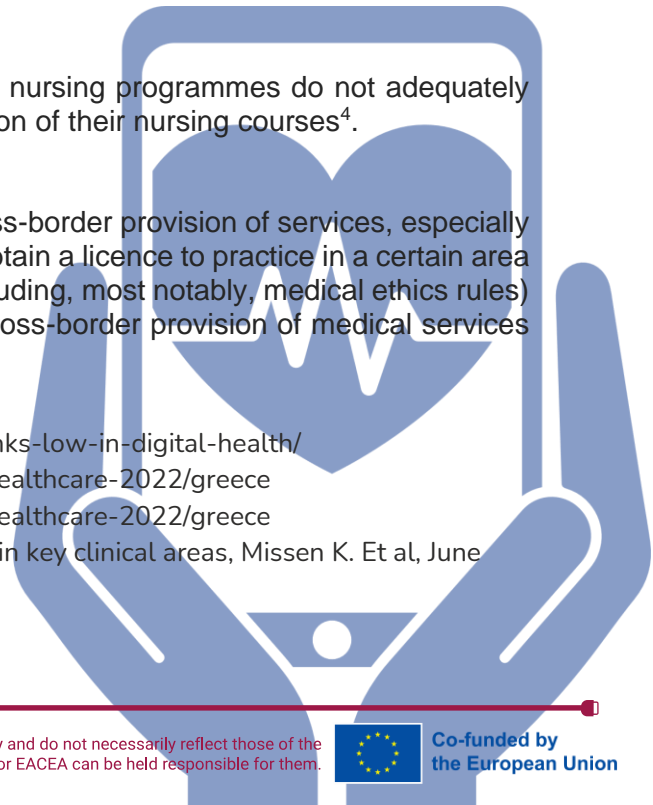
1.3 Identified missing gaps
Notwithstanding, the use of telehealth raises issues of cross-border provision of services, especially regarding licensing and authorisation. Doctors generally obtain a licence to practice in a certain area and are subject to the legislation and rules of conduct (including, most notably, medical ethics rules) of that area. The main liability considerations regarding cross-border provision of medical services include:

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[1] https://www.ekathimerini.com/news/1179739/greece-still-ranks-low-in-digital-health/

[2] https://practiceguides.chambers.com/practice-guides/digital-healthcare-2022/greece

[3] https://practiceguides.chambers.com/practice-guides/digital-healthcare-2022/greece

[4] Qualified nurses' rate new nursing graduates as lacking skills in key clinical areas, Missen K. Et al, June 2016Journal of Clinical Nursing 25(15)

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- patient rights;
- product liability;
- jurisdictional issues; and
- personal data.

1.4 What are the real needs
Nursing in a digital age requires integration of information technology (IT) into the larger body of knowledge in nursing and in addition training the student nurses to adapt to an IT-rich work environment[5]. In fact, the adoption of digital solutions is necessary to contribute to the new digital-based models of care[6]entering the healthcare sector globally.

1.5 Existing ICT competences

These systems support data transmission over simple phone lines, internet connections, integrated services digital network/digital subscriber lines, satellite links, mobile networks (GPRS/3G), and wireless local area networks[7].

Unit 2

Telecare practices, constraints

2.1 Telecare Practices in Greece.

Documentation of nursing care provided is vital important part of the nursing process. 38% of the daily nursing time is devoted to the recording of completed nursing care project. Nursing documentation is done in order to fulfill them administrative and clinical purposes. 7 are mentioned in the nursing literature ways of nursing documentation: 1) Narrative type notes, 2) The files that are problem oriented, 3) Files that are oriented to the source, 4) The exceptionally recording, 5) The vs case record, 6) The electronic records, 7) The kardex (nursing accountability in dossiers)

Studies concerning nursing documentation highlight the problem of incomplete and incorrect nursing records care. With the aim of patient safety, improving its quality of provided health care, the reduction of the cost of health services, the increasing patient and nurse satisfaction and securing it nursing work, an attempt was made to improve nursing documentation using sophisticated paper forms, but the problem remains.

In Greece, a mainly insular country which is divided in seven health regions, there has been materialized a National Network of Telemedicine since 2016, headquartered in the country's 2nd Regional Health Authority to which the large port of Piraeus and the Aegean islands belong. The same year, NNTM won the award of Business I.T. Excellence Gold (BITE) for its output, which is awarded in cases where technological innovation coincides with business excellence. The Network

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[5] Gonen, A., Sharon, D. & Lev-Ari, L., 2016, 'Integrating information technology's competencies into academic nursing education – An action study', Cogent Education 3(1), article no 1193109, 1–10. 10.1080/2331186X.2016.1193109

[6] Golinelli, D., Boetto, E., Carullo, G., Landini, M.P. & Fantini, M.P., 2020, 'How the COVID-19 pandemic is favoring the adoption of digital technologies in healthcare: A rapid literature review', Journal of Medical Internet Research 22(11), article no e22280, 1–20. 10.2196/22280

[7] Mougiakakou SG, Kyriacou E, Perakis K, Papadopoulos H, Androulidakis A, Konnis G, Tranfaglia R, Pecchia L, Bracale U, Pattichis C, Koutsouris D. A feasibility study for the provision of electronic healthcare tools and services in areas of Greece, Cyprus and Italy. Biomed Eng Online. 2011 Jun 7;10:49. doi: 10.1186/1475-925X-10-49. PMID: 21649924; PMCID: PMC3127994.

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of Telemedicine is based on the Public Data Network of OTE "INTERCONNECTION" and it includes 43 telemedicine units. Those are based on 12 regional and central hospitals, as well as 30 centers of the Aegean islands, including the border islands of Astypalaia, Icaria, Kalymnos, Ios, Kasos, Kastellorizo[8].

Specifically, regarding telemedicine, the National Telemedicine Network (EDiT), established by the second YPE of Piraeus and the Aegean, has installed telemedicine systems in 43 healthcare units. The EDiT provides the following services:

- teleconsulting;
- tele-education;
- tele-psychiatry; and
- the establishment of special healthcare units.
-

Telehealth in Greece was mainly promoted to address the issues of lack of healthcare professionals and infrastructure in remote areas, the remote islands of the Aegean Sea.

