DigiNurse Model

A New Approach to Digital Coaching for Nursing Students

Editors
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DIGINURSE
Learning ICT Supported Nursing for
Self-Management of Patients.

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Foreword

Kristiina Hyrkäs

Today, many of us are already using Fitbits to track our steps, Apple Watches to remind us when to stand up and go outside, and smartphone applications to track our health records at the mere touch of an icon. These are just some examples of new wearable devices and technology that are increasingly playing a role in our personal health.

In addition to the fast rise in available wearable devices, the development of electronic health (e-health), defined as the use of communication and information technology (ICT), has increased in healthcare. Examples of these include telehealth and telemedicine, Electronic Health Records (EHR), patient portals and other hardware and software services aimed at enhancing care delivery. Mobile communication devices (e.g. smartphones or tablets) can also be used to exchange information or data between providers and patients. These mobile health (m-health) applications, considered a subset of telehealth, are typically used to track and process a large volume of lifestyle and well-being information.

The technological development of recent decades has made it possible to provide healthcare services to patients through virtual clinics, which enable teleconsultation and videoconferencing and in some cases computer-assisted surgery. In addition to efficient methods of communication between health professionals and the exchange of diagnostic images, the EHRs allow storing and sharing of a patient's clinical history (e.g. test results, medication, and general clinical history) with other providers, supporting clinical actions.

The growth of the Internet has nurtured the diffusion of web-based e-health services such as interactive education, disease prevention programmes and online discussion groups for patients and consumers. The advantages of these services are supported by the fact that mobile communication devices (e.g. smartphones and tablets), in comparison to personal computers, are continuously on and connected, and that they are carried along by almost everyone as a part of modern lifestyle, making them an ideal means to deliver health-related information. It is also possible to assume that these devices empower patients and promote

self-management, enhance communication between patient and physician (or care team), increase the potential for the improvement of a patient's adherence to treatment and ultimately encourage greater participation in medical decision-making.

The development of the technologies has been fast, but most m-health applications are still considered to be "fitness" or "wellness" devices rather than medical devices in the healthcare field. Standardised methods are not yet available for quality evaluation of the accuracy of information provided by these applications and potential privacy and security issues related to the exchange of sensitive data. Understandably, these types of concerns may increase hesitation among healthcare professionals to use ICT. According to findings from one recent survey, only 25% of doctors recommend the use of m-health to monitor patients, and 42% were worried that m-health apps will make patients too independent. On the other hand, another study has projected that m-health applications have a significant potential to improve the control of risk factors and health status, particularly for patients with chronic conditions such as arterial hypertension, diabetes, and heart failure. Today there are already devices or wearable sensors available for the self-monitoring, tracking, and recording of vital signs, including blood pressure, body weight, lipid profile, blood glucose, physical activity, and drug intake.

The commissioning of the new technology today and in the future means an extensive reform in healthcare. Most importantly, it challenges nursing education regarding teaching, learning, patient education and counselling. Those nurses and educators who are currently working in the workforce, teaching and mentoring our students, need support and continuing

> The growth of the Internet has nurtured the diffusion of web-based e-health services such as interactive education, disease prevention programmes and online discussion groups for patients and consumers.

education. They are already integrating ICT skills in their daily work, but they also need to be able to position themselves and the next generation of nurses to practice in a new technology-rich environment. Growing evidence from recent studies reinforces the necessity of this standpoint by showing that nursing students consider their relationships and social interactions with nurses to be one of the most influential factors in the use of ICT. Furthermore, nurses' attitudes regarding the use of clinical ICT seems to have a significant effect on the student use of these technologies. Consequently, it is indeed essential that our future and current nurses are prepared and able to master the digital environment and its contemporary approach in nursing. Technology is here to stay and will gradually change various aspects in healthcare.

Today, technology infiltrates all healthcare disciplines with the ultimate goal of utilising the best, appropriate technologies while working across boundaries and borders to improve patient health outcomes. The importance and worthwhileness of ICT allowing access to high-quality, consistent health care is probably more obvious now than ever before. During the ongoing COVID-19 pandemic, the use of technology has proven to be critical in facilitating patient appointments in order to continue with healthcare provider visits, for example via video conferencing and minimising the need for in-person visits.

As digital technologies continue to emerge and develop, it is very positive that the European Union (EU) has established funding to support projects that incorporate technology into nursing, especially in the education of our next generation of nurses. This book and its authors' contributions are very timely and visionary. The chapters reinforce an emerging vision from our scholars' continuous work over the past few years to develop a common learning model in digital health for nursing education, to train our students and to leverage emerging technologies to provide patients with the best care possible. This vision encourages current and future clinicians to increasingly utilise digital health assets to improve outcomes for patients, especially those with chronic health conditions, while welcoming nurses and teams of healthcare professionals in the EU and collaborating countries to a new, e-Health era.

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Contents

1 Introduction

Raija Kokko, Nina Smolander and Annukka Isokoski

Some people call the current era revolutionary. The revolution we are witnessing is caused by digitalization and it penetrates and conquers all aspects of people's daily lives. People use the internet extensively, and they are also, searching for health information using various digital devices, apps and other solutions. They show an interest in taking control of their own health (NHS England, 2017).

This is one of the reasons why a growing demand for developing tailor-made and patient-centered care in the coming years has become crucial. In addition, an aging population with chronic illnesses as well an increasing number of life-style-related diseases generates problems which need to be solved to secure citizens' access to healthcare services (WHO, 2012). As healthcare costs have increased in many countries, it is vital to use every opportunity to curb the raise of costs in societies. A future challenge will involve providing more treatment and high-quality care with the same resources as previously (Kaplan & Porter, 2011; WHO, 2015). Therefore, there is a need for integrated, economically more efficient care. By providing smarter care, online or digitally, with more focus on prevention and early detection of diseases, European societies will be better equipped to respond to the availability of healthcare services than before. Furthermore, the World Health Organization has argued that the exploitation of e-health opportunities can increase equality among citizens of all societies (WHO, 2012).

Recent ICT progress and technological developments have also transformed the workflow in the field of healthcare. The sort of care that requires the physical presence of a healthcare provider, is now partly implemented through online services. Electronic transfer of data, telecare and tele-coaching can contribute to the development of a model that enables patients' active participation in their healthcare process (Elf, Ossiannilsson, Neljesjö, & Jansson, 2015; Sawesi, Rashrash, Phalakornkule, Carpenter, & Jones, 2016; Brady, Segar & Sanders, 2018). Through the active participation and support from a healthcare team, patients become more independent than before in managing their chronic illnesses.

The educational institutions training healthcare students need to integrate the use of new methods and smart technologies into their curricula to ensure that future nurses will be equipped with digital skills as part of their digital literacy (Stauffer, 2020). Eshet noted already in 2004 that digital literacy is among the survival skills of the digital era. According to him, digital literacy includes a large variety of complex cognitive, motor, sociological, and emotional skills, which users need in order to function effectively in digital environments (Eshet, 2004).

The Erasmus+ Strategic Partnerships for Higher Education project, DigiNurse: ICT supported Self-Management of Patients responds to the future challenges related to the digitalization of future healthcare by developing a model to strengthen nursing students' digital competence. The project was funded by the European Union and was launched in September 2017. It was a three-year project which ended in December 2020 (including an extension of the project due to the COVID-19 pandemic). The research consortium consists of four partner universities: in Portugal (Escola Superior de Enfermagem de Coimbra, Belgium (Thomas More Turnhout), Slovakia (University of Ljubljana) and Finland (Karelia University of Applied Sciences, Karelia). Tampere University of Applied Sciences coordinated the project.

The context of the project was in nursing education and the main goal was to develop a DigiNurse Model. The model enables students to practice their digital coaching skills before entering the working life. Several studies show that existing curricula of nursing education include elements of patients' health promotion or guidance, but these elements are imprecise and not necessarily considered from digital learning and teaching perspectives (Mann, Medves & Vandenkerhof, 2015; Mather & Cummings, 2019). Through the development of the DigiNurse Model and its pilots, student nurses learn to use various digital and pedagogical methods, technical devices, online communication and international networking. All the acquired and tested skills are essential capabilities in implementing healthcare in the 21st century (WHO, 2015.) In addition, teachers and healthcare professionals who supervise students in clinical training are educated to utilize the model in teaching and guiding nursing students. The teamwork of the project members strengthens their cooperation, networks and personal relationships which will be made use of in the future.

This e-book on the DigiNurse project introduces the processes, results and versatile materials developed in collaboration with students, teachers and all the project partners. The content and sequence of the e-book reflects the progress of the project. All chapters follow the same structure: an in-

troduction, content, references and recommended reading where applicable. As an exception, the structure of Chapter 6 (The DigiNurse Model Integration into Curricula) is different. It starts with all partner universities introducing their institutions, and subsequently presenting the pilots and piloting experiences of each university. Finally, the chapter is concluded by a description of international piloting.

Chapter 2 describes the start of the project, the expectations and impact of the project results, and the start of implementation of the project. The course of the project process is presented in Figure 3, page 20. The following chapter (3) is focused on reviews of current research literature. These were extensively carried out to find key components for the model construction. Based on the project application, the project team chose three main areas for the review, namely pedagogical approaches, technological practices in education, and the best practices in digital teaching and learning. Diverse examination of the research literature generated enough variety to compare different pedagogical methods, coaching techniques and technological approaches, and resulted in determining the most suitable combination for the DigiNurse Model. The work was distributed among all project partners. In sub-chapter 3.1, the concept of coaching is discussed by the Belgium and Karelian teams, while in sub-chapter 3.2, the Slovenian team wrote about the pedagogical approaches used in the digital era. The TAMK team carried out an explorative inquiry of research literature published in the period 2013–2017 on the best practices in digital teaching and learning in nursing (3.3).

Chapter 4 introduces the philosophical and practical bases of the DigiNurse Model. The model basis consists of ethical considerations and evidence-based nursing, salutogenesis, positive health, a chronic care model and transversal skills required in the 21st century. Diverse and up-to-date

> "
> This e-book is a result of collaboration between the project team members from all partner universities.

literature has been used to define the concepts. The project team reached a consensus of the structure of the model in early 2020. At the beginning of chapter 5, the journey of developing a Common Model (5.1) is discussed and this is followed by a comprehensive description of the DigiNurse Model (5.2). Each concept contributing to the DigiNurse Model is presented based on theory and practical application, at the same time providing the reader with certain specific means and tools for using the model. The concepts of the DigiNurse Model include health literacy (5.3), self-management (5.4), digital care (5.5), coaching (5.6), coaching models (5.7) and technology and data care (5.8).

This project aimed at curriculum development and an enhancement of nursing students' digital competence in support of patients' self-management. During the development of the model, its' parts were piloted, which provided ideas for the improvement of the model. Simultaneously with the piloting, the integration of the model into the curricula of the participating universities was launched. Their experiences of the integration process are illustrated in Chapter 6 where subchapters are dedicated to explanations by the universities of how the integration was carried out at them (6.1 TAMK, Finland, 6.2 Karelia, Finland, 6.3 Thomas More Turnhout, Belgium ja 6.4 ESEnfC Portugal, and 6.5 University of Ljubljana, Slovenia). First, the universities present themselves to the reader. Subsequently, each partner university describes their pilot protocols and nursing students' experiences on the implementation of the DigiNurse Model. In addition to the experiences, chapter 6 contains suggestions for using the DigiNurse Model. Finally, each university presents its curriculum as a reference.

As the discussion section of this publication, chapter 7 summarizes the entire course of the project process. Challenges and achievements of the project are presented in relation to the expected results in a reflective manner (7.1). Subchapter 7.2 introduces the project's conclusions to the reader. Descriptions of the authors are available in Chapter 8 and appendices in Chapter 9.

This e-book is a result of collaboration between the project team members from all partner universities. The editorial board has adjusted the content of the articles for consistency and clarity. The teamwork and joint efforts have resulted in producing an international publication, which will hopefully aid curricula development and guide changes needed in the future. The collaboration and networking among universities from four European countries have provided new information, knowledge, skills, appreciation, friends and, above all, respect to the power of international cooperation.

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2 Description of the DigiNurse Project

Raija Kokko

In this chapter, I will shortly describe the start of DigiNurse project carried out in the period 2016–2018. The initial phase includes an idea generation phase and the submission of the project application. Furthermore, because the development of the DigiNurse Model started at a set-up meeting (Kickoff Meeting), I have included the beginning of literature reviews and the used survey to this chapter, as it was crucial to gain knowledge of the current literature on digital advancements in healthcare and nursing education. It was also important to investigate nursing students' perceptions of their digital competence and educational needs before starting the mode development process. The expected results and impacts affected the completion of project activities from the start to the end of the process.

Furthermore, the theoretical and philosophical concepts of the model were selected at the start of the project. At the end of this chapter, you will find a figure of the main features of the project process. I focused here mainly on the year 2018.

The start of the DigiNurse Project

The idea of the DigiNurse: ICT supported self-management of patients with chronic condition project was created in the UK at North Umbria University, Newcastle upon on Tyne, in 2015. While spending time at the university during an Erasmus teacher exchange, I met two teachers from the Karelia University of Applied Sciences (Karelia), and we decided to collaborate on something later. During our exchange, we also participated in a meeting with healthcare professionals employed by a local hospital and discussed issues such as e-health and related challenges, especially ones emerging in rural and remote regions of a country. E-health seemed to be an issue receiving a lot of current attention in the UK, and there was rapid advancement in the field in the country as well as in Finland.

After the exchange, we (myself and Päivi Sihvo of Karelia) started looking for a project and topic that would enable us to combine the strengths

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of both of these Finnish educational institutions. Tampere University of Applied Sciences (TAMK) had extensive experience of international projects and Karelia had many interesting ongoing digital projects in the digital health sector. Furthermore, many people in the Karelia region were living in rural and remote places, a a result of which some digital health services were being developed for them. We assessed the status of nursing education from the perspective of the digitalized health sector and current nursing education and decided to focus on curriculum development and enhancing the digital competence of student nurses. The word "competence" was used as a synonym for digital literacy when filling out the project application.

The next step in the process was to find project partners and make a choice on an appropriate funding instrument. We formed teams at both of the educational institutions to write an application. The teams used their existing relationships and experiences in international cooperation gathered in previous projects and teacher exchanges. As a result, we invited one university from Portugal (Escola Superior de Enfermagem de Coimbra), one from Belgium (University Thomas More Turnhout) and one from Slovenia (University of Ljubljana) to participate in the project. This selection made the resulting project consortium balanced: one of the participating universities was from the southern, one from the western, one from the central and two from the northern part of Europe. The Tampere University of Applied Sciences was tasked with coordinating all project activities. Finally, from all the potential funding instruments offered by the European Union, we chose Erasmus+ Strategic Partnerships for Higher Education. The consortium collaborated in preparing the funding application, although TAMK had the main responsibility for the writing process. The final version was sent to the EU at the beginning of March 2017 and a positive funding decision was obtained at the beginning of August 2017.

According to the application, the main aim of the project was to develop the Digi Nurse model for nursing education to enable patients' self-management of their chronic condition. The model was to contain concrete objectives for the learning skills needed in digital nursing and supporting patients' self-management, best teaching and training practices for learning to use digital tools, and the methods used in practice. In addition, the aim was to develop the concept of communication between the nurse and the patient, and evaluation criteria of digital skills in nursing and health promotion as the project work progressed.

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The expectations and impact of the project results

A review of the curricula of the participating higher education institutions showed that their courses in nursing education included teaching in digital subjects. However, there was a lack of a coherent plan for the digital support of patients' self-management, and previous international collaboration on this topic had been limited. In addition, there was an increasing need for digital support to promote patients' self-management due to the aging of the population and an increase in lifestyle-related diseases such as type 2 diabetes and obesity. Therefore, the consortium set teaching and learning objectives to respond to the need of a coherent plan for teaching and learning skills necessary in providing patients with training on using digital solutions. The objectives were taken into account when deciding on the results expected from the project (Figure 1). The expectations were viewed from the perspective of nursing education and students' learning of digital and communication skills for supporting patients' self-management. In addition, the expectations of teachers and working life were included.

The DigiNurse Model is ready and it helps students to learn and apply their digital and communication skills to support self-management through online coaching and use of mobile health tools is in use in participating universities.

The students gain better abilities to exploit digital skills in supporting and coaching self-management of the patients suffering from chronic conditions.

Evaluation of the digital skills of nurses and student nurses shows improvement.

The digital health literacy among nursing students has increased.

The teachers gain an effective model to organise the inclusion of building digital awareness and competence of their nursing students.

The working life receives new nurses with up-to-date skills in digital supporting aids and methods of nursing tasks with self-management of patients.

The patients get better support for their self-management of their condition when the nurses can coach and support them better with available digital tools.

The European ICT companies get valuable feedback on their products.

At the end of the project the DigiNurse community has expanded beyond the participating institutions.

FIGURE 1. The expected project results during and after the project implementation

The expected project outcomes affected the determination of the impacts of the project during and after of its completion. The impacts included the expected results at the local, regional, national, and international level (Figure 2).

LOCAL
- DigiNurse model is tested and finalised
- Student nurses have successfully participated in the DigiNurse curriculum
- Testing and training staff are convinced of the added value of DigiNurse in a curriculum
- Awareness of preventive nursing interventions has increased

REGIONAL & NATIONAL
- DigiNurse Community expands to other institutions of higher education in the participating countries
- DigiNurse Model will be adjusted to be used in curricula for other health professionals

INTERNATIONAL
- DigiNurse community expands to other countries in Europe
- DigiNurse experience is shared among the international community
- Better connections with European ICT companies

FIGURE 2. The expected main impact of the project results during project and afterwards in Local, Regional, National and International levels.

The final project results can also be viewed under the concept of intellectual output (IO). Intellectual output summarizes the expected project results and impacts. Three intellectual outputs were determined for the DigiNurse project. The first output (IO1) was the DigiNurse Model. The second output (IO2) was called the DigiNurse Community, which would be established after the completion of the model. The aims of the community include organizing webinars and national training seminars to nursing students, teachers and stakeholders in the partner countries. The third intellectual output (IO3) consisted of the DigiNurse Guidelines. These guidelines would work as a guiding document enabling getting the most benefits out the DigiNurse Model. They include a compilation of the best practices of using the DigiNurse Model.

The implementation of the project was planned to consist of six transnational meetings. The project work was divided into six work packages, and providing each partner with the leading role of one of the work packages. As the responsible project coordinator, TAMK had two work packages, the Project Set-up and Management and Quality Assurance. The Belgian partners led the development of the DigiNurse Model, while the Slovenian and Portuguese partners were in charge of the piloting phases of the model. The Portuguese partners also played a leading role in the dissemination of the project results. Each partner organized multiplier events for the dissemination of the results. All work packages included activities carried out to promote goal achievement. The final evaluation of the transnational work will be completed at a management and quality assurance meeting held in December 2020.

> The implementation of the project was planned to consist of six transnational meetings.

Starting the implementation of the project

At a set-up meeting 2017 in Tampere, Finland, the project participants decided to explore the current literature of the components of the DigiNurse Model. These components included the best practices in digital teaching and learning, self-management support and empowerment of patients, coaching techniques, and models of technological practices.

As the project participants agreed that the DigiNurse Model was based on evidence-based knowledge, research literature was not only used in reviews but also throughout the whole model designing process. Evidence-based practice (EBP) provides nurses with a method to use critically appraised and scientifically proven evidence for delivering quality healthcare to a specific population (Majid et al., 2011; Elf et al., 2015) (More information in Chapter 4.1). The concepts of positive health and salutogesis (Mittelmark et al., 2017) which include an idea that individuals can make independent decisions on matters concerning their lives, formed part of the philosophical basis of the model. While ethics is intertwined with the whole structure of the model, extra attention was paid to Nurses' Ethical Code of Conduct (NMC, 2018) and General Data Protection Regulations (GDPR, More information in Chapter 5.8) (Regulation 2016/679/EU). Because the aim of the project was focused on teaching and learning digital support tools and methods for the self-management of patients with chronic conditions, the concept of chronic care was one of the basic elements in the model development. The transversal skills of the 21st century were not discussed at the start of project but were introduced later, as the development of the DigiNurse Model advanced.

The consortium decided to develop a questionnaire with 45 questions exploring student nurses' perceptions of their digital competence, skills of patients' self-management support and digital practices. The universities conducted the survey mainly in 2018, and the sample size was 857 respondents. The results of the survey showed that while students had experience in digital courses, they felt that they needed advance their theoretical as well as practical skills. The results were utilized in the development of the model.

The reviews produced valuable information about the components of the model and students' perceptions of their current digital knowledge level, and teaching and learning needs. This information was necessary when designing the structure of the model. The main features of the progress of the projects are introduced in Figure 3.

Graduating students are equipped with digital coaching skills

3rd year

Integration into Curriculum

Implementation Phase

Pilots of the model: national, international

The DigiNurse Model is ready

Quality Digital Coaching regarding Self-management of Patients' with Chronic Condition

2nd – 3rd year

Visual drafts of the model

1st year

First drafts of the Model

1st year

Survey: questionnaire for students

Pedagogical and technological basis:

Literature reviews:
Best teaching and learning practices
Pedagogical models
Technological practices/models

Theoretical and philosophical basis:
Evidence-based knowledge, Salutogenesis, Positive Health,
Chronic Care Model, Ethics: Nurses' Ethical Code of Conduct,
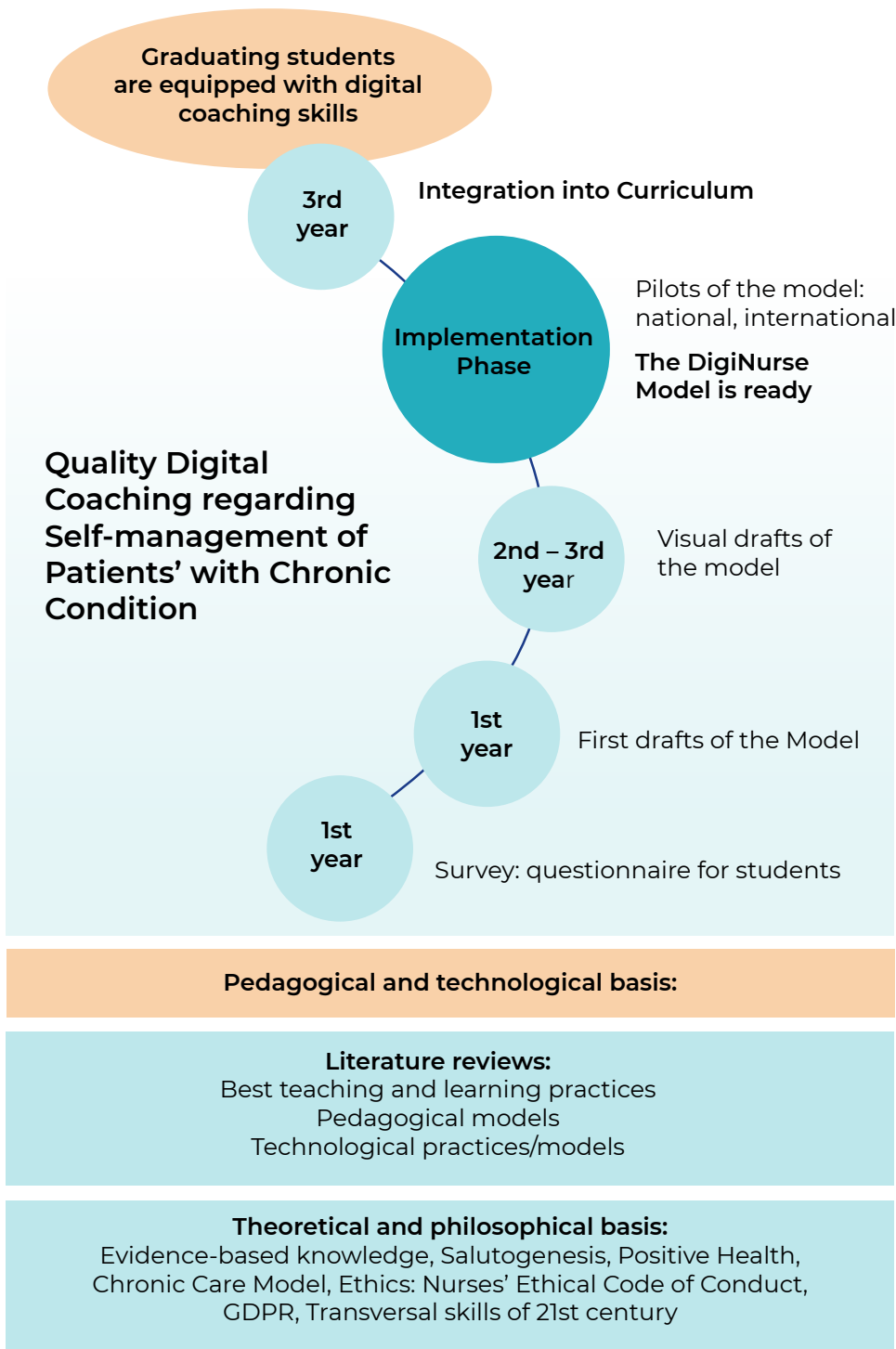GDPR, Transversal skills of 21st century

FIGURE 3. The main features of the progress of the project

Conclusion

The DigiNurse project process started in November 2017. The set-up meeting showed that the project team had potential to achieve the project goals. In Chapter 5, the development and structure of the model are described in detail.

Recommended reading:

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3 Explorative Inquiries of Research Literature in 2013–2017

The pedagogical and technological foundation of the DigiNurseModel consists of literature reviews and a theoretical and philosophical basis. In this chapter the explorative inquiries are introduced. These reviews analysed the current research literature of the main concepts for the DigiNurse Model. The researched concepts included best teaching and learning practices, pedagogical models and technological practices and models.

In the following chapters the processes and synthesis are described on the explorative inquiries of the research literature in 2013–2017. The topics covered were the concept of digital coaching, pedagogical approaches in the digital era and the best practices in teaching and learning digital nursing. Also, technological tools were researched and the article presenting the results was published in Gerotechnology Journal 2018 (Parreira et al., 2018) (More information in Chapter 5.8).

3.1 The Concept of Digital Coaching

Pirjo Vesa, Hanish Bhurdun and Dorine Nevelsteen

The concept of digital coaching in the health and social care sector is increasingly being used as a means to identify technology-based automatic interventions. However, it differs to some extent from the multimedia psycho-educational programmes or other health-related information that may be sent electronically to customers (Strecher, 2009). Furthermore, optimising resources is a key factor driving the health and social care sector. At present, online consulting can be quick and less expensive, more scalable and largely customised.

Properly implemented, digital coaching can be extremely beneficial to customers. Likewise, serious gaming and gamification have been identified lately as an important resource to provide and establish better care. The PERGAMON platform is an example of a model that has been developed for digital coaching in supporting patients (Klaassen et al., 2016).

The introduction of these new platforms in the health and social care industry comes with its challenges, e.g., online security and privacy can be a concern. The scope of this systematic review is to investigate existing literature in the field of digital coaching in the healthcare sector.

Methods

The search strategy of this review is based on the relevant criteria from the preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) statement of 2009 (Moher, Liberati, Tetzlaff, & Altman, 2009).

Five databases have been identified:

1. CINAHL, because the search topic is related to nursing and related healthcare professionals
2. PUBMED, because it mainly encompasses literature about medicine and related healthcare
3. SCOPUS, because of its comprehensive amount of literature related to medicine and social sciences
4. MESH, because of its wide range of indexed materials and literature in healthcare and the field of social sciences
5. ERIC, because of its wide range of indexed materials.

Test searches were performed with keywords that may refer to the concept of "digital coaching in healthcare" to understand the range of results. Thereafter, the planning of keywords was performed carefully in order to reduce the limitation of unrepresentative search results.

The final keywords that were used in all databases were digital coach, health education, healthcare, digital support, digital counseling, digital guiding, digital training, digital health interventions, digital monitoring and gamification. The search keywords were used in different combinations in a pre-formulated formula and using the exact words on the title, as these may address the review in question. Additionally, a manual search was conducted to expand on the current electronic searches. All searches were carried out using the same inclusion and exclusion criteria (Table 1).

TABLE 1. The inclusion and exclusion criteria of the literature review

Inclusion criteria	Exclusion criteria
Articles published after 2012	Opinion pieces
English language publications	Non-English language papers
Peer-reviewed research	
Content related to the topic in question	

All the records included in the literature review had to be published in English after 2012, peer-reviewed and related to the topic in question.

Search outcomes

The reference management software Refworks ProQuest was used to sort the records. After the removal of duplicates, the remaining records were assessed for relevance by the searcher based on abstracts. Subsequently, we identified 17 records that met the criteria of this systematic review. The process used to reduce and evaluate the records is illustrated in Figure 4.