2.2. Existing Constraints

Although it is widely acknowledged, how useful a tool is for the exercise of the medical duty, there is still no specific legislation in Greece regarding the conditions for its legal operation, with the result that the responsibility for the provision of its medical services falls exclusively on the doctor.
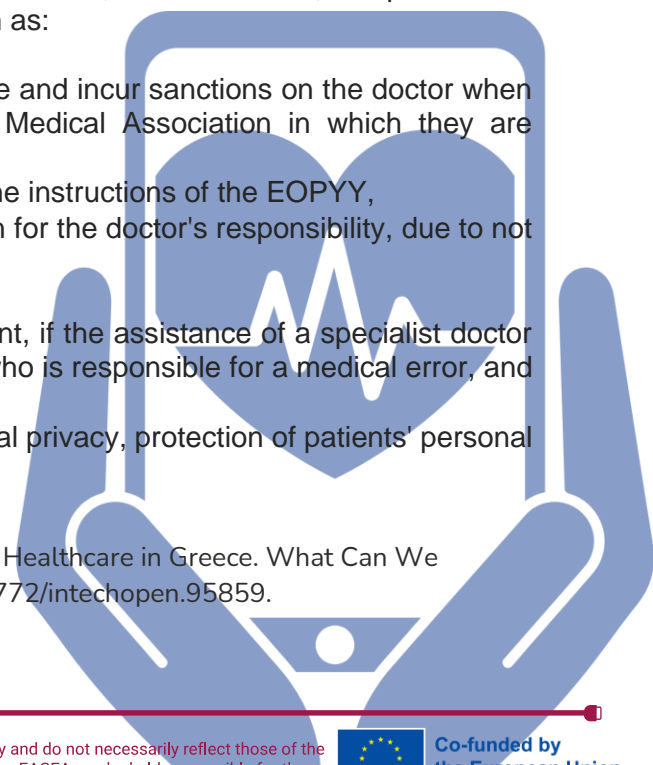
This follows from Law 3984/2011, which is the basic legal framework for the operation of telemedicine in Greece and which, among other things, states: "...The attending physician... is responsible for asking the patient or ... from a first-degree relative, the signed authorization to use telemedicine services. ...the attending physician uses telemedicine services at his discretion...".

The reason why telemedicine in Greece is not yet governed by special legislation is that the initial consideration of things had formed the opinion that the existing legislation adequately covers its services. In contrast, 16 EU countries have a special institutional framework and countries such as the USA, Canada, Australia, as well as other developing countries in Asia and America, have formulated special regulations and laws to govern telemedicine services.

Finally, according to relevant jurisprudence, if there has been no personal clinical examination, there is medical negligence in case of wrong diagnosis or treatment. So, in telemedicine, complex issues emerge from the lack of specific legislative provision, such as:

- it can be considered "itinerant" practice of medicine and incur sanctions on the doctor when the patients live outside the boundaries of the Medical Association in which they are registered,
- the prescription of preparations may conflict with the instructions of the EOPYY,
- the incorrect diagnosis or treatment being a reason for the doctor's responsibility, due to not performing a personal clinical examination,
- the necessity of the patient's written consent,
- which doctor has the obligation to inform the patient, if the assistance of a specialist doctor is required via teleconference and, by extension, who is responsible for a medical error, and finally,
- security issues in telemedicine applications, medical privacy, protection of patients' personal data.

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[8] S. Voutsidou, "E-Health Applications for Smart and Pervasive Healthcare in Greece. What Can We Expect?," Smart and Pervasive Healthcare, Jan. 2022, doi: 10.5772/intechopen.95859.

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The main challenges of the new national and international legislative framework are:

- promoting digital health;
- regulating technologies in order to ensure that patients receive treatment that is safe and up to specific standards; and
- responding to ethical issues.

In the case of Greece there are still no reliable financial data on the cost of implementing e-Health programmes and the benefits of their implementation. This is a significant lag in relation to the European reality, which is undoubtedly an obstacle on the further promotion of e-Health in Greece[9].

On top of all legislations gaps and constraints that remain to be the major inhibitor variable in the effective implementation of Telecare / Telemedicine practises in Nursing practise,

Unit 3

Medical systems in Greece

In Greece the inequality in health care enjoyed by the residents of the 17 urban centers in relation to the province is constantly increasing. Residents of remote areas have access to some agricultural doctor or health center but they have to spend considerable time and money to receive specialized medical care, the lack of which is critical incidents can be fatal. Telemedicine using electronic messages to transfer data opens new horizons in science of medicine[10].

the integration of digital healthcare in the Greek NHS recently drew specific regulatory attention with the adoption of EDiT for telemedicine systems (see 2.1 Healthcare Regulatory Agencies).

Greece has also demonstrated significant progress in the sector of patient tele-monitoring in the last few years. More specifically, the following programmes are being carried out:

- Telecare programme renewing health. The programme was applied for the first time at 2014 in the area of Thessaly, in Central Greece, granting monitoring remote services to patients with chronic conditions, in particular to patients with type 2 diabetes, cardiovascular disease and obstructive pulmonary disease.

- SmartCare programme. It's a European programme in which the Greek Municipalities of Palaio Faliro, Alimos and Agios Dimitrios participated. The project was related with the development and incorporation of technologies in the existing care structures for the independent living of patients and the elderly at home (home platforms)[11].

- United4Health programme. In the programme United for Health, there were overall 33 participants from all Europe as well as international organizations from the sector of electronic health. Greece took part through the 5th Regional Health Authority of Thessaly and Continental Greece, as well as via the "Cities NET S.A." In the context of the programme, there were selected patients suffering from chronic diseases (such as diabetes mellitus for the case of the pilot in Greece) by the treating doctors with the criteria of the need for intensive home monitoring and adjustment of medication[12].
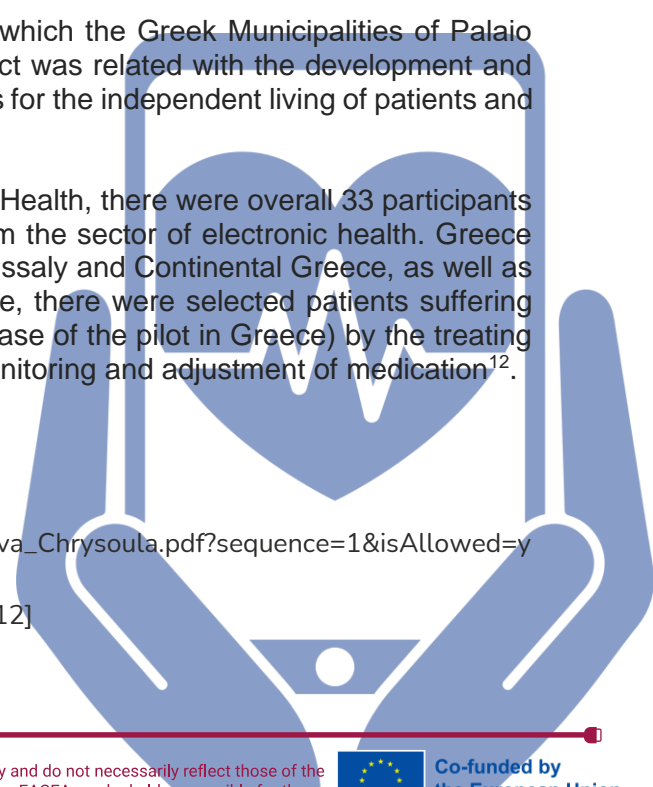
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[9]

[10]

https://dione.lib.unipi.gr/xmlui/bitstream/handle/unipi/9398/Giava_Chrysoula.pdf?sequence=1&isAllowed=y

[11] https://www.intechopen.com/chapters/74980

[12] https://dccg.gr/activites/united4health/ [Accessed: 2020-11-12]

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Unit 4

Opportunities

Existing solutions and practices described in previous paragraphs have proven some level of efficacy, although counting for <0.5% of traditional care settings. There is admittedly plenty of space ahead for additional and more efficient solutions. Studying existing cases experts highlight some key features that are anticipated to promote the use of Telecare solutions, such as:

1)cost-benefit solutions are proposed to improve care delivery health,
2) these new health care processes can be supervised continuously, and
3) the administrative issues regarding the use of these new one's technologies can be considered appropriately.

Telehealth nursing can be practiced almost anywhere, and it enables nurses to connect with patients without lost time spent traveling, registering, and waiting like there would be with traditional appointments and visits.

- Nurses can support and educate parents in a specific approach with very clear outcomes with the use of telehealth platforms.
- Telehealth nurses can learn about state-of-the-art therapies in medicine without being pigeon-holed into one small area of traditional nursing; they aren't bound to one department day after day.
- Telehealth nursing allows providers to build relationships with patients over the course of the entire disease process.
- Nurses in telehealth have meaningful contact with patients due to the lack of intrusions, interruptions, and distractions that plague traditional office visits.
- Telehealth nurses are able to spend more time with patients that would otherwise be spent traveling, charting, or running from one patient to another on-site.
- Nurses are more accessible to patients with telehealth, creating the opportunity for an adequate amount of care performed with fewer nurses.
- Nurses are able to experience the business side of their profession, enhancing their acumen in other areas[13].

The obvious solution is the use of technology and its establishment electronic documentation. Computers reduce errors that related to health care, mainly support in receiving decision, the easy reading of the registered data and the remove the copy. They also limit the time required by documentation process and provide authorized users with immediate access to patient data. The participation of nurses in analysis of the requirements, in the design and installation of its applications IT in their workplace is imperative, so that ensuring the responsiveness of these applications to the needs of users and therefore their success[14].

In Greece, e-Health has experienced a rapid development in the last two decades. As contradictory as it may sound, the economic crisis following 2019 became an opportunity for the country to proceed to extensive changes in the National Health System. That was necessary since health expenditure

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[13] https://intouchhealth.com/nationwide-nursing-shortage-eased-with-telehealth-services/
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had to be significantly reduced. In this context, e-Health applications were deemed very effective so that the country could secure resources for the repayment of foreign loans.

An additional pressure to the National Health System was given by the thousands of refugees who arrived in the country in the last few years. According to the data, only in the year of 2015, Greece in collaboration with NPO, provided medical care to approximately 870,000 refugees.

The new technologies provide various possibilities, readjusting the provided healthcare forms, depending on the individualized needs and expectations of every patient. Geographical distances are nullified and the provision range of health services is expanded, granting equal access even to residents of removed from the urban centers areas. This way, the citizens' feeling of their equal participation to the public commodities is consolidated, particularly to those who live in remote and isolated areas[15].

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S. Voutsidou, "E-Health Applications for Smart and Pervasive Healthcare in Greece. What Can We Expect?," Smart and Pervasive Healthcare, Jan. 2022, doi: 10.5772/intechopen.95859.

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[15] https://www.intechopen.com/chapters/74980

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Adult Education Institution Studium – Croatia

Unit 1

Missing skills and digital gaps, health support needs and required and existing ICT competences

In the preparation of medical personnel for the application of information technology, it is necessary to take into account the number of personnel and different levels of information technology knowledge and skills. The introduction of information systems undoubtedly requires a positive attitude from the staff who will use the system. Based on the research on the attitudes of health personnel towards the informatization of healthcare, it can be said that Croatian healthcare is ready for informatization, provided that current and future healthcare personnel are provided with adequate medical-informatics education, workplace equipment, and the opportunity to participate in the development and improvement of the health information system. The need for the specialization of medical personnel in informatics based on world trends is recognized with the aim of improving health care because medicine and health care as a science are continuously progressing. Patients should be given easy access to the necessary information, while special attention should be paid to the updating and credibility of the information itself.

The situation is aggravated by the fact that healthcare workers are overburdened due to the high demand, but also their shortage on the labor market in Croatia, and the emotional intensity of their work environment. The shortage of healthcare workers can partially be replaced by using the Internet of Health Things (IoHT) automatic monitoring of parameters in chronic patients using smart devices/sensors, but also in the automation of logistic activities. Achieving harmonization of the entire system will be one of the biggest challenges in the future steps of improving e-Health services.

The unification of all systems in the future, as well as users of health system services, is of great importance.

Unit 2

Telecare practices, constraints

ICT systems e-Health, e-Ordering, e-Carton, IT system for telemedicine as well as various ICT systems developed by individual hospital centers and private medical institutions are used in the Republic of Croatia. As an example of telecare practice, we can take the telemedicine IT system, that provides remote health services and ensures the availability of quality health care in all parts of the Republic of Croatia, including islands and rural areas. The telemedicine department of the Croatian Institute for Emergency Medicine (HZHM) maintains the computer and communication infrastructure and regulates the introduction of telemedicine services into the health system within the Network of Telemedicine Centers, which today covers 73 health institutions and has 154 active centers.