" The concept of digital coaching in the health and social care sector is increasingly being used as a means to identify technology-based automatic interventions.
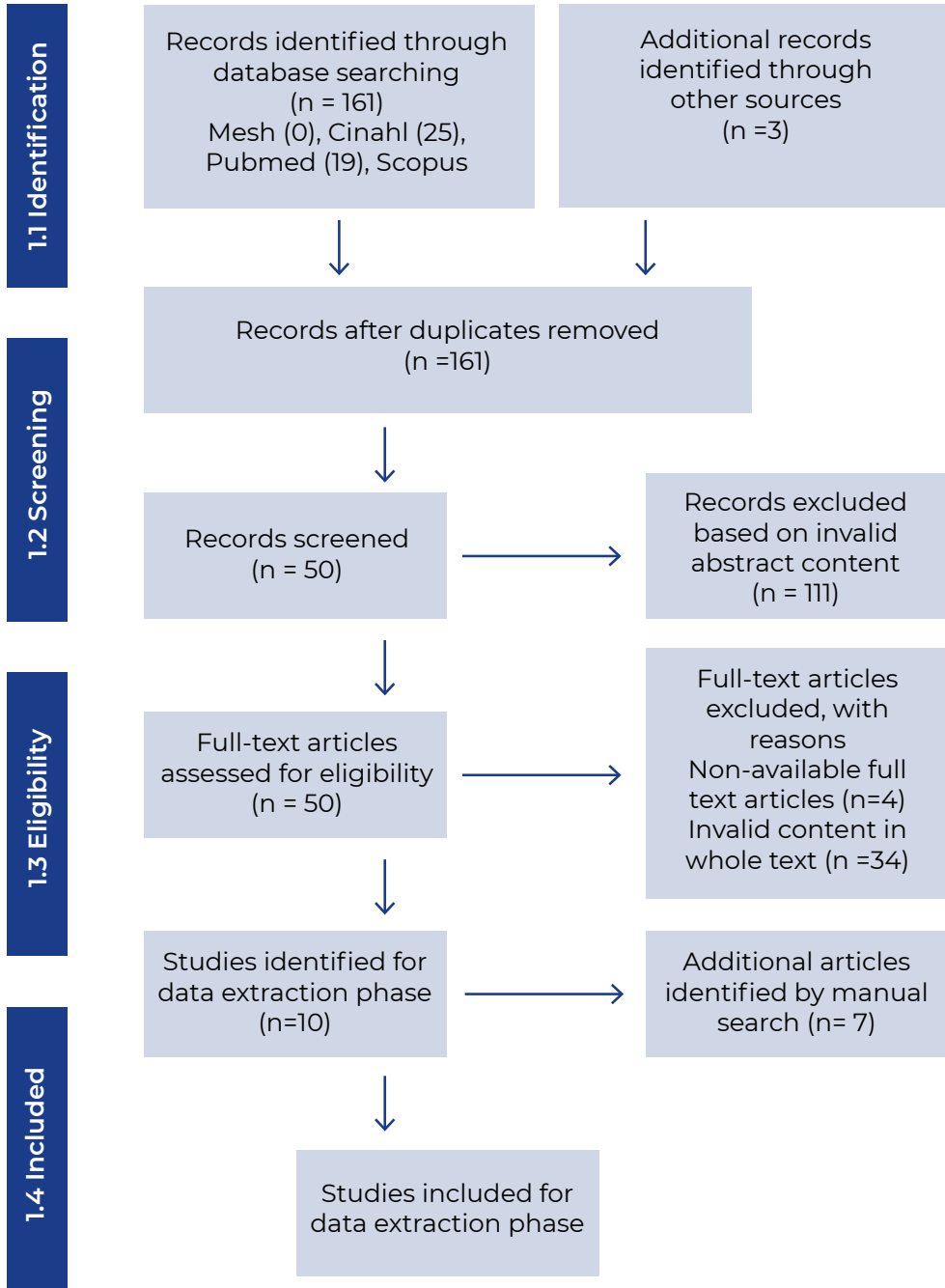
PRISMA 2009 Flow Diagram

Records identified through database searching
(n = 161)
Mesh (0), Cinahl (25), Pubmed (19), Scopus

Additional records identified through other sources
(n =3)

Records after duplicates removed
(n =161)

Records screened
(n = 50)

Records excluded based on invalid abstract content
(n = 111)

Full-text articles assessed for eligibility
(n = 50)

Full-text articles excluded, with reasons
Non-available full text articles (n=4)
Invalid content in whole text (n =34)

Studies identified for data extraction phase
(n=10)

Additional articles identified by manual search (n= 7)

Studies included for data extraction phase

FIGURE 4. Prisma chart of the Concept of Digital Coaching

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Data extraction and synthesis

All 17 articles included were quantitative, qualitative and RCT studies. The summary of challenges and recommendations in developing a digital coaching model are presented in Table 2.

Table 2. Summary of challenges and recommendations in developing a digital coaching model

Summary on the challenges in developing a digital coaching model	Summary on recommendations in developing a digital coaching model
Users of digital coaching can be the main challenge in developing a successful digital coaching model.	Digital training is recommended for the users and tutors of digital coaching application
Participants might lose interest during the implementation phase	Keeping the users of such digital coaching application engage by making sure they understand the benefits of such models to improve their health or education in health science
Users stopped using the virtual coaching after the study completed	Having the user's needs to have a sense of self-control for digital coaching can improve the acceptance of such models
Coaching software were complex and not fit for purpose or could not fully tend to requirements	Tailor made virtual coaching for specific groups is recommended, as virtual coaching has shown to increase enthusiasm among students in learning and understanding how to deal with complex unexpected events

27

Conclusion

According to the articles, though digital coaching is a beneficial tool in healthcare, it is a new method which has not been deeply investigated yet.

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3.2 Pedagogical Approaches in the Digital Era

Marija Milavec-Kapun and Tina Gogova

Digital development is making great strides worldwide and has presence in the educational sector as well as in healthcare. Today, higher education institutions are faced with increasing student expectations through demands for the personalisation of students' study experience, a reliable technological infrastructure, digitally literate staff and support for the development of employees' digital literacy, which contribute to the emergence of new learning and teaching models. Today's students are no longer satisfied as being passive listeners of lectures but instead want to actively participate in acquiring knowledge. They need and want more active and collaborative forms of learning. 21st century or modern learning is student-centred learning focused on the acquisition of abilities, skills and experience, which enable students to combine both acquired theoretical knowledge and practical skills. This allows the students to acquire a higher level of knowledge, understanding, critical thinking and decision-making for the benefit of the patient.

Education over the years

Over the last 40 years, learning theories and pedagogical models, approaches, and learning practices have gradually changed. Traditional education in the form of lecture theatres, when access to knowledge has been limited, has changed dramatically in recent decades with regard to our understanding of what effective pedagogies are. Every tool used during teaching contributes to some changes in the education process. The development of digital technology and the information superhighway, which are available anytime and everywhere, change teaching dramatically and very rapidly.

Traditional lectures, based on a largely transmissive and behaviourist model of instruction, do not meet the needs of today's students. They need and want more active and collaborative forms of learning than before. Lectures in the form of ex cathedra are now being replaced by new academic tools such as desktop computers, laptops, touch controls, audio-visual projections, interactive displays, (Pates & Sumner, 2016) and

clinical virtual simulation (Padilha, Machado, Ribeiro, Ramos & Costa, 2019). Traditional, passive forms of teaching have converted to modern, active approaches (O'Neill & McMahon, 2005), communication and the way of cooperating with students have changed, and access to information has changed dramatically, which plays an extremely important role in learning (Oyediran-Tidings, Onidari-Okemwa & Nekhwevha, 2017).

One of the major changes which have taken place over the years is the changed role of both students and teachers. The new educational paradigm introduces active forms of study (Kermavnar & Govekar-okoliš, 2016) and puts the student (and not the teacher) at the centre of the education process (Santos, Figueiredo & Vieira, 2019). They are at the centre of events, involved in the process of developing independence and empowerment (Allen, 2010), while the role of the teacher is to prepare appropriate learning conditions (Karnjuš & Pucer, 2011) to guide, advise and support students through the learning process and to provide feedback (Fekonja, 2009). Furthermore, this has also changed education and the pedagogical methods of learning, which greatly stimulate the active participation of the student in the educational process in nursing education as well.

The education profession is constantly seeking to properly respond to the demands of modern society and to shift with the ever-changing cultural and technological environment. Effective teaching can be a major challenge and requires high pedagogical qualification of higher education teachers. The teacher should know and use different learning theories as well as different didactic and pedagogical approaches or models adapted to the student's needs and role in order to be able to create a positive learning environment and at the same time establish contact with their students.

Learning theories

Understanding the concepts of learning theories is highly important in order to teach and learn effectively. We will briefly present the basic theories of learning which have focused on different types of learning. These are behavioural, cognitive, constructivist, and connectivism learning theories.

Behavioural theory assumes that a particular stimulus will elicit a particular response and that learning is determined by external factors. These factors will help reinforce the participant's behaviour in an expected way. If

> One of the major changes which have taken place over the years is the changed role of both students and teachers.

students are motivated and teachers clearly communicate their messages, learning will happen. A reward or punishment can strengthen the connection between a stimulus and a particular response. This theory assumes that human behaviour is predictable and controllable.

Followers of the cognitive theory believe that mental processes, i.e. inner and conscious representations of the world, are essential for successful learning. In this theory, the focus is on the internal thought processes of a learner and not only on the observable behaviours. An individual is an active participant in the learning process who deliberately tries to process information obtained from the outside world. Therefore, the basic characteristics of cognitivism are a search for rules, principles or relationships in the processing of new information and finding meaning in reconciling new information with prior knowledge. Hence, learning is not merely about the change in a learner's behaviour; it is about a change of knowledge stored in the learner's long-term memory. (Dilshad, 2017.)

Constructivism helps promote a more open-ended learning involvement where outcomes and methods cannot be easily measured and which may not be the same for every learner. Behaviourism and cognitivism analyse a task and break it down into manageable small portions to establish objectives and measure performance based on those objectives. In constructivist theory, learning is primarily understood as a social process, which requires communication between various participants, e.g., teachers, students, colleagues and friends. Knowledge is acquired in the social process or in the institutions created by society. Knowledge is not only a content but also an expression of values. Therefore, knowledge must be constantly researched and critically assessed. An individual consciously

strives to understand their environment in the light of experience and current condition. The process of learning is non-linear and complex. Constructivism theory is based on scientific study and observations of learners' learning styles, past experiences and ideas. Learners must be actively involved in the process of asking questions, exploring and assessing what they already know. This enables teachers to discover whether the learners accept or discard the new information. (Dilshad, 2017.)

In connectivism, knowledge is distributed by human, social and technological networks, and learning is a process of connecting, growing and managing these networks. This theory is based on the theory of chaos and on the importance of networks or interconnection in modern society. Learning is a process taking place in changing environments, over which individuals have no influence. Knowledge is present in various networks (computer, social). In modern society the most important thing is to be able to connect different sources of information. This integration allows us to learn more and is more important than our current state of knowledge (Siemens, 2005). In connectivism, the starting point for learning occurs when knowledge is actuated by learners connecting to and participating in a learning community. Learners have potential access to various dynamic and interconnected resources, enriched by all members of the community and technology. Learners connect to a network to find and share new information, to modify their beliefs in relation to their new learning, then reconnect again to share their new understandings and to find further information. The main pedagogical method of connectivism has been utilised on massive open online courses (MOOCs). Since nowadays information is constantly changing, learners need to be able to access new information, to evaluate it and its relevance, and to make decisions based on the information acquired. An important skill contributing to learning is students' ability to find current information and filter it in order to extract irrelevant, secondary and foreign information (Goldie, 2016).

Various learning theories are pointing out differences of learning between students, and they are emphasising students' own, unique way of learning. Different approaches to teaching should be used according to different learning needs in different contexts. It is necessary to identify appropriate ways of learning for individual learning tasks and groups of participants and then decide how to use technology to meet these needs (Dunlosky et al., 2013).

Pedagogical models and approaches to the patients

Pedagogical models for teaching students are intended as a tool for the professional preparation of students. Over time, several pedagogical models and approaches have been developed, which provide tools for teachers and students for organising education as well as utilising digital technologies. All of these models are integrated into teaching and learning, e.g. communication with patients (Figure 5).

CEE	• Connection-Engagement-Empowerment • Online course design model
OCL	• Online Collaborative Learning Theory • Online course design model
GROW	• Goal Reality Options Will • Coaching model
RE-GROW	• Re - Goal Reality Options Will • Coaching model
EMMA	• Empowerment, Motivation, Medical Adherence • Coaching model
5Ds	• Discovery, Design, Development, Delivery, Debriefing • Collaborative model for learning design

FIGURE 5. Pedagogical online course design and coaching models (CEE, Yearwood, Cox & Cassidy, 2016; OCL, Harasim, 2012; GROW, Grant 2003; Re-GROW, Clow & Tiernam 2011; EMMA, Varming et al., 2015; 5Ds, Budd, 2016)

> Pedagogical models help teachers systematically understand, predict and design how learning occurs.

Traditional pedagogical models focus on knowledge, skills and attitude development. With a teacher as a guide and with learner-centric approaches, nursing students are supported in the development of their deep learning, competence and metacognitive skills (Weeks et al., 2019). For nursing students and healthcare professionals, it is desirable to achieve clinical competence (e.g. assessment ability, clinical judgment), general competence (e.g. critical thinking ability, communication skills, conflict resolution skills) and moral competence (living in accordance with professional duties and a personal moral code) (Trobec, Čuk & Istenič Starčič, 2014). The workload in healthcare is increasing every year and patient care is becoming increasingly complex. Therefore, it is extremely important that educational institutions implement teaching and learning methods that facilitate nursing students to acquire the capacity for critical thinking, clinical reasoning and problem solving. These abilities are crucial prerequisites for providing advanced nursing practice. Pedagogic approaches, e.g. problem-based learning (PBL), challenge students to find activities towards solving the clinical problems and develop problem-solving abilities (Dale & Dale, 2017).

Pedagogical models help teachers systematically understand, predict and design how learning occurs. New learning scenarios are needed to cope with and benefit from changing circumstances using a participatory and interactive approach supported by ICT-based tools (Bidarra & Rusman, 2017). The modern educational system must prepare the students for the developing scientific, technical and technological components of society, the increasing amount of information that a modern professional need for analysis and the trends in the network of the global professional community. Under these conditions, the pedagogical model of integrative-mod-

ular training is designed to prepare students to solve such problems (Abramova, Shilova, Varankina & Rubanova, 2019).

Different approaches to teaching are important in the learning process. Rapid development of different mobile applications support the learning process and are accessible regardless of time and place, and they can improve students' learning outcomes and support in a variety of ways (Moebert, Zender & Lucke, 2016).

Technology-assisted learning in healthcare

Active forms of learning with ICT have been detected to have a positive influence in the acquisition of students' knowledge and skills about health. Technology itself is not a solution to effective education, but its use can be supportive (enables flexibility and self-directed learning), especially in a blended learning approach (Anolak, Coleman & Sugden, 2018).

With rapid technological progress, the need for lifelong learning and continuing adaptation to keep up with the pace of change has emerged. Current healthcare systems and practices are changing faster than ever before. Technological development and advances in health science are forcing education systems to progress. Flexible development of new approaches to educate future healthcare providers will generate the skills they need to meet the requirements of the demands and challenges of an active patient. Therefore, a new conceptualisation of educational models adapted to challenges is needed.

Modern pedagogy transforms teachers from in-charge experts to guide-facilitators, which requires them to abrogate claims to knowing all and instructing students on what they believe students should be told. The teacher should be willing to listen, discuss, be patient, observe, urge, guide and reorient without focusing only on predetermined classroom outcomes or the clinical environment. This facilitation process should be student-centred and encourage them to follow teacher instructions and prompts. Efforts to facilitate the learning process include guidance, not supervision; knowing, but not necessarily stating; using dialogue without necessarily providing the only or best answer; and monitoring students when they are on a potentially productive learning path. It is the teacher's responsibility to create an environment where both student and learning are focused and conducive to meaningful engagement. The more diverse the use of teaching methods is, the greater the likelihood that the teacher will respond to most (or all) of the learning styles of the diverse students

present in in the classroom. Teachers can have a powerful influence on the experience of students and should provide a solid foundation for shaping positive learning experiences for nursing students. Developing trust helps develop a safe and supportive learning environment, which is essential for learning (Horsfall, Cleary & Hunt, 2012).

Using technology in education is one of the strategies to make students more involved in the learning process. Sheikhaboumasoudi et al. (2018) have stated that by using new and flexible approaches of e-learning, educational content is made faster more effectively and more economically. E-learning can stimulate students' activity, individual learning and repetition of educational content in proportion to the needs and requirements of individuals. It promotes independence, flexibility, organisation, determination of the speed of learning and practical learning of computer skills. E-learning can be used as one of the complementary methods in traditional training.

A strong value system and social skills including cooperation, sharing, expression and respecting other's views are more easily developed in the traditional mode of face-to-face (F2F) teaching (Lalima & Lata Dangwal, 2017). Therefore, it makes sense to use the benefits of both the F2F approach and the ICT or e-learning. This can be accomplished in blended learning, which is an innovative concept that embraces the advantages of both traditional teaching in the classroom and ICT-supported learning. It has the capacity for collaborative learning, constructive learning and computer-assisted learning (Lalima & Lata Dangwal, 2017).

Skills and competences

When using a virtual learning environment, prior and greater use of theoretical content is encouraged, which makes the classroom experience more dynamic and arouses the student's interest in independent learning. The advantage of using modern technology is in the case of distance learning, that the student can decide for themselves what and when to study certain content, as well as where.

In nursing education extra attention should be paid to learning various communication techniques and good knowledge and skills in ICT technology. A smart learning environment at nursing schools is recommended so that students are able to get acquainted with technological devices and during their clinical training with assistive technology. Through these activities, nursing education will be able to prepare future-proof nurses with

digital competencies.