Telemedicine services are provided at the primary, secondary, and tertiary levels of health care, and recipients and providers include a variety of healthcare facilities, from big clinical hospital centers in major cities to small health centers in rural areas. The mentioned institutions make up the basic Network of telemedicine centers, while the extended Network includes trading companies that perform healthcare activities and private healthcare professionals. The telemedicine service of HZHM provides the information and communication infrastructure for each telemedicine center in the basic network, and at the same time educates health workers about its use.

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This system allows a digital exchange of medical records, medical test results, and x-rays; making diagnoses; getting a second medical opinion; or remote treatment. It is active in the field of radiology, cardiology, neurology, hemodialysis, psychiatry, and transfusion medicine. It also provides e-Training services. Thanks to technological innovations, telemedicine services are often redefined and perfected, that is, continuously improved and adapted to health requirements. It is possible to receive them in the telemedicine access center, while the telemedicine specialist center is the place for receiving and providing telemedicine services according to specialties.

In the Republic of Croatia, the Croatian Institute of Emergency Medicine uses two telemedicine technologies: real-time and store-and-forward. In some cases, both technologies are used, for example, when a specialist in gastroenterology uses a video conference because it is a complex health problem and they need a consultation with a colleague from the telemedicine specialist center from another hospital. Therefore, both doctors examine the endoscopic material in parallel and communicate via video link, but they provide one telemedicine service. Store-and-forward technology is much easier to implement, and it is more accepted by healthcare professionals. Namely, the low level of acceptance of telemedicine among healthcare workers is the biggest challenge that the telemedicine service of HZHM faces when introducing telemedicine.

The use of digital technologies in medicine in Croatia is mostly represented in private healthcare institutions, and one example would be the Magdalena polyclinic, which has been practicing the use of digital technology in communication with its patients since 2000. Through telephone, e-mail, and webcam, doctors connect with patients and their colleagues every day, making decisions about treatment, and in addition, excellent examples of the use of digital technologies in the Republic of Croatia would certainly be the portals Dr.hr, Little Dot and TeleDoc.

Dr.hr is a portal that brings together doctors, retired doctors, interns, contracted private practice doctors, scientists and professors who deal with a specific field, as well as polyclinics, private practice clinics and other institutions and companies that provide healthcare services. The system works so that doctors determine available appointments for online consultation, and users choose the doctor they want to speak to and contract the online consultation service. To make an appointment with a specialist/doctor, you need to register beforehand. The doctor, the specialist and the health field are chosen by the users. Once the service is paid for, the appointment is considered contracted. It is only up to users to connect via video link with the chosen doctor at the agreed time.

LittleDot is an application that also brings together a large number of doctors, but offers a wider range of services than the Dr.hr portal and is designed as an application that will be aimed at parents and their children. The goal of this application is for parents to research diseases and symptoms less on Google and to get the necessary information from health professionals in any field of health in just a few clicks. Of course, apart from parents, the application can be used by anyone, because in addition to paediatrics, experts from the fields of psychiatry, radiology, infectology, gynaecology and many others are at your service.

It is possible to request a consultation in three ways. After selecting the desired expert from a specific field, which can be filtered, you can read his short biography and contact him by phone, in writing, with a short consultation and, most importantly, through a video call. Another valuable thing that the LittleDot application offers is the "diary" of the child, i.e. monitoring its progress and health status, which was actually the first idea of this project, and this is what parents need, especially new ones - to record symptoms, weight, length , first teeth and everything else.

TeleDoc is an additional service for users of Wiener Insurance that can be arranged at a special price with a supplementary, additional or car insurance policy. In this case, TeleDoc works through an application for mobile devices, which provides an unlimited number of video consultations with a doctor 24 hours a day. TeleDoc allows the client to establish a video call and talk to a licensed doctor

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without long waiting or making appointments at any time of the day and from any place in Croatia or abroad, by selecting the Call a doctor option. The number and duration of calls are not limited and the doctors are available 24/7. In order to facilitate the conversation with the doctor, there is also an option to save the medical documentation and the possibility for the doctor to inspect the medical documentation. Medical documentation is not shared with the doctor, and the doctor has access to the documentation only during the call. Each call ends with a written observation by the doctor, so that the user can track all his calls in the call archive via the application.

Another example of the use of digital technology in medicine, but with the influence of artificial intelligence, is certainly Andrija - a digital personal assistant designed to share advice at the beginning of the coronavirus pandemic in the Republic of Croatia. Andrija performed tasks which included:

• Educates people on how to recognize the symptoms of coronavirus infection in themselves and others. Through assisted self-assessment, citizens get a better understanding of the risk of potential infection, when they can be calm, and when they should take action for the benefit of themselves and others

• Assists people in contacting the relevant institutions, directing everyone to the right address, thus saving time and energy for citizens and doctors in these moments of burden on the health care system

• Enables people to report relevant information from their own household and thereby fulfil their civic duty to assist epidemiologists dependent on real-time data to establish or withdraw protective measures.

Unfortunately, Andrija is no longer in use, but it is good to know that when emergencies arise, digital solutions are sought that can help the wider population and give them useful advice.

Unit 3

Medical systems in the partner countries

Croatia is one of the EU countries that could boast of an enviable level of digitization of healthcare and the healthcare system, although the level of digitization of healthcare and the healthcare system has begun to stagnate. The service of the Croatian system "e-Health" was designed to simplify the use of health services for citizens, but also to improve the user experience in searching for and meking appointments for the desired services. Simplicity and accessibility of health services are of great importance due to a large number of users of the system, and digitization proved to be a necessary step forward in raising the quality of the service to a higher level. In the period between 2016 and 2020, one of the most important steps forward in the functioning of the e-health system was the implementation of the CEZIH project. The result of that project is the establishment of the electronic health records, and allowing communication through a patient portal called the Health Portal. The purpose and goals of this project are to strengthen the role of the patient in the system, but also to make his medical record available to specialist doctors who are not part of primary healthcare. What is also important to emphasize with Health Portal is the independent management of personal data by the user of the service, as well as the fact that users can authorize other participants in the health system (family doctors, pharmacists, dentists, emergency services, specialists, etc.) for the same access. The system also foresees the authorization of cross-border exchange of information with other member countries of the European Union. It is also important to emphasize the role of the Croatian Institute for Emergency Medicine, which is in charge of developing the central IT system for 21 county Emergency Medicine Centers with a central call center and an advanced system for exchanging information with ambulances. The same Institute is