All our goals are focused on the development of skills and competence of students of nursing care. The pedagogical models and approaches presented can be used to develop these competences in a student.

The '21st Century Competences' (Voogt & Roblin, 2012) that cover major competences for success in a digital and networked world are creativity, critical thinking, problem-solving and productivity (Figure 6).

Creativity

Ability to develop from scratch new solutions to emerging problems (communication, digital literacy)

Critical thinking

Capacity to read, interpret and evaluate new information (citizenship, communication, digital literacy)

Problem-solving

Ability to make decisions and implement the best solutions (communication, collaboration, digital literacy)

Productivity

Ability to be more productive and apply higher level skills (ICT competences are important here)
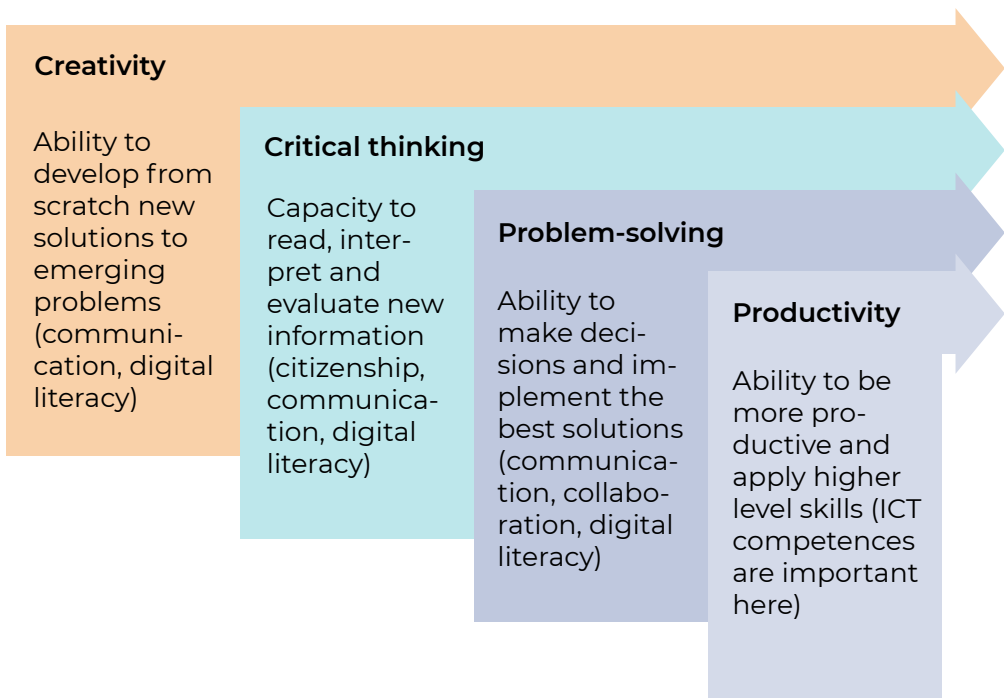
FIGURE 6. The '21st Century Competences'.
(Bidarra & Rusman, 2017, modified)

Critical thinking is an important part of clinical reasoning which involves the ability to use skilful thinking in the analyses, assessments and judgements in the process of clinical reasoning. Clinical reasoning refers to the nursing process that consists of assessing, planning and implementing care based on identified patient needs, so the development of clinical reasoning skills is essential for delivering competent patient care (Dale & Dale, 2017).

Smith and Foley (2016) have stated that the educational model of the future will be a hybrid model of experienced faculty, interactive learning and innovative and emerging technology. Therefore, it is crucial for nursing education to respond to this need so that future nurses will be prepared with the competence of digital nursing. In addition to acquiring theoretical knowledge, nursing students must also acquire skills and competences in the care of patients. Given the development of technology, it is very important to follow this development and use new digital approaches to increase the motivation of nursing students and improve their digital literacy and knowledge and skills in working with patients. On the other hand, it is also necessary to provide modern classrooms adapted to this type of learning.

Academic staff should receive high-quality pedagogical training for developing key competencies for excellence in teaching. The best teaching should support the development of students' critical thinking, creativity, ethical responsibility and commitment to lifelong learning. Consequently, we designed the DigiNurse teaching model, which is designed for student learning by teachers (and vice versa) and for patient learning by students. With the DigiNurse Model you can integrate ICT-supported nursing for the self-management of patients into the nursing curriculum.

Characteristics of different type of digital users

Nursing students and their teachers as well as patients differ in the degree of use and inclusion of digital technologies in everyday life. This affects their digital literacy and attitude towards digital technologies. The following describes the basic characteristics or levels of the use of technologies, which are partly age-related.

Digital natives

Prensky (2001) set a milestone for people born after 1980, describing them as digital natives or the Net generation. With the intensive digital development over the last 20 years, new forms of interactions in the virtual

40

world and connections with the Internet are emerging. Hoffmann et al. (2014) identify digital natives as young people under the age of 25 who are mostly still in school. They are active on the Internet: creating profiles on various platforms and publishing multimedia content,and sharing thoughts and ideas. They enjoy using the Internet. Digital technology and the (virtual) environment of young people have also influenced the development of the structure and functioning of the brain throughout their lives, thus changing our cognitive abilities (Figure 7).

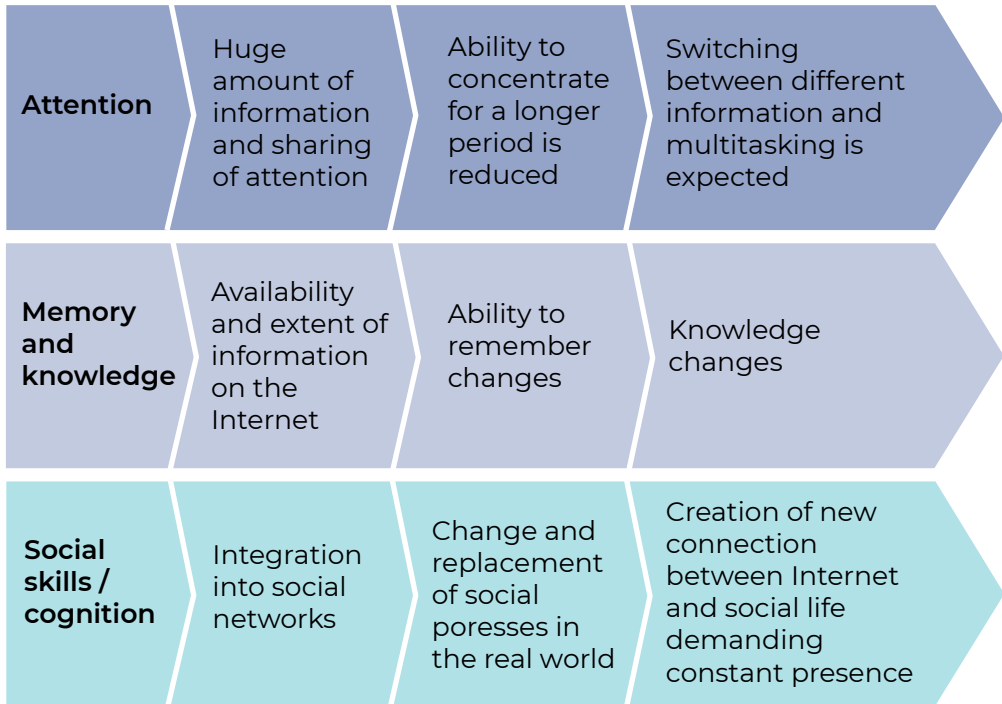| Attention	Huge amount of information and sharing of attention	Ability to concentrate for a longer period is reduced	Switching between different information and multitasking is expected
Memory and knowledge	Availability and extent of information on the Internet	Ability to remember changes	Knowledge changes
Social skills / cognition	Integration into social networks	Change and replacement of social poresses in the real world	Creation of new connection between Internet and social life demanding constant presence

FIGURE 7. Main influences of ubiquitous digital world (Firth et al., 2019, modified)

Digital natives as students, however, want a personal and deep relationship with the teacher, which does not necessarily always mean face to face. In online education, it is necessary to sensibly choose techniques and intertwine and complement them to achieve the desired effect (Dunlosky et al., 2013). For teachers, it is difficult to keep up with extremely rapid changes.

Digital immigrants

Digital immigrants were born before the digital era (Prensky, 2001), most of them are over 45 and many are over 65 (Hoffmann et al., 2014). They usually have a lower education status; they are passive when it comes to collecting information on the Internet and do not enjoy using new things or going online. Most patients with chronic diseases and a few teachers belonging to this generation could be considered part of this group.

During the education process we should recognise this group, and as teachers we should equip students to address the needs of the patients of this generation. That is quite a challenge for teachers. Some of them learn and adapt better than others to the new environment and reality, and these we can call naturalised digitals.

Digital immigrants as patients pose a challenge for healthcare professionals to adapt their operations to the new work environment and patient needs. As a result of living in the virtual world, young people have formed different values, and their relationships and way of communication and lifestyle have changed (Lei, 2009). They have different, even unknown health issues. The number of chronic conditions among young people is also increasing.

Naturalized digitals

Naturalized digitals are somewhere between the above two groups: most of them are between 26 and 65 years old, are highly educated and mostly employed. They use a combination of social and traditional media. They are more active on the Internet and are almost as competent and skilled as natives; confident in their ability to share thoughts and ideas online. They have transformed themselves from digital immigrants with appropriate environmental support and self-initiative incentives. Mostly they are experts; they are active and more or less everyday users of digital technologies (Hoffmann et al., 2014).

Teaching nursing students

The intensive development of digital technologies in healthcare creates the need for nursing students to acquire knowledge and skills to use technology to provide quality professional care to patients with chronic non-communicable diseases in their self-care and self-management. Digital technology is familiar to young generations of nursing students, but research reveals their digital health literacy skill as being low. In order to positively influence the use of technologies in nursing, we need to use modern pedagogical approaches and models. When choosing theoretical models for teaching nursing students, we need to choose between those that will provide support to teachers and also to students in understanding their role and using digital technologies in their professional work with patients. Thus, the models must include organisational, educational and professional elements that will encourage the development of students' digital health competencies and support their professional growth. Also, the characteristics of a digital teacher (Figure 8) are important and developing on demand.

With the increasing availability and usability of digital technologies, patients will increasingly resort to digital technologies in healthcare, so it is the task of healthcare professionals to empower them to choose the right one and use it successfully. The advantages of its use are that healthcare professionals in their professional work proceed from the patient and their needs and help them set personal goals and find resources to solve issues / problems.

In addition to knowledge, the attitude of professionals towards digital technologies is also important for the successful use of technologies in healthcare. The biggest challenge for teachers is to provide students with knowledge about the characteristics and ways of approaching patients with chronic non-communicable diseases and encourage them to develop skills to use available digital technology to manage their health condition more successfully. Cultural competences and sensitivity to the patient and their family and their needs are also important in digital health coaching. By using modern technologies and appropriate pedagogical approaches to teaching about their use, in the treatment of patients with chronic non-communicable diseases, we can have a long-term positive impact on the effectiveness and efficiency of healthcare.
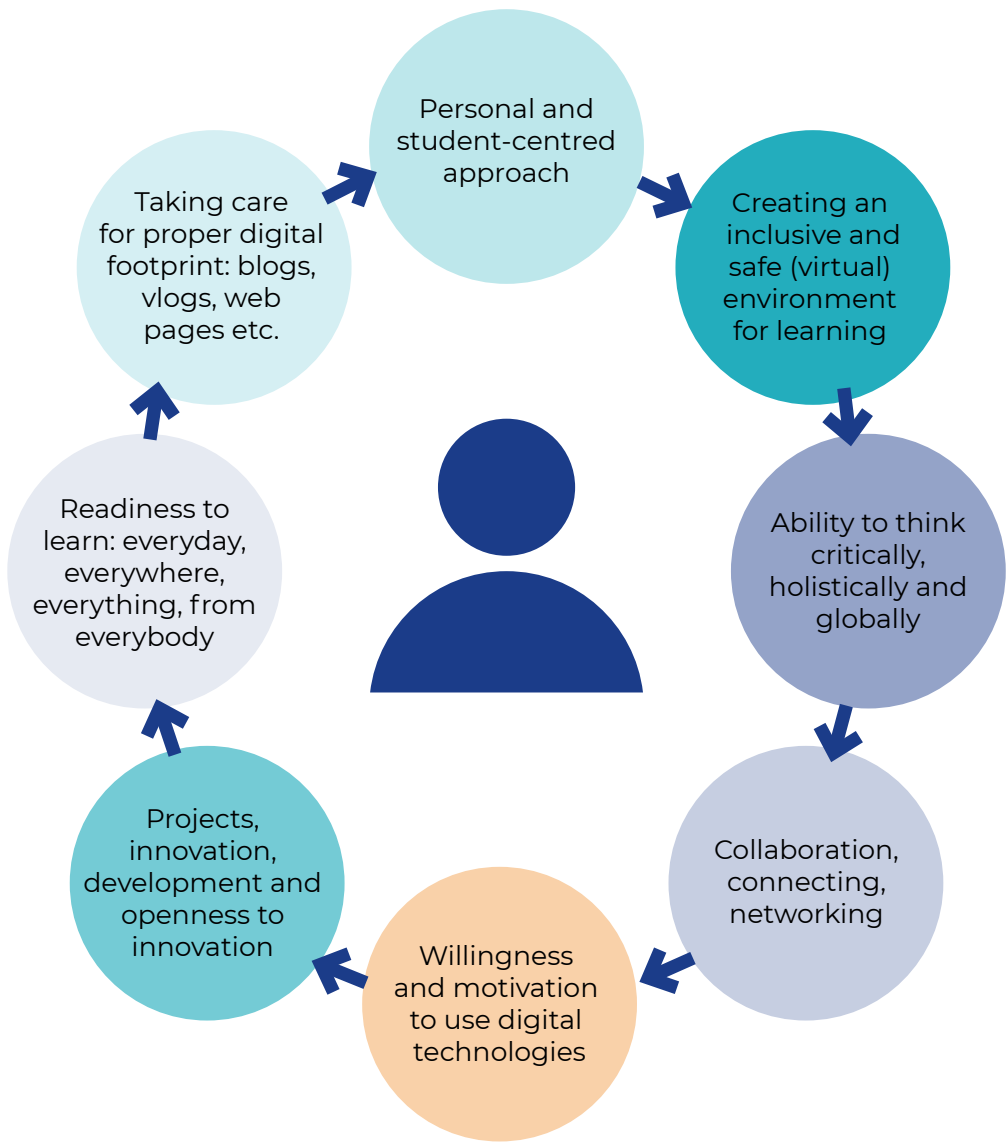
FIGURE 8: Characteristics of a digital teacher

Practical advises for teachers to develop their digital pedagogics:

- Search for a national agency for education and find out what kind of support you can get from them for your digital teaching.
- Start using (new) social media tools to connect with students or/with colleagues.
- Get yourself familiar with different digital tools for patients and try to use them during the teaching process. You can do this with students during the teaching process.
- Ask students which digital tool they suggest using next time.
- Explore and include in teaching at least one new tool per year, share your experience with colleagues.
- OECD and teaching; participate in the TALIS 2024 survey http://www.oecd.org/education/school/teachinginfocus.htm

Conclusions

An effective use of active forms of education is only possible in a safe environment that allows the active expression of ideas and opinions of students and which is characterised by a commitment to a common goal and professional student-teacher connection.