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responsible for the development and construction of telemedicine centers with a highly available information network for communication between all centers. All previous integrated communication systems proved to be extremely successful at a very high level during the global coronavirus pandemic, but they also pointed to the need to unify all existing registers into one network that would be integrated with the hospital information systems. Currently, a large number of hospitals are developing or have already developed their own information systems that cover business processes but are not integrated with other stakeholders in the system. On the other hand, the Croatian Institute of Public Health manages more than 20 integrated registers, such as the Register of Health Workers, the Cancer Register, the Diabetes Register, and others.From all of the above examples, we can conclude that the IT system is very functional and at a satisfactory level of development, but when it comes to interoperability among individual system stakeholders, it is important to emphasize that it is a rather complex process and there is significant room for improvement.
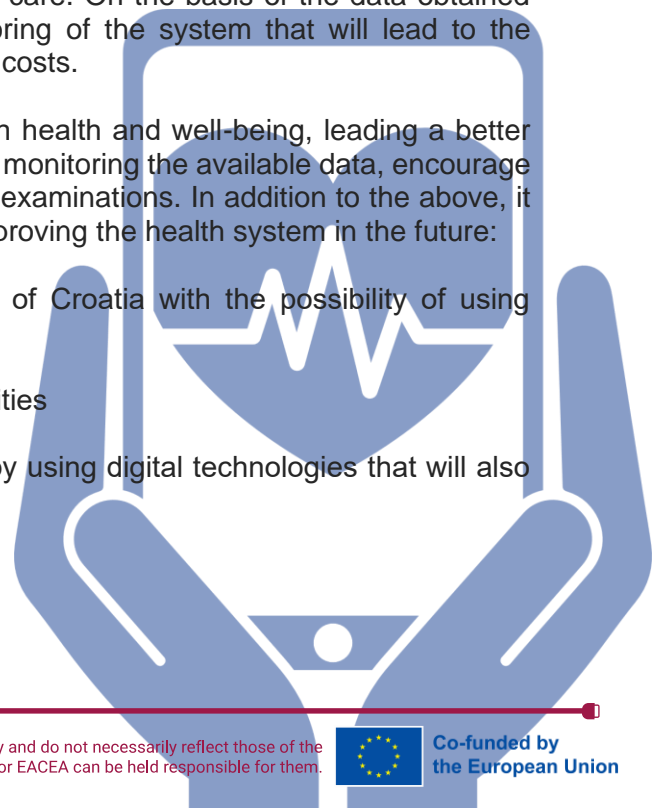
Unit 4

Opportunities

Technological solutions for e-Ordering and e-Medical records have already been installed and successfully implemented in the Croatian healthcare system. It is necessary to continue implementing these two solutions and remove the remaining obstacles for their 100% application. In this way, both systems could come to life very quickly, which would provide the "quick win" needed for a public campaign for the use of these solutions by both health professionals and patients. In parallel with the establishment and popularization of these two projects, it would be necessary to define the next phases of digitalization of medicine.

By 2027, e-Health in Croatia should:

• Provide integrated and multidisciplinary patient care, i.e. their monitoring throughout the entire treatment process, from outpatients, hospital to rehabilitation. Given that the existing IT systems are currently not connected, for the sake of a better treatment outcome, it is necessary to digitally connect the hospital system, the IT system of primary health care and the information system of care and rehabilitation.

• Ensure data processing, their analysis and information that support and supplement the work of healthcare workers and improve the safety and quality of care. On the basis of the data obtained from e-Health records, develop the analysis and monitoring of the system that will lead to the improvement of treatment outcomes and rationalization of costs.

• Provide support to the population in managing their own health and well-being, leading a better quality and healthier life at home or in the environment. By monitoring the available data, encourage the population to adopt healthier lifestyles and preventive examinations. In addition to the above, it would be useful to improve other services and work on improving the health system in the future:

• Provide all users of public healthcare in the Republic of Croatia with the possibility of using telemedicine without additional charges

• Digitally train healthcare personnel in all healthcare activities

• Unburden the hospital system with medical paperwork by using digital technologies that will also contribute to the preservation of the environment

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University of Thessaly – Greece

Unit 1

Missing skills and digital gaps, health support needs and required and existing ICT competences

1.1 Telenursing in Greece. History up to now.

The digital health sector, Greece continues to lag behind other European Union countries in digital transformation infrastructure. According to a study by the Foundation for Economic and Industrial Research (IOBE) on digital health and real-world data, Greece is ranked 26th among the countries of the EU in terms of the use of electronic health records and is 25th in the exchange of clinical data electronically [1]. However, its performance in telemedicine is better, where it ranks eighth.

On the issue of "e-Health", the Greek Ministry of Health (MoH) website refers to the definitions used by the World Health Organization (WHO): "[...] the efficient and safe use of [ICTs] in support of health and health-related fields, including healthcare, monitoring and treatment, research and knowledge" [2].

In Greece, the adoption of digital healthcare infrastructure will be a key component in ensuring access to health care services in isolated geographical areas. An effective deployment of telehealth technologies will enhance the ability to better meet the healthcare needs of those in rural and frontier parts of the country.

However, there is currently no regulatory framework on telehealth and, as a result, issues such as data privacy, security or medical liability remain to be addressed and the ways to address them are still unclear.

Telehealth and Virtual Hospitals/Virtual Visits. In virtual hospitals, patients are connected with healthcare professionals remotely (via video or other technologies) in real-time for consultation on medical issues. Similarly, a virtual visit is the capability to consult with a doctor through a smartphone, tablet or computer, whether from home or work, without the need for an in-person appointment, regardless of the time of day.

Telehealth and Remote Healthcare. Constant monitoring of the patient's condition and performance of medical examinations away from medical facilities is described as remote medical care. This form of healthcare is performed with the use of specific technologies (such as mobile devices, wearables, sensors) to facilitate interaction between clinicians and patients at home [3].

1.2 Identified missing skills

Evidence from the literature suggests that undergraduate nursing programmes do not adequately prepare nursing students to be practice-ready on completion of their nursing courses [4].

1.3 Identified missing gaps

Notwithstanding, the use of telehealth raises issues of cross-border provision of services, especially regarding licensing and authorisation. Doctors generally obtain a licence to practice in a certain area and are subject to the legislation and rules of conduct (including, most notably, medical ethics rules) of that area. The main liability considerations regarding cross-border provision of medical services include:

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- patient rights;
- product liability;
- jurisdictional issues; and
- personal data.

1.4 What are the real needs

Nursing in a digital age requires integration of information technology (IT) into the larger body of knowledge in nursing and in addition training the student nurses to adapt to an IT-rich work environment [5]. In fact, the adoption of digital solutions is necessary to contribute to the new digital-based models of care [6] entering the healthcare sector globally.

1.5 Existing ICT competences

These systems support data transmission over simple phone lines, internet connections, integrated services digital network/digital subscriber lines, satellite links, mobile networks (GPRS/3G), and wireless local area networkΣ [7].
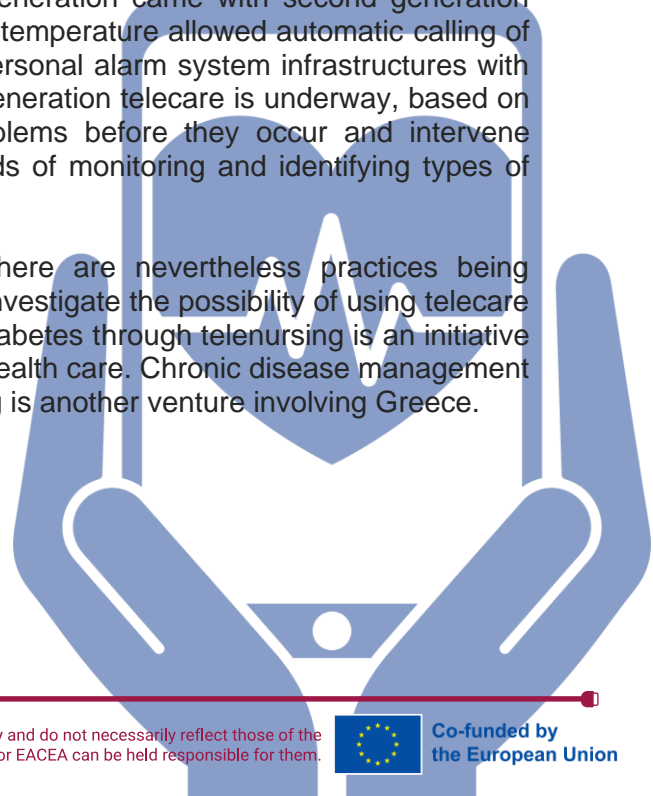
Unit 2

Telecare practices, constraints

Nursing care is a dynamically evolving concept that adapts to health system changes, global developments, new technologies and infrastructures, demographic changes and different diseases. Given the current situation and the recent COVID-19 pandemic, it is now more than ever necessary to use technology to seek and receive reliable clinical guidance and care through a telecare system. The challenges in telecare for its widespread application in the health field, lies in the education and training of future health professionals.

Telenursing emerged to describe the nursing care of patients at a distance, using new technological applications. Nursing telecare in Greece, a more specialized term for providing remote care, is divided into three generations. The first generation of telecare, which began to be implemented as early as 1980, allowed the elderly, the disabled and the chronically ill to send calls for help via a mobile device with personal alarm systems. Calls were directed to a center, which then contacted family members and calls for immediate help. Personal alarm systems are provided as public or private services. A number of upgrades over the first generation came with second generation telecare. The use of sensors such as fall, motion, smoke, temperature allowed automatic calling of health services in case of emergency and is based on personal alarm system infrastructures with additional video conferencing applications. Today, third-generation telecare is underway, based on new ICTs with the ability to detect potential user problems before they occur and intervene proactively. These applications use sophisticated methods of monitoring and identifying types of behavior developing personalized preventive care [8].

Although telecare is in its early stages in Greece, there are nevertheless practices being implemented. Projects (table 1) have been developed to investigate the possibility of using telecare in Greece such as: management of patients with type 1 diabetes through telenursing is an initiative to utilize information and communication technologies in health care. Chronic disease management in heart failure focusing on telecare and remote monitoring is another venture involving Greece.

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Medical systems in Greece

The FEELL bracelet combined the Feel Emotion Sensor and Cognitive Behavioral Therapy (CBT) to quantify a person's emotional state for the first time and provide emotional health support 24/7/365 time, to those who need it. Thus, it is able to support, through the use of technology, people who do not have access to traditional mental health services, for example those who live in remote or rural areas, or those who cannot afford appropriate treatment, or those whose issues mental health problems prevent them from seeking appropriate treatment [9].

Another project concerned the determination of the risk of early abdominal obesity in adolescents using bioelectrical impedance analysis (BIA) in schools evaluated the levels of adiposity and other body composition parameters of Greek adolescents in relation with their metabolic syndrome (MetS) characteristics 10].

In the 3rd generation of telenursing, the following programs have been developed which aim at disease prognosis using artificial nursing and machine learning. The Vodafone Foundation utilizes the company's technological capabilities by providing, in collaboration with the Athens Medical Center, free preventive health services to patients living in remote areas of Greece. Furthermore, the Program includes tests such as oximetry, measurement of blood pressure and sugar, total cholesterol and triglycerides, the results of which, combined with the results of the clinical tests already included in the Program, make it possible to estimate cardiovascular risk for the next decade.

The WATSON for Oncology platform is an artificial intelligence (AI) system created by IBM as a tool to guide oncologists towards better treatment. In this system, all documented knowledge related to oncology and related specialties have been introduced. On this basis, all new knowledge is entered daily by IBM experts working with distinguished oncologists of the US Memorial Sloan Kettering Cancer Hospital (MSKCC) so that the system is completely up-to-date. This system was adopted by the HYGEIA group [11].