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3.3 The Best Practices in Teaching and Learning Digital Nursing

Raija Kokko

Digital and online teaching and learning methods are increasingly used in nursing education. Health, information and technology literacies belong to the fundamental skills of future workers in the 21st century (Stauffer, 2020). Digital skills are defined broadly. According to the UK definition, the 21st century contain essential abilities that are needed in the future in professional work (Figure 9) (Ascentis, 2019).

The abilities to use devices and handle information include for instance the identification and use of appropriate resources to maintain and improve digital skills. Creation and editing skills mean that a person knows and understands terminology and concepts relating to image editing and enhancing. Communicating abilities consists of the identification and use of appropriate modes of online communication for a range of contexts and audiences. Transacting abilities refers to skills that a person can use while buying online services safely. The ability of being safe and responsible online means, among other things, that a person is capable of applying simple methods to avoid physical and psychological health risks while using devices. These essential skills are presented in Figure 9.

> " The abilities to use devices and handle information include for instance the identification and use of appropriate resources to maintain and improve digital skills.
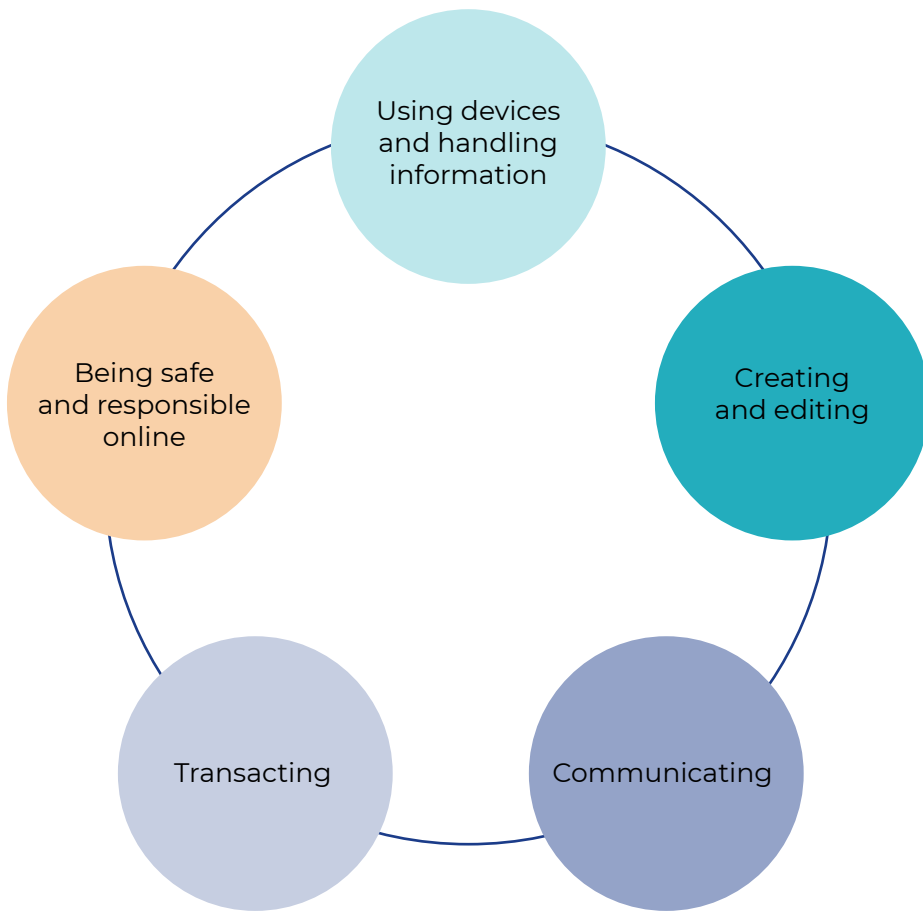
FIGURE 9. Essential digital skills in 21st century (Ascentis, 2019, modified)

In UNESCO terms digital skills are defined as a range of abilities to use digital devices, communication applications, and networks, to access and manage information. They enable people to create and share digital content, communicate and collaborate, and solve problems for effective and creative self-fulfillment in life, learning, work, and social activities at large. (UNESCO, 2018.) Often digital and online skills are used as synonyms. The both definitions are close to each other and contain digital and/or online skills and they both work as a framework of this review.

The advances in digitalisation in healthcare have been rapid. However, information about the best teaching and learning practices and methods,

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and students' perceptions of them, have received less attention in research from the perspective of nursing education (Koekeritz, Malkiewicz, & Henderson, 2002). This chapter introduces literature review findings published in 2013–2017. The aim of the review was to answer the question "What best digital or online practices are described in the literature for teaching and learning in nursing education in 2013–2017?"

Description of data extraction, synthesis and analysis

The literature search was conducted using the reference management software Refworks ProQuest to sort the records (Moher et al., 2009). The keywords for the search were: (((MH "Education, Nursing+")) OR ("nursing education")) AND (digital* or online AND ((best practice*) OR (good practice*)). After using the exclusion criteria (Table 3), the remaining articles were assessed and analysed using the qualitative content analysis. The process used to reduce and evaluate the records is illustrated in the Prisma diagram, Figure 10 (Moher, Liberati, Tetzlaff, & Altman, 2009).

Table 3. The inclusion and exclusion criteria of the literature review

Inclusion criteria	Exclusion criteria
Full text available	On other educational field as nursing
Research article	Not free of charge
English language	
On nursing education	On simulations, wound care etc.
Peer-reviewed	

The search using CINAHL Complete and manual search produced 52 articles. Ten of those studies were qualitative and two were quantitative. In addition, one of the studies dealt with a development of the education programme, and two with guidelines or instructions for the improvement of education. After the removal of duplicates (n=6) and records with invalid abstract content (n=14), 32 full text articles were the focus of further assessment. These were evaluated for their eligibility and content, and this led to the removal of 15 studies. Two studies were further excluded because the full text was not available free of charge. All studies were in English because the English language was used as one of the criteria for the search.
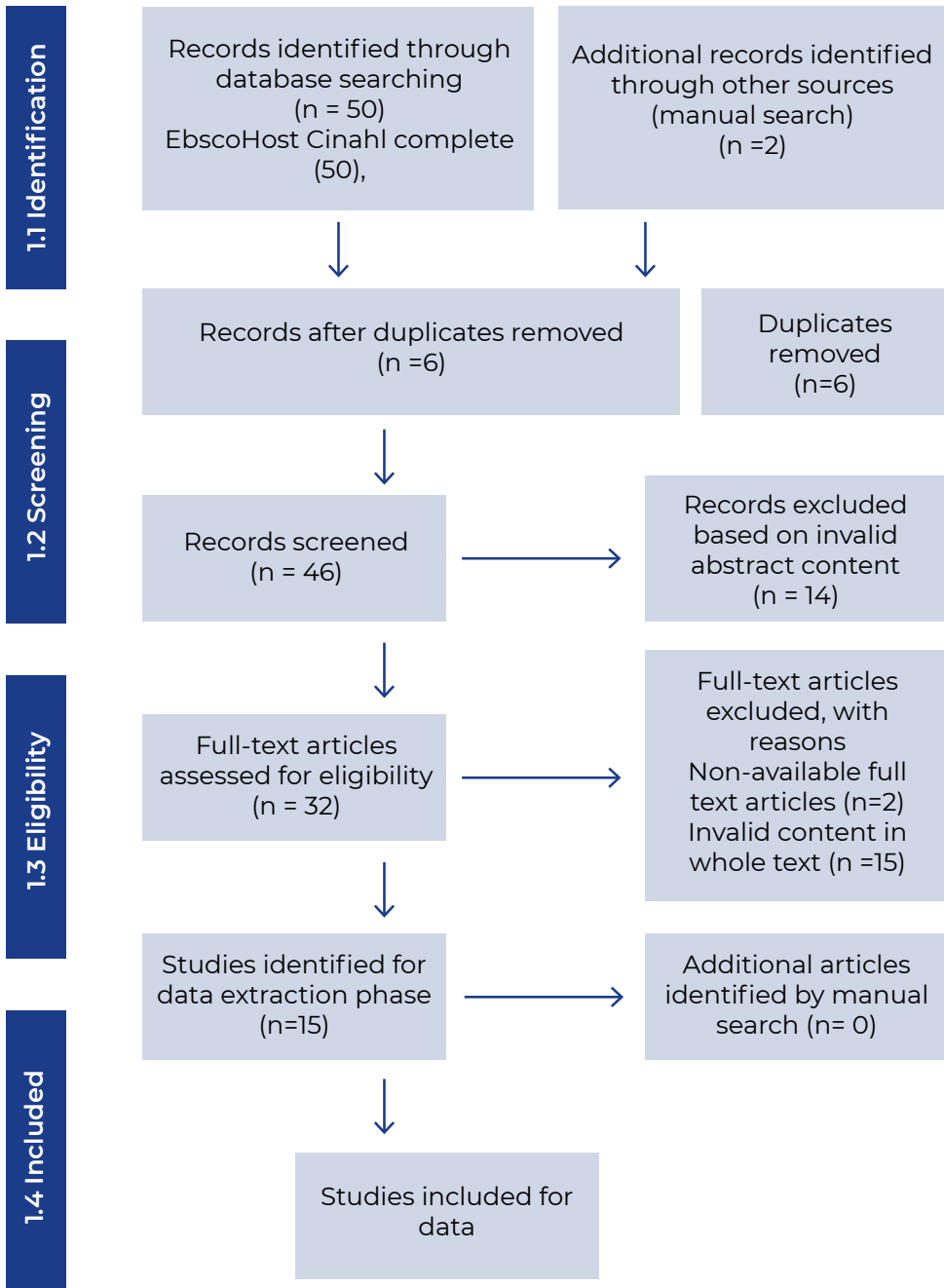
PRISMA 2009 Flow Diagram

Records identified through
database searching
(n = 50)
EbscoHost Cinahl complete
(50),

Additional records identified
through other sources
(manual search)
(n =2)

Records after duplicates removed
(n =6)

Duplicates
removed
(n=6)

Records screened
(n = 46)

Records excluded
based on invalid
abstract content
(n = 14)

Full-text articles
assessed for eligibility
(n = 32)

Full-text articles
excluded, with
reasons
Non-available full
text articles (n=2)
Invalid content in
whole text (n =15)

Studies identified for
data extraction phase
(n=15)

Additional articles
identified by manual
search (n= 0)

Studies included for
data

FIGURE 10: Prisma chart of the Best Practices in Teaching and Learning
Digital Nursing

An integrative review was applied to the literature data. Through interpretation and using qualitative analysis in the collected data, two main themes emerged: 1) interaction and communication between a facilitator/teacher and a student, 2) the importance of commitment to teaching and learning. These themes were intertwined with each other. The findings from this literature review were utilised in the development and design of the DigiNurse Model.

Interaction and Communication

The literature suggested that interaction and communication are the basic elements in teaching and learning. Plante and Asselin (2014) identified that social presence promotes sense of caring and belonging in online courses. According to Gazza and Hunker (2014), strategies that improve student retention in online graduate nursing education programmes are related to the interaction and communication between a facilitator (teacher) and a student. Students expect social presence from teachers and their attentiveness to their individual characteristics. Foronda and Lippincott (2014) as well as Gazza and Hunker agree that students appreciated online interaction, and the virtual classroom was described by students as being "more interactive and learner-centred than a traditional classroom." It produced enjoyment and was felt as being convenient (Foronda & Lippingcott, 2014). However, there were also contradictory views compared to Foronda's and Lippingcott's results on the social presence of teachers and their role. Smita and Pawan (2015) studied the relation between instructional design and overall meaningful interactions among online students. They found that the most important role of the instructor in an online class is to facilitate student participation and learning. A teacher works as a facilitator in online classes. Harasim (2012) also emphasises, according to Breen (2013), the facilitator role. Breen explored Harasim's model in her qualitative study. This online collaborative model (OCL) identifies a student's role as being independent when planning their learning event. According to Harasim's model, a teacher observes, helps students in problematic situations and confirms that learning outcomes are achieved. Breen (2013) stated that Harasim's theory is useful as a framework of teaching, but the development as a group cohesion should be evaluated independently along with the development of interpersonal skills. The development of group dynamics occurred only in small groups. In this, Frazer, Sullivan, Weatherspoon and Hussey (2017) agreed with Breen (2013). According to Frazer et al. (2017), effective online teachers facilitate, connect, lead and work in synchrony with students. The authors claim that these teachers' role characteristics enable students to

> **Students expect social presence from teachers and their attentiveness to their individual characteristics.**

gain success and advance in their studies and later encourage the utilisation of knowledge in their professional role. However, Smita and Pawan (2015) emphasise a balance of instructor involvement in online discussion: "not too much or too little." A proper balance of instructor participation in online discussion develops the quality of interaction (Smita & Pawan, 2015).

Wattenbarger, Mitchell and Scalf (2017) studied interaction and communication in two groups. One worked with faculty-driven interactive learning modules and the other independently with online material. Online material included a standardised pre-developed course cartridge created via a publishing vendor. Wattenbarger et al. (2017) evaluated and compared student satisfaction and achievement with their course learning outcomes. The results showed that students who were grasping at the content of the pre-developed cartridge material were not as active in the online learning environment and did not feel a personal connection with their instructor. However, the cartridge material group later gained better learning outcomes than those students who had participated in interactive learning modules.

McNeill, Dunemn, Einhellig and Clukey (2017) concentrated on exploring professional behaviour focusing on interaction and communication. They claimed that instructors' professional behaviour is essential when delivering courses and orienting students for workplaces. Moreover, the students expected professional behaviour from an instructor and preceptor in online courses. As nursing students' clinical training periods form a large part of their studies, the teachers' way of interacting and communicating with students is extremely important. The students had also experienced

or identified uncivil behaviour, such as rude comments. In the students' opinion, lack of timely feedback on assignments and unclear tasks were examples of uncivil behaviour (McNeill et al. 2017). They also suggest closer exploration of small-group, breakout discussion groups for improving the quality of interaction. These methods can ease lacking feedback situations and provide an option for the airing of thoughts. An interesting observation was that randomisation promoted interaction in student groups on account of the students not being in their known cohorts.

Interaction and communication in clinical environments make up a large part of students' education. Tolonen and Värri conducted a survey in 2017 investigating how information technology was taught to students of the healthcare professions in Finland. Their results showed that digital technology is available at nursing schools, but it is expected that students learn to use information and communication systems during their training periods or later after graduation. However, information communication technology (ICT) education varied a lot between schools, and healthcare professionals had had only a little additional ICT training at work. The lack of further training had an undesirable impact on nurses' attitudes towards the use of digital tools. However, several other studies have shown that nurses are willing to have e-learning courses and employ mobile learning at point of care if time and learning resources are organised (Lahti, 2014; Gazza, 2017; Mather & Cummings, 2017; Tolonen & Värri, 2017). There are many tools available for communicating online, such as virtual platforms that allow flexible, time-free work (Slade, Wolf, Spadaro, & Gazza, 2013). Support and encouragement of managers and organisations are of great importance to nurse supervisors' as well as teachers' commitment to digital teaching and learning (Mather & Cummings, 2017).

The importance of commitment

Teaching and learning require commitment from all participants in the teaching situation (Price et al., 2016). This fact concerns all stakeholders and organisational levels, including managers, students, teachers and preceptors. Mann, Medves & Vandenkerkhof (2015) have stated that nursing faculties may need guidance for effective introduction of mobile technology. The authors address that mobile technology may promote evidence-based practice and also optimise the use of acquired technological skills in clinical settings. However, Mann et al. (2015) likewise emphasise that attention should be paid to students' attitudes.