A study in schools in Attica evaluated through telemedicine the levels of obesity and other body composition parameters of Greek teenagers in relation to the characteristics of the metabolic syndrome. The vidahealth® app for transferring data from smart telemedicine equipment, via a Bluetooth sensor, was installed on each study laptop. Data (weight, body mass, blood pressure, blood glucose and triglycerides) were automatically recorded via telemonitoring devices (weight scale, blood pressure device, blood glucose and triglyceride device) and stored in the Vida24® data server (vida24; Vidavo Health Telematics, Thessaloniki, Greece) in each adolescent's personal electronic health file (e-health) [10].

Table 1: Projects involving telecare and telehealth in Greece			
Project	**Year**	**Place of development**	**Keypoints**
Renewing Health (12), (13)	2010	Thessaly & Central Greece	•wearable/portable devices used to monitor some clinical parameters. •remote data control •patients with cardiovascular disease, chronic obstructive

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			pulmonary disease and diabetes participated in this project
eTrikala (14)	2014	Trikala city	•a center providing telemonitoring services to chronic patients suffering from the following chronic diseases: diabetes type II, chronic heart failure, and COPD (later extended to older population suffering from mild cognitive impairment) •Patients were equipped with light-weight handheld devices and could record their vital signs at home. •The data recorded was periodically transferred to the municipality hospital and private physicians over the internet or GPRS for review and feedback by doctors via the telehealth center
The PERKA service (15)	2006	Democritus University of Thrace	•Home Telehealth for Patients in Peritoneal Dialysis proposed framework
SmartCare (16)	2013	Central Greece	•Development of integrated health and social care services which facilitate independent living for older people
vhMentor (17),(18)	2012	Technological Educational Institute of Kalamata	•sensor technologies and knowledge management •healthcare providers will be able to actively monitor prehospital,

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			hospitalized and ambulatory patients •automatic correlation of healthcare and environmental measurements with care plans through a reasoning engine
Metabolic Control in Patients with Type 1 Diabetes Mellitus(19)	2015	Thessaloniki city	•telenursing services
Tile-Ippokratis (20)	2009	Chios island and Cyprus	•telecollaboration and teleconsultation services between health care personnel and between health care personnel and patients •ehealth services for elderly and patients with chronic diseases (Island of Chios) and postsurgery patients (Cyprus)
National e-Health Program for the Prevention and Management of Overweight and Obesity in Childhood and Adolescence(21)	2020	Greece	•e-Health application •program for preventing overweight and obesity in children and adolescents
e-NeΦros(22)	2020	Department of Nephrology, "G. Papanikolaou" University General Hospital, Thessaloniki	•electronic care system to improve chronic kidney disease patients' healthcare management both at inpatient and outpatient level
myAlgos (23)	2022	Third Cardiology Department, Hippokration Hospital, Aristotle University	•combines patient care with an mHealth component. •cooperative chronic disease management system for patients with atrial fibrillation
WELCOME project (24)	2014	United Kingdom (UK), Ireland, Greece and Netherlands	•a telehealth-based system called Wearable Sensing

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			and Smart Cloud Computing for Integrated Care to COPD Patients with Co-morbidities (WELCOME)
Intermed (25)	2011	Greece, Cyprus and Italy	•Telecollaboration and teleconsultation services between remotely located healthcare providers, •telemedicine services in emergencies, •home telecare services for "at risk" citizens •eLearning services for the continuous training healthcare personnel (physicians, nurses etc) and persons supporting "at risk" citizens.

New technologies have the potential to radically transform the industry, however the challenges they involve are significant: regulatory barriers, financial constraints, but also difficulties in effectively digitizing patient data. Despite the steps it has taken on the road to further strengthening the digital health sector, Greece continues to lag behind in digital transformation infrastructure. The main obstacle for the limited implementation of telecare practices in our country is the absence of mechanisms for their financing and compensation at the expense of patients, health professionals and the health system. Also, the attitude of the existing healthcare staff towards the new information and communication technologies contribute to preventing the faster integration of digital technologies in telecare.

Due to the limited training of nurses in information and communication technologies, there is a great difficulty in the implementation of telecare activities to the extent of unsuccessful outcomes and the few limited efforts that are attempted in Greece.

All the eight University Nursing departments in Greece have a mandatory Health Informatics course in their curriculum, only 3 departments have additional courses of information and communication technology and only in the University of Thessaly, there is a course on Telematics Services in Health. Telecare Nursing creates the necessary conditions, but also the need for the development of distance education in Nursing, the use of simulation in laboratory education, documented nursing practice and nursing research, based on electronic protocols and algorithms. The application of telelearning in the field of higher education paved the way for the integration of Telenursing in academic curricula. Although telehealth falls within the scope of nursing practice and professional nurses possess the necessary knowledge and skills to provide safe, effective, and personalized care, additional specialized training is nevertheless required to provide telenursing care. Therefore,

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the integration of telehealth into Nursing curricula is required for the development of education and the dynamic development of Nursing.

The most comprehensive effort that has been made in Greece to date in terms of the use of telemedicine and its penetration both in the community of health professionals and in the benefiting population, is the National Telemedicine Network, Department of the 2nd Ministry of Health of Piraeus and the Aegean (National Telemedicine Network, 2023). It is a network of telemedicine stations implemented by the 2nd Ministry of Health which started its operation at the beginning of 2016 and telemedicine stations were installed: in Attica in hospitals Stations in Hospitals and Health Centers of the Aegean at the Papageorgiou hospital in Thessaloniki and in Home Care Stations placed in hospitalized patients at home or in social care structures The services provided by the above stations include: Ø Teleconsultation Ø Telepsychiatry. Ø Regular Telemedicine Clinics Ø Telemedicine for emergencies Ø Prevention and information actions.
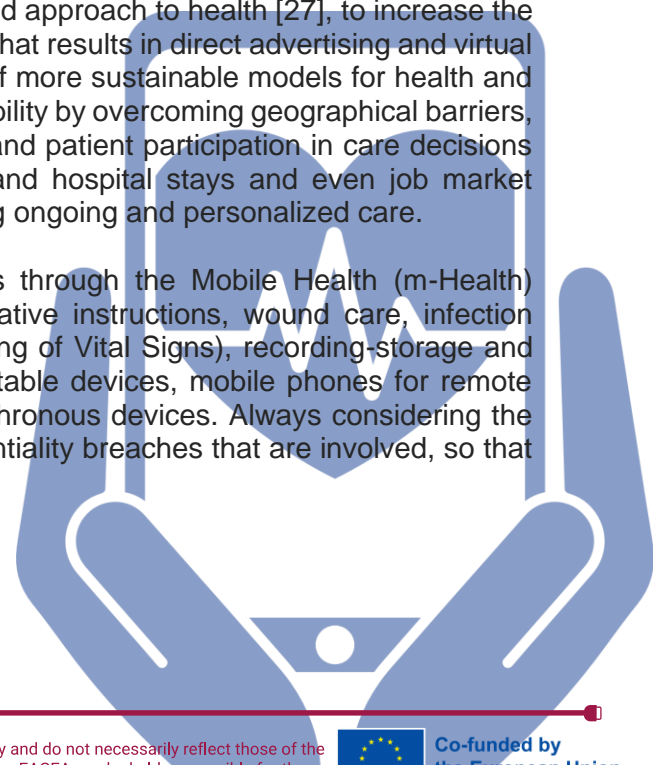
Now the existing infrastructure of the National Telemedicine Network is enriched and its scope of action is extended in order to cover the Health Regions. In detail, they will be installed: Ø 305 new Patient Doctor Telemedicine Stations and 35 new Doctor Consultant Telemedicine Stations that will be installed in specific Healthcare Facilities. Ø 500 tablets Ø Home Monitoring Systems Ø 5 Telemedicine Training Stations Ø 3 new Regional Support Centers Ø 1 Monitoring & Control Center Also included are diagnostic medical equipment and telemedicine software, as well as configuration services.