Mather and Cummings (2017) investigated the findings of a previous study to elucidate among other things the priorities for action and focus of impetus for advocating the progression of standards and guidelines at an organisational level. The organisational commitment produces the best clinical outcomes for patients and therefore prioritises mobile learning as a component of digital professionalism within the healthcare organisation (Gazza, 2017; Mather & Cummings, 2017).. Furthermore, student commitment can be promoted by teaching the use of technology. However, insufficient skills in using the devices and a lack of support from clinical staff in clinical settings have been identified among students (Mann et al., 2015). This is an important gap to recognise, because attitudes towards technology may lead to an unwillingness to use mobile technology after graduation.

Discussion and conclusion

This literature review on the best practices in online teaching and learning provides some important views for reflection. One cannot underestimate the influence of interaction and communication in online or traditional teaching classes. The literature shows that the same elements can be found in both, confirming for example the importance of social presence and the feeling of belonging between participants. Therefore, attention should be paid to the ways of communication, because this can have a long-lasting impact on student behaviour after graduation (McNeill et al., 2017). Interaction between participants develops better in small groups (e.g., Smita & Pawan, 2015), and there are various digital tools for virtual small group work available. According to some of the reviewed studies (Foronda & Lippincott, 2014; Gazza & Hunker, 2014) there is a positive impact of social presence and good interaction in online teaching on learning outcomes. However, this finding seems to be contradictory, because some older studies along with recent ones do not support this. In one pioneering study, Mahoney (2006) examined similarities and differences of sense of belonging, comparing students' feelings in online and face-to-face courses. The results showed that students could gain a sense of belonging regardless of the way or method of teaching. Statistically significant differences were not found between the two groups. Therefore, Mahoney (2006) concluded that establishing an environment where one feels connected is more important than the type of structural environment. In recent literature, Männistö et al. (2019) evaluated the effects of a digital educational intervention on collaborative learning in nursing education in two groups. The intervention group studied using a collaborative

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digital learning environment and the control group studied in the traditional classroom setting. There were no significant differences between the groups in terms of student satisfaction. However, the students' satisfaction in the intervention group decreased later, but they had higher satisfaction in the area of promoting collaborative group work and they also received significant higher grades in the final course evaluation.

The participants' commitment to teaching and learning is essential in both online and traditional classrooms. This creates positive learning outcomes and is one of the prerequisites of successful learning (Frazer et al., 2017). Commitment is also desired for lifelong learning, which has become more important due to the rapid advancement of digitalisation in healthcare and around the globe. Commitment from educational and healthcare organisations and representatives of working life is also needed, because only collaboration can advance the achievements of the objectives of learning. Coping with the challenges of digitalisation in healthcare staff cannot be a matter of reactive, daily survival (Tolonen & Värri, 2017). Moreover, overwhelming online material can be a hazard to learners, and students are concerned about the quality of the material they read (Elf, Ossiannilsson, Neljesjö, & Jansson, 2015). Therefore, education on digital literacy is needed, too (Stauffer, 2020).

This explorative review of the research articles on the best teaching and learning online practices was focused on literature published in 2013-2017. The current situation with the COVID-19 pandemic has accelerated online teaching and digital learning environment development. The rapid transition of teachers and students to online work has shown that those in working life also have a great opportunity to increase the use of the web in their learning. New digital tools, such as virtual platforms, have been rapidly adopted to learning environments (Mather et al., 2020). Online teaching is here to stay, and the development of the best online teaching and learning practices continues.

Recommendations for online teaching and learning based on the explorative literature inquiry (More information on DigiNurse project website: https://projects.tuni.fi/diginurse).

- Small groups, randomisation of students for groups
- Provision of social presence and attention to students' individual characteristics if possible
- Support of students' acquisition of related skills and learning devices
- Continuous education on online related skills
- Collaboration with partners and stockholders involved with the education
- Provision of online courses to preceptors of the clinical environment
- Provision of quality online courses
- Support of student interaction with each other during teaching sessions
- Consideration of the participants' role in teaching and learning sessions
- Organisational and faculty support: guidelines and resources for teaching and learning

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4 Philosophical and Practical Basis of the DigiNurse Model

The philosophical themes forming the basis of the DigiNurse Model comprise ethical aspects, evidence-based knowledge, salutogenesis, positive health and the chronic care model. The practical basis of the DigiNurse Model, which nursing students are expected to manage, includes the transversal skills of the 21st century. These themes and the practical basis are introduced in this chapter.

In addition, the data security is a fundamental value in the model. The topics of data security and care are discussed in Chapter 5.8 in the context of the technology aspects of the DigiNurse Model.

4.1 Ethical Considerations and Evidence-Based practice

Nina Smolander, Annukka Isokoski and Raija Kokko

Ethical considerations are entwined in every aspect of life. Particularly in nursing, the ethical aspects are fundamental core values assumed from healthcare professionals and expected by patients and their significant others. The understanding and internalisation of ethical principles constitutes the basis of every nursing decision and action. (Kangasniemi, Pakkanen, & Korhonen, 2015.) Therefore, the ethical considerations are discussed throughout the DigiNurse Model and referred to in various contexts in this publication.

The core ethical components comprising the foundation of quality care are phrased in the international Nurse's Ethical Code of Conduct (International Council of Nurses, 2012) and educated during the nursing studies. Acting on the best interest of the patients and causing no harm to patients are basic ethical principles. Respecting the autonomy of patients and following the codes of confidentiality, privacy and equality likewise comprise the basis of ethical competency taught during the healthcare

> The understanding and internalisation of ethical principles constitutes the basis of every nursing decision and action.

education. (Stogiannos, 2019.) Healthcare professionals must follow professional values such as integrity, compassion, trustworthiness and responsiveness (International Council of Nurses, 2012). In counseling or coaching relationships, the ethical aspects are further emphasised with regards to the patient's rights to informed, autonomous decision-making and a delivery of accurate and objective information in a balanced and comprehensive way. The veracity is a fundamental requirement to strengthen the relationship between healthcare professionals and patients and expected to be delivered with cultural competency. (Mitchell, 2017.) In addition, the healthcare professionals must recognise their own personal ethical values and potential issues influencing their professional behaviour and co-operation with patients and their significant others (Kangasniemi, Pakkanen, & Korhonen, 2015).

Some ethical considerations, such as respect, confidentiality and collaborative decision-making (More information in Chapter 5.4), get emphasised specifically while caring for patients with chronic conditions. In long-lasting nurse-patient relationships the aspects of ethical issues occur in a bi-directional way and mutual respect should always be present. The healthcare professional's respect for the patient's expertise about their condition and the patient's respect for the healthcare professional's expertise forms a companionship, which results in quality care based on patient-centred, ethically solid decisions (International Council of Nurses, 2012). The Nurse's Ethical Code of Conduct constitutes the foundation of ethically considerate care.

The ethical conduct of care has traditionally applied to nursing in face-to-face encounters. The development and shift of nursing to digital envi-

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ronments has created various options, innovations and responsibilities for the healthcare professionals, affecting the ethics in nursing (More information in Chapter 5.8). The same requirements of technology and ethics concern healthcare students who also require more education related to technological advancements. Regardless of the current state of digital care in practical nursing environments, in nursing education adaptations of curricula are necessary to achieve the skills required from the future professionals. (Meetoo, Rylance, & Abuhaimid, 2018.) Nurses are expected to stay updated on the opportunities to provide digitally performed patient education and support. The availability of various digital tools will increase patients' opportunities to acquire health-related information and stay informed by utilising the digital materials according to their needs. (Heiskell, 2010.) Furthermore, people are increasingly used to digital communication methods and tools and assume opportunities to receive care and counselling through digital channels. The developments in the field of digitalisation and technology may present various ethical issues related to boundary settings, communication structures and information delivery regulations. (Wilcoxon, 2015; Regulation 2016/679/EU). Digitally stored and collected health-related information will potentially create significant ethical challenges but also increase safety via information accessibility and traceability. The reliability of the tools and storage units will be topical in future discussions and require careful regulations. (Meetoo, Rylance, & Abuhaimid, 2018.) On the other hand, digital tools and applications may generate an environment where safe care can be provided even during exceptional circumstances, e.g. pandemics (Martin, 2020).

National and international guidelines and regulations on ethical digital services and data protection provide the framework for ethical considerations in digital healthcare. According to the European Comission Ethics guidelines for trustworthy Artificial Intelligence (AI) (2019), the trustworthy AI should not only be lawful and robust but apply ethical principles of respect for human autonomy, prevention of harm, fairness and explicability. According to the WHO's guidelines on digital interventions for health system strengthening (2019), there are many opportunities to improve the efficiency of healthcare services and health promotion by digital interventions. Nevertheless, it is acknowledged that the digitalisation alone is not enough to face the challenges of health systems and achieve universal health coverage, but it does bring a valuable component to the development work (WHO, 2019).

Ethics in nursing education must follow the evolvement and changes of societies. The Code of Ethics for Nurses, which was initially launched in

1953 and last updated in 2012, is under revision to meet the requirements and challenges of a revolving and interconnected world. The better the global understanding of the Code by nurses in every nursing field, the more profound the nurses' ethical competency will be. While the core content of ethical principles needs further strengthening, the added ethical content related to AI, technology and various digital communication methods needs to be integrated firmly to the Code of Ethics for Nurses. (Stievano & Tschudin, 2019.) The refined and adjusted methods of healthcare education will support this goal. The teaching of ethical considerations e.g. in study groups is suggested to be more effective than lecture-based education. Students' abilities to comprehend the patient's safety, autonomy and confidentiality, in particular, will be improved as training is organised in teams. (Kareff, McNulty, Goodman, & Agarwal, 2019.) Moreover, further training of ethical competency for healthcare professionals has been suggested. The ability to recognise and define the ethical needs and dilemmas is rising in importance. As nurses are acting as an advocate for the patient, their enhanced ethical awareness and readiness to influence ethical decision-making can improve wholistic care. The opportunity for advanced ethical education will increase nurses' professional growth and improve ethical quality care. (Neumann, Counts, & Jernigan, 2019.)

These requirements of a refined Code of Ethics for Nurses and educational adjustments in nursing education have been integrated into the DigiNurse Model (More information in Chapter 5.2). Human dignity and collaborative decision-making in connection to technology are intertwined in every element of the model. Therefore, the ethical aspects are mentioned in many chapters of this e-book.

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Evidence-based nursing

Raija Kokko

Some researchers have stated that history of evidence -based nursing started in the 1800s when Nightingale (Florence Nightingale 1820–1910) worked in military hospitals in Turkey (Nightingale 1970; Selanders 2012). She observed patients' care and noticed that many deficiencies in care were due to poor hygiene practices. Furthermore, she used evidence obtained through investigation and even statistics to improve patients' outcomes of care (Nightingale,1970). The concept of evidence based was not used during Nightingale's time, it only came into use in the 1970s. However, Nightingale is said to be the pioneer of evidence-based nursing practice (EBP) (Mackay & Bassendovski, 2017).

In this chapter is described the first steps of evidence-based practice in health care from the development of the concept to evidence-based practice of today. Also, nursing education is viewed because its responsibil-

ity is to produce future nurses equipped with the ability to perform evidence-based nursing (EBN) (Selanders & Crane, 2012).

In the 1970s evidence-based practice was called evidence-based medicine. A physician Cochrane (Cochrane Collection, 2013) used randomized trials to receive the most reliable results in his medical studies. Later Sackett et al. (2004) added high level of critical thinking to the concept of evidence-based medicine and in addition, he emphasized the exploitation of patients' values in order to obtain valid research evidence. According to Sackett et al. (1996), a diagnosis should include evidence, research and individual patient's values, beliefs and will. Furthermore, Sackett et al. 1996 claimed that evidence-based practice is "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patient". However, over time the concept evidence-based medicine changed again, and in early 1990s, healthcare professionals started using the concept of evidence-based practice (Sackett et al., 2004). This concept was adopted to other professions, for instance to healthcare, and to nursing it came in the late 1990s. The development of the concept continues but they stem from Sackett's definition. (Yates, 2013.)

Nowadays, evidence-based practice (EBP) has become a fundamental basis of professional nursing (Weaver, Warren & Delaney, 2005). There are several definitions, for instance, Scott & McSherry (2009) claim that EBP provides nurses with a method of using critically appraised and scientifically proven evidence when taking care of their patients. Stievano & Tsudin (2012) have stated that evidence-based practice is a way for the

> Nowadays, evidence-based practice (EBP) has become a fundamental basis of professional nursing (Weaver, Warren & Delaney, 2005

nursing discipline to minimize the theory to practice gap. Furthermore, they defined that "evidence-based practice in nursing is "a problem-solving approach to clinical decision making that incorporates a search for the best and latest evidence, clinical expertise and assessment, and patient preference values within a context of caring" (Stievano & Tsudin, 2012).

According to Melnyk et al. (2012) EBP is a problem-solving approach to clinical decision-making in healthcare. It integrates "the best evidence from well-designed studies with the clinicians' expertise, including internal evidence from patient assessments and practice data, and patients' preferences and values". According to Melnyk et al. (2012) using EBN results in high-quality care, and in addition, it improves patient outcomes, and reduces healthcare costs. Sometimes concepts of EBN and EBP are used as parallel concepts. However, it is claimed that EBN is using EBP as a foundation. According to Scott and McSherry (2009), the concept of EBN should be defined as an independent concept.

There are three traditional components of EBP (Figure11). Best scientific evidence means that nurses use current research literature results in their decision making. Some researchers claim that the best evidence is found in systematic reviews and meta-analyses (Sackett et al., 2012). The nurse must take into account the patient's preferences and values in their decision making. The nurse uses her knowledge and skills for the best interests of the patient and ensures that they are updated (International Council of Nurses, 2012; Melnyk et al., 2012). Clinical expertise includes skills acquired during basic nursing education and clinical skills developed at work. In addition, so-called tacit knowledge is often connected to health professions. Tacit knowledge develops through work experience and for instance nurses utilize this experience in their decision-making. (Kothari et al., 2012.) Terms like skills, intuition, know-how, procedural knowledge, implicit knowledge, unarticulated knowledge, and practical or experiential knowledge have all been used to describe tacit knowledge (Ambrosini & Bowman, 2001). However, Nightingale has stated more than one hundred years ago that nurse can work up to fifty years without ever getting wiser (Nightingale, 1970). Therefore, it is often argued that the concept of tacit knowledge is contradictory (Yates, 2013).
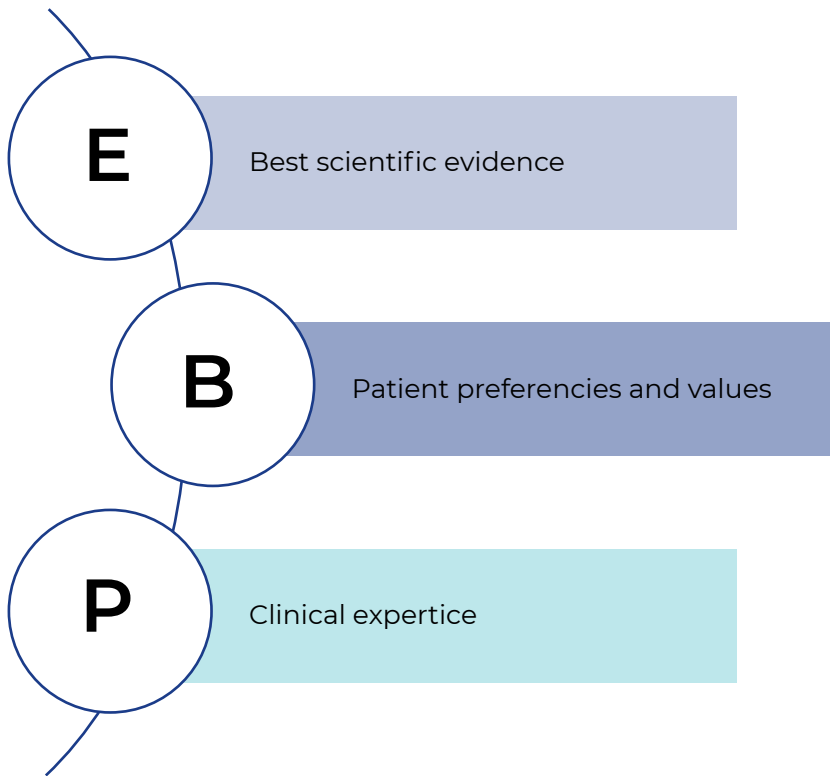
FIGURE 11. Evidence-based practice (EBP) (Sackett, 1996; Melnyk et al., 2012, modified)

EBP is largely used as a foundational element in teaching in nursing education. Education aims at students' learning EBP skills which they can apply to practice during their clinical training periods. May-Elin et al. (2018) studied teaching strategies for EBP knowledge and skills currently used in undergraduate nursing education. Their literature review results (consisting of 7 studies), showed that teaching strategies to enhance EBP knowledge and skills are recommended. However, recent research indicates that nurses may not be well prepared to apply EBP. May-Elin et al. (2018) identified four teaching strategy themes which were interactive teaching strategies, interactive and clinical integrated teaching strategies, learning outcomes, and barriers. The barriers included challenging collaboration at work, limited awareness of EBP principles and poor information literacy skills. Doran et al. (2010) claims, based on their study results, that barriers to conduct evidence-based practice are the same with nursing students and clinical nurses.

Lack of current research knowledge and wireless access cause problems in many places. Utilization of technological development is crucial in today's health care institutions and clinical settings to implement high-quality care for patients (Yates, 2014). Mthiyane and Habedi (2018) examined nursing educators in implementing EBP in teaching and learning. In addition, the purpose was to describe the importance and benefits of EBP in teaching and learning in the nursing profession, especially for nurse educators and student nurses. Findings revealed that, although most of the nurse educators are supportive and displayed a positive attitude towards implementing EBP in teaching and learning, the level of knowledge and skills was questionable. This was coupled with a lack of motivation and commitment towards research. The authors suggest that nurse educators should be supported through in-service training, workshops and affiliation to journal clubs to improve their knowledge and skills regarding EBP competencies. Also, relevant adequate resources should be made available and accessible to nurse educators and nursing students (Mithiyane & Habedi, 2018).

Conclusion

Nurse educators should be supported through in-service training, workshops and affiliation to journal clubs to improve their knowledge and skills regarding EBP competencies (Mithiyane & Habedi, 2018). The exploration of the concept of evidence- based practice showed that it is used in nursing education. However, implementation of EBP needs enhancement because nurses in clinical practice would like to have more time, support and knowledge for its application (Shifaza, Evans & Bradley, 2014; May-Elin et al., 2018). Collaboration between nursing and healthcare institutions could be more intensive. Also, exploitation of digital opportunities in communication could open new chances in classrooms and clinal practice to further develop evidence-based practice (Weaver et.al. 2005; Doran et al. 2010). The authors claim that information technology (IT) is presented as the underlying tool that makes this rapid translation of nursing knowledge into practice and education feasible.

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4.2 Salutogenesis and Positive Health
Hilde Vandenhoudt, Pirjo Vesa and Dorine Nevelsteen

Health has become the highest good to strive for. The wellness industry is booming. Everyone is in one way or another permeated by the importance of a healthy lifestyle. And yet, we have never had as many people suffering from a chronic disease in history as now. Chances are high that one will develop cancer, diabetes, a cardiovascular problem, chronic pain, a musculoskeletal disorder, a mental or psychiatric problem, or any combination of these during one's lifetime. As life expectancy continues to increase, so too does the number of years living with a chronic disease, in less than excellent health. Not only does this put an enormous strain on the current healthcare system, it also has an impact on the quality of life.

In addition to positive events and quality time, life also includes suffering, adversity, misfortune and hardship. People need to develop coping strategies to deal with these negative setbacks. The key to a fulfilling life then is to figure out how to accept difficulties as a part of life, how to cope with challenges and how to make use of internal and external resources to overcome difficulties. It is a matter of resilience, which in a broad sense refers to accepting the unfortunate adversity of life and moving on. Even traumatic events are part of life and can cause pain and sorrow. Resilience does not remove pain or sorrow, but it does provide the ability to face difficulties and overcome them.

Salutogenesis

Our current healthcare system focuses more on disease management than on health management. Traditionally, researchers have been investigating the origin of disease (pathogenesis) in order to develop a cure or a way of care. Although strategies for the prevention of disease and health promotion are gaining support, the majority of healthcare professionals continue to be involved in the cure and care of patients, rather than supporting the health of citizens or helping people to heal.

Antonovsky (1983) proposed a different view on health based on his research of women who endured famine, torture and severe stress and anxiety during World War II being locked up in concentration camps. Despite these very traumatic events, some women remained in good health, while others did not. Antonovsky became interested in the factors

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that can protect health from adverse effects and directed his research to the origin of health or 'salutogenesis' and the relation between health and well-being, stress and coping. (Lindström & Eriksson, 2005.)

Central to Antonovsky's research is the concept of 'sense of coherence' (SOC), i.e. the cohesion of all things and the feeling of trust that everything is going to be all right. It brings a more holistic view on health on board where body and mind are connected. People with SOC survive and endure heavy experiences relatively well. SOC is constructed along three axes. The sense of comprehensibility refers to the ability of a person to make sense of it all, to get an overview of their life, and to having a good insight into the disease one is suffering from. The sense of manageability refers to the coping strategies of a person to get a grip on their life, having confidence in the influence that one can have on their situation, the possibility to find resources to help gain control, and the skills that one can learn to manage better. A third axis is the sense of meaningfulness. It refers to a sense of purpose, the motivation of a person to come up with realistic goals.

A person's SOC develops in early childhood (before the age of ten) and remains relatively stable throughout life. A sense of coherence does not protect against difficulties but reflects the confidence to overcome difficulties. It helps people deal with uncertainty and stress. It reflects a person's ability to adapt.

How a person perceives their health is associated with the SOC. Antonovsky considers disease and health as two opposite poles on a continuum. A person moves throughout their life along this continuum towards health or disease. It is a dynamic process, influenced by the environment or context of the person, and by their traits. There are stressors that make one move towards disease, and there are health-promoting factors that help one move towards health. One can make use of general resistance resources. These can be internal (based on the traits of a person, their resilience) or external (for example the social network a person has) resources. The SOC has been measured with a validated instrument in several countries. Research found a correlation between SOC and psychological aspects of health. The results are less clear on the correlation with physical health. (Antonovsky 1987, Eriksson & Lindström, 2007.)

Positive health

To this day we are still using the definition of health that was proposed by the WHO in 1946. "Health is a state of complete physical, mental and social

> A sense of coherence does not protect against difficulties but reflects the confidence to overcome difficulties.

well-being and not merely the absence of disease or infirmity." (WHO, 1946.) More than 70 years later, the world has changed beyond recognition. The way health is defined sets the bar very high and makes it almost impossible to reach. It is the word 'complete' in the definition that is troublesome. Who can honestly claim a state of complete physical, mental and social well-being? Indirectly, this definition puts the majority of people in the 'non-healthy' group. On the other hand, even when suffering from a chronic disease you can still feel healthy. High time for a new vision on health you would think, no? Huber et al from the Institute for Positive Health proposed a new concept in 2011 which is gaining momentum, 'positive health' (Huber et al., 2011). They describe health as the ability to adapt and self-manage in the face of social, physical and emotional challenges of life. If we critically look at this concept, we note that health is portrayed as a dynamic process that requires resilience and flexibility to adapt to the changes that happen throughout life. If one is able to self-manage their life, one can enjoy positive health even when suffering from illness. It opens many more possibilities to approach health in a holistic way and live a fulfilling life. The concept of positive health is built upon the research of Antonovsky, and connects with the SOC (Eriksson & Lindström, 2007).

Through her research, Huber identified six basic domains of life which she named the pillars of positive health. These include daily functioning, bodily functions, mental well-being, meaningfulness, social-societal participation and quality of life. The focus is on the person, not on the disease. Based on the domains of life, an instrument has been developed to assess a person's perception of their own health: the positive health spiderweb. We recommend using this dialogue tool to start the coaching process of persons

with a chronic condition. How to use the spiderweb is explained in Figure 12 (Page 82).

Positive health encompasses three elements:

- How does a person perceives their health? (spiderweb tool)
- What is really important to the person, what would they like to change? (the other conversation or, in the DigiNurse Model, the coaching process)
- What are the first steps to get a grip on the situation? (the action plan)

The DigiNurse Model applies the concepts of salutogenesis and positive health and reinforces the values and abilities of the person being coached by supporting their self-management.

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Assignment to get acquainted with the six domains of life

- Download the positive health spiderweb: https://www.iph.nl/meedoen/gratis-downloaden/
- How do you perceive your health at this moment?
- Give yourself a score from 1-10 for each of the six domains and connect the scores on the spiderweb.
- Questions to yourself about your spiderweb:
- What are you very pleased with?
- What is important to you?
- What would you like to change?

Positive Health is a concept that takes on a broader view of health and considers physical, social and psychological well-being as a dynamic process on a continuum rather than the presence or absence of disease. It also focuses on 'health' and resilience instead of 'disease' and limitations. The Institute for Positive Health in the Netherlands developed a tool that helps a person gain insight into what is important regarding their health so that they can discuss this with a health professional.

The Positive Health tool is a simple conversation tool (Figure 12). This tool is preferably completed together with a health professional in a safe and familiar setting. First, complete the tool together to get a picture of how the person perceives their health. As a health professional, you will gain a unique insight into how the person looks at their situation at that moment.
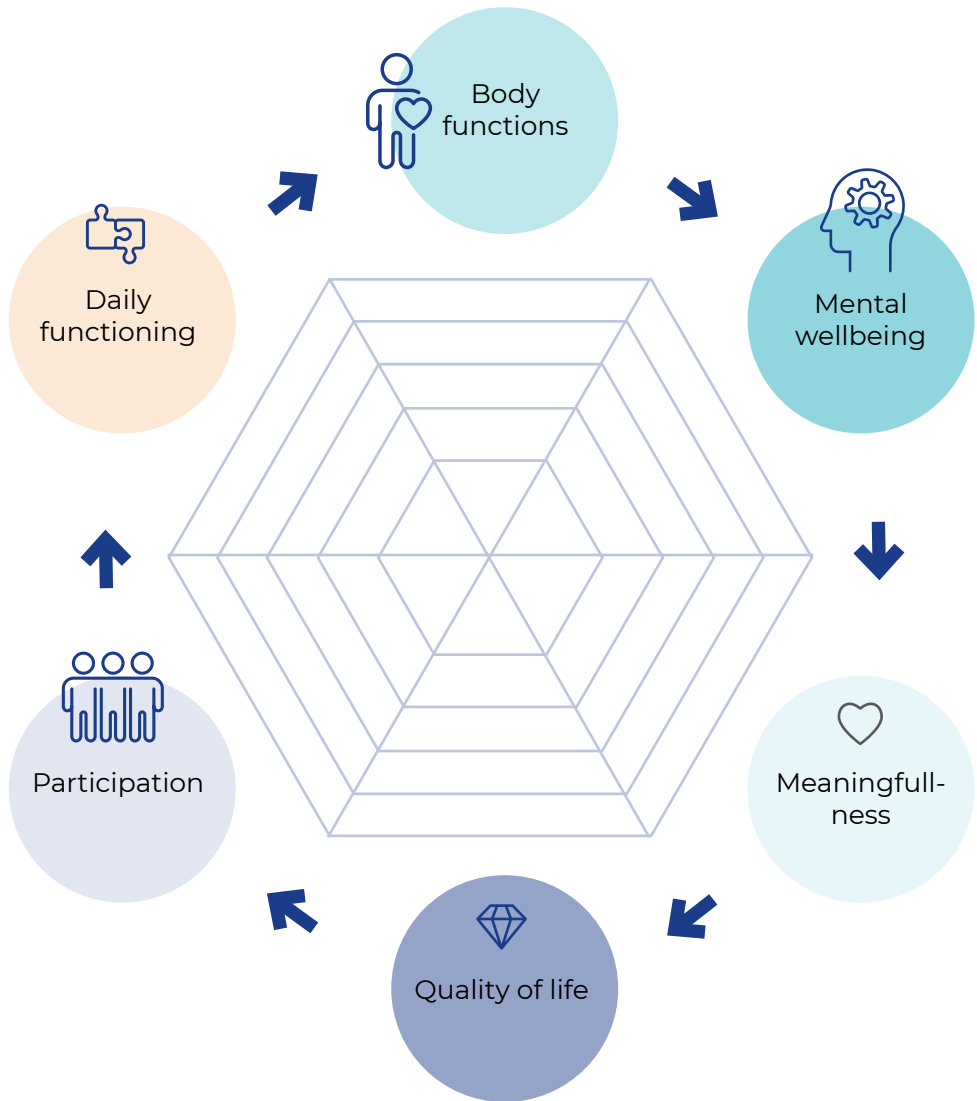
• feeling healthy • feeling fit • complaints and / or pain • sleeping pattern • eating pattern • physical condition • excercise	• memory • concentration • ability to communicate • being cheerful • accepting oneself • ability to handle changes • having control	• having meaningful life • being high spirited • confidence • acceptance of life • gratefulness • continue learning
• enjoyment • happiness • feeling good • feeling well balanced • feeling safe • living conditions • having enough money	• social contacts • being taken seriously • doing fun things together • support of others • belonging • doing meaningful things • being interested in society	• looking after oneself • knowing own limitations • knowledge of health • time-management • managing money • ability to work • asking for help

FIGURE 12. My Positive Health Dialogue tool 1.0 (Institute for Positive Health, 2019, modified)

Based on the created picture (a spiderweb on six axes), you continue the conversation with the person. What is important to them? Does the person want to change something? In which domain? Next you will explore together which resources are available to provide support. Are there e.g. professionals or informal caregivers who can assist (Institute for Positive Health, 2019)?

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4.3 Chronic Care Model

Marija Milavec Kapun, Tina Gogova and Hilde Vandenhoudt

Professional support to a patient with a chronic illness is a key element in improving the quality of life of the patient and that of their loved ones. Successful professional support can result in lower treatment costs and positive treatment outcomes. Professional care for these patients is most of the time provided at the primary level of healthcare, especially at the patients' home environment. Different models of care of patients with chronic diseases have been developed. The Chronic Care Model (CCM) is one of the most researched and studied in recent years (Grover & Joshi, 2014).

The CCM was developed in 1998 by a group of researchers from the MacColl Institute for Healthcare Innovation in the USA. Wagner and his co-workers designed a model that, while the number of patients with chronic diseases is increasing, should ensure that these patients receive quality care at the right time, at the right place and by the right professional. Wagner with his team identified a gap in chronic disease management at the primary level of healthcare. Patients did not receive enough support to deal with chronic diseases due to the focus on acute care (Wagner, 1997). The CCM puts much emphasis on the active role of the informed patient with whom interdisciplinary teams are in productive communication (Bodenheimer, Wagner & Grumbach, 2002).