Telenursing appears to be a valuable tool for governments and stakeholders in the macro environment of health services to meet increasing health care needs and their rising costs. Despite the development and the great efforts of the scientific community, the practice currently in Greece has not shown results. However, the unprecedented phenomenon of the Covid-19 pandemic, which has spread rapidly around the world, has drastically affected the lives and daily lives of workers, families and businesses worldwide. A special group of people are the patients and chronically patients. The different segments belonging to digital health, such as telemedicine, telehealth, telenursing, telecare, were imposed in a short time and forced everyone, especially the workers who had to provide services from home due to the confinement and isolation measures imposed by the government to avoid the spread of the virus, making it a top priority to ensure the health of citizens to be informed, acquire knowledge and skills in order to recognize, treat and prevent the spread of the virus. The pandemic was therefore a driving force for the spread of telenursing [26].

Generally, the benefits of telenursing are to bring about a reduction in the cost of hospitalization of patients that burden health systems, to take a goal-oriented approach to health [27], to increase the efficiency of doctors [28], to be a beneficial feedback loop that results in direct advertising and virtual well-being for all stakeholders [29], to facilitate the entry of more sustainable models for health and social care, improve the quality of care, safety and accessibility by overcoming geographical barriers, making it possible for patient self-care education, family and patient participation in care decisions and even reducing emergency department (ED) visits and hospital stays and even job market flexibility. Its use is liberating rather than binding, providing ongoing and personalized care.

The opportunities created are therefore many, such as through the Mobile Health (m-Health) application (recording menstrual periods [30], post-operative instructions, wound care, infection treatment, use of interactive video, reception and recording of Vital Signs), recording-storage and the ability to send data. Furthermore, implantable or portable devices, mobile phones for remote monitoring, a combination of direct monitoring and asynchronous devices. Always considering the risks of ethical/privacy/personal data and medical confidentiality breaches that are involved, so that basic training and increased compliance are needed [31].

Unit 4

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Opportunities

In Greece from the above-mentioned _projects_ it can be concluded that telenursing and telecare provides opportunities such as: a) Extended access to nursing services b) Home telenursing c) Chronic conditions' management d) Large-scale prevention interventions e) A new job opportunity f) A promising field of research As a result of all the above, all these tools are becoming a research priority for many institutions in Greece and around the world. Digital applications seem likely to optimize patient flow, information availability, efficient management of complex support processes, patient safety and privacy. Pharmaceutical companies, healthcare service providers and direct stakeholders and interested parties are foreseen in the near future to use these practices as mainstream methods [32].
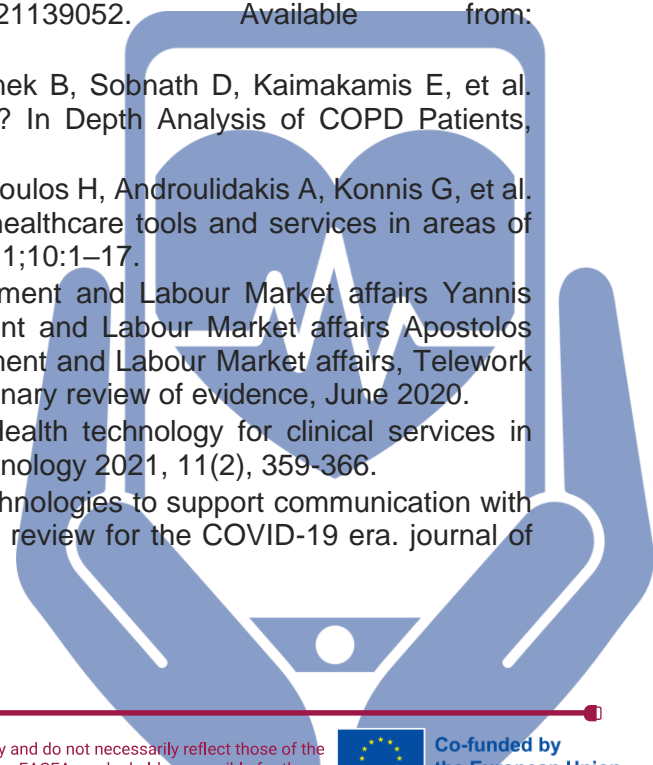
The cornerstone for reducing the difficulties in implementing telenursing in Greece is a new partnership between industry, government and health professionals in order to follow a common and accepted program of basic principles that can enhance innovation and investment in telenursing. There is a particular need to provide more precise specifications in health tenders and quality criteria per type of tender (e.g. infrastructure, electronic health record - EHR, e-prescribing). Projects should be responsive to patient needs, not vendor needs. Although telehealth falls within the scope of nursing practice and professional nurses possess the necessary knowledge and skills to provide safe, effective, and personalized care, additional specialized training is nevertheless required to provide telenursing care. Therefore, the integration of telehealth into Nursing curricula is required for the development of education and the dynamic development of Nursing.

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