Description of the Chronic Care Model

The cornerstones of the CCM (Figure 13) are the community where the patient receives the care and the healthcare system providing the care (Wagner, 1997). CCM includes six key components illustrated below (Adams & Grieder, 2014; Improving Chronic Illness Care, n.d.).
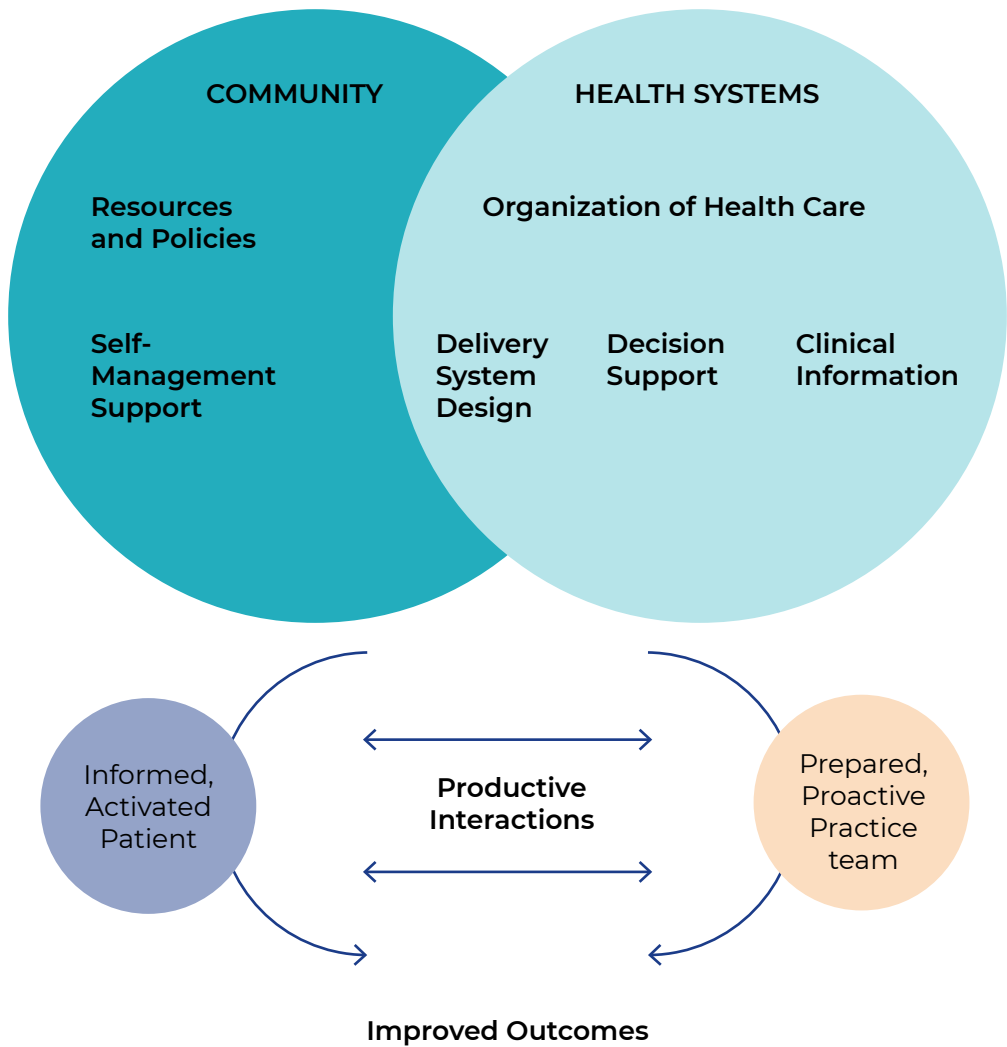
FIGURE 13. Chronic Care Model (Wagner, 1998, modified)

The first key component of the CCM is an Organisation of Healthcare. A health system with a unique culture, organisation and mechanisms promotes safe and quality care of patients with chronic disease. All stake-holders at all levels, including management, will support the care and promote effective strategies for improving and redesigning the system.

They will promote transparent and systematic management of adverse events or errors, provide quality-based incentives and facilitate better communication and coordination between organisations. (Adams & Grieder, 2014.)

The second key component of the CCM is a Delivery System Design. The effective and efficient delivery system design includes the definition of team members' roles and tasks, planned interactions to deliver evidence-based care and utilising the case manager services for the patients with complex needs. In addition, the care is tailored according to patients' health literacy level, and cultural and linguistic backgrounds. (Adams & Grieder, 2014.)

The third key component of the CCM is a Decision Support System. This system is based on evidence-based guidance in day-to-day clinical practice. The guidelines are shared with patients to encourage their involvement using proven health education approaches and while engaging different professionals in primary care. The next, fourth key component is a Clinical Information System. It provides effective and efficient care, includes reminders for carers and patients, identifies active care teams, supports individual patient care planning, ensures patient and provider information sharing, and monitors team performance and the entire supply system. (Adams & Grieder, 2014.)

The fifth key component is Patient Self-Management Support. This is enabled by empowerment and preparation, emphasising the patient's central role in managing their own health and well-being (including emphasising the responsibility of the patient). Implementing successful self-care support strategies (e.g. assessment, goal setting, action planning, problem solving and monitoring), and identifying and organising resources for the community and patient provide ongoing support for self-management. Through these activities, patients are provided with relevant information and emotional support, and they can formulate their own strategies for living with the chronic disease. (Adams & Grieder, 2014.) Community resources and policies is the last key component of the CCM. Patients are encouraged to participate in effective community programmes, which establishes collaboration with local organisations. This supports the operation and development of interventions addressing missing services and advocating local and state policies to support improved patient care. This approach ensures quality and progress in the provision of appropriate services. (Adams & Grieder, 2014.)

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CCM has proven to be extremely useful and successful in caring for patients with diabetes, asthma, heart failure and depression. It has also been applied to improve wound care and treatment in the home setting (Improving Chronic Illness Care, n.d.; Piatt et al., 2006; Stellefson, Dipnarine & Stopka, 2013; Wagner, 1998; Wagner et al., 2001). Integrating the components of the CCM into transforming approaches to patient care has a positive impact on healthcare outcomes and quality of care. In addition, it lowers the treatment costs of patients with chronic diseases (Coleman, Austin, Brach & Wagner, 2009).

The CCM modifications, called the Innovative Care for Chronic Conditions Framework (WHO, 2002) and the Expanded Chronic Care Model (Barr et al., 2003), take into account broader health determinants. These models focus on a system of concerted action within different types, levels and locations of care, extending professional measures beyond the provision of direct care services, including health promotion and prevention activities, screening, early detection and treatment of diseases, rehabilitation and palliative care (WHO, 2002, 2016).

The model is widely used in improvements and in new approaches to healthcare delivery for patients with chronic diseases, which also includes digital technologies in patient care technology (Barceló et al., 2013; Glasgow, Huebschmann, Krist & Degruy, 2019).

The eHealth Enhanced Chronic Care Model

The upgraded eHealth Enhanced Chronic Care Model (eCCM) (Figure 14) provides insights into the role of digital technologies in supporting the self-management of the patient with chronic diseases (Gee, Greenwood, Paterniti, Ward & Miller, 2015).

Community – Health System – eCommunity - eHealth

Delivery System Design
(care coordination, interoperability, medical jargon, timeliness, policy, content, networking, design)

Clinical Decision Support
(graphs, charts, protocols, guidelines, reminders, infobuttons etc.)

Clinical Information System
(patient portal, Internet, mHealth, smart phone, wearable devices, telehealth etc.)

Self-management support
(24/7 access, convenience, communication, reminders, alerts, planning, empowerment, engagement)

DATA INFORMATION KNOWLEDGE WISDOM

eHealth Education
(message training, health education, technology training, eCommunity training, navigation training, volume of information

Informed, Activated Patient

Complete Feedback Loop

Productive Interactions

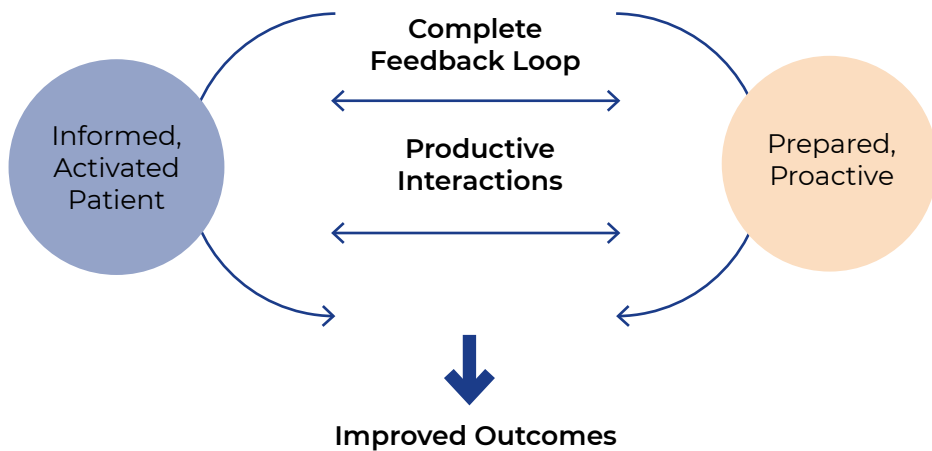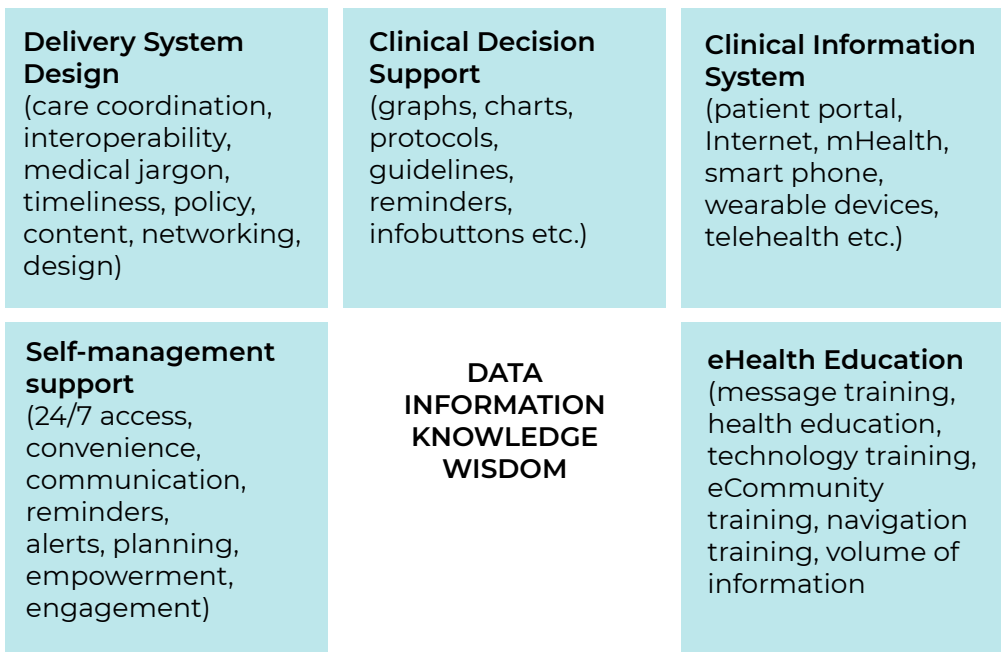Prepared, Proactive

Improved Outcomes

FIGURE 14. eHealth Enhanced Chronic Care Model (eCCM) (Gee et al., 2015, modified)

The eCCM relates well to the DigiNurse Model. It explains how the integration of eHealth can become an important contributor to the quality of life for patients with a chronic condition. In this model, eHealth enhances the empowerment and self-management of the patient. It stimulates inter-professional collaboration and uniform evidence-based treatment tailored to the data of the patient, and provides the tools to guarantee continuity of care throughout the different phases of life and disease. The patient is well-informed and an active participant in their own care process. Their team of healthcare providers are aware of their condition, goals and care plan. (Gee et al., 2015.)

This approach results in improved health outcomes, e.g. better quality of care as well as reduced co-morbidity, multimorbidity, mortality and health-care costs (e.g. less hospitalisations) (Hibbard & Greene, 2013). This model reflects a healthcare system where the patient receives all the support while staying well-informed, remaining at the centre of their care and making decisions about their own health. The patient's team of formal and informal healthcare workers work together with them to help them achieve their goals. (Gee et al., 2015.)

The digitalisation of processes and information sharing enhances the collaboration and communication between the patient and their care team. In this way, the quadruple aim of healthcare can be achieved: better quality of life, better health outcomes, at better cost and with a higher work satisfaction of healthcare professionals. (Gee et al., 2015.)

Assignments:

- There are also several obstacles for implementing the model into clinical practice at the primary level. Explore them: (Kadu & Stolee, 2015).
- Find out the connection between CCM and the Health Literate Care model https://health.gov/sites/default/files/2019-10/HLCM_09-16_508.pdf
- What CCM elements are included in the Guided care® model: Its advantages and disadvantages (Boult, Karm & Groves, 2008)?
- Find model modifications or uses to address a specific patient's health conditions.
- Discover the studies about the effectiveness of individual CCM elements (e.g. Reynolds et al., 2018).

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4.4 Transversal Skills and 21st Century Skills

Hilde Vandenhoudt and Pirjo Vesa

"We are currently preparing students for jobs that don't yet exist … using technologies that haven't been invented … in order to solve problems we don't even know are problems yet." This quote by Richard Riley summarises the challenges that institutes of education face in the 21st century.

We live in a VUCA world, a world that is highly volatile, uncertain, complex and ambiguous. The world is changing at a very high speed. History can no longer help us predict the future. Technological development, demography and migration, globalisation and the war for talent, a changing society and the pressure on natural resources shape the world in which young people are growing up. They have to learn how to live and thrive in times of great uncertainty. COVID-19 really helped us realise this need. 'As expected, everything runs differently.' In order to solve the 'wicked problems' or complex societal challenges of our time (sometimes referred to as 'the big E global problems: Education, Economy, Equity, Energy and Environment), we need T-shaped professionals.

T-shaped professionals possess thorough knowledge and skills in a specific discipline (e.g. nursing) in addition to skills in connecting and collaborating with people across disciplines and sectors, developing a broad perspective on the world and searching for solutions. The latter refers to transversal competences which are becoming more and more important in a globalised world. One needs to be agile, flexible and adaptive to a rapidly changing job market and develop a positive attitude towards lifelong learning. We are living in the knowledge age, and learning is indeed considered to be the skill of the future.

Transversal competences (in contrast to job-specific competences) can be defined as the knowledge, skills and attitudes relevant to a broad range of disciplines and work situations. These competences have been acquired in one context and can be transferred to another. In the EU VISKA project (n.d.), transversal skills are defined as 'the ability to work in a team, to communicate effectively, to be proficient in foreign languages, to be entrepreneurial, to be able to think creatively and to be able to solve problems.'

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The European Union defined 8 key competences for lifelong learning that every European should develop and continue to update throughout their lives. These include:

- Communication in mother tongue
- Communication in foreign languages
- Mathematical competence and basic competences in science and technology
- Digital competence
- Learning to learn
- Social and civic competences
- Sense of initiative and entrepreneurship
- Cultural awareness and expression

Transversal skills and 21st century skills are often used interchangeably. 21st century skills refer to the abilities and attitudes needed to achieve career success. A framework has been developed to include the key competences for the future, consisting of life and career skills, learning and innovation skills, and info, media and technology skills (Partnership of 21st century skills, n.d.). The knowledge-skills rainbow visualises these sets of skills (Figure 15).

At the core of the rainbow are the key subjects such as mother tongue, foreign languages, mathematics, economics, science, geography, history, and civics. In addition, interdisciplinary themes should be integrated into education in order to develop global citizenship, creating awareness of environmental challenges and sensitivity to social and cultural differences.

> Transversal skills and 21st century skills are often used interchangeably.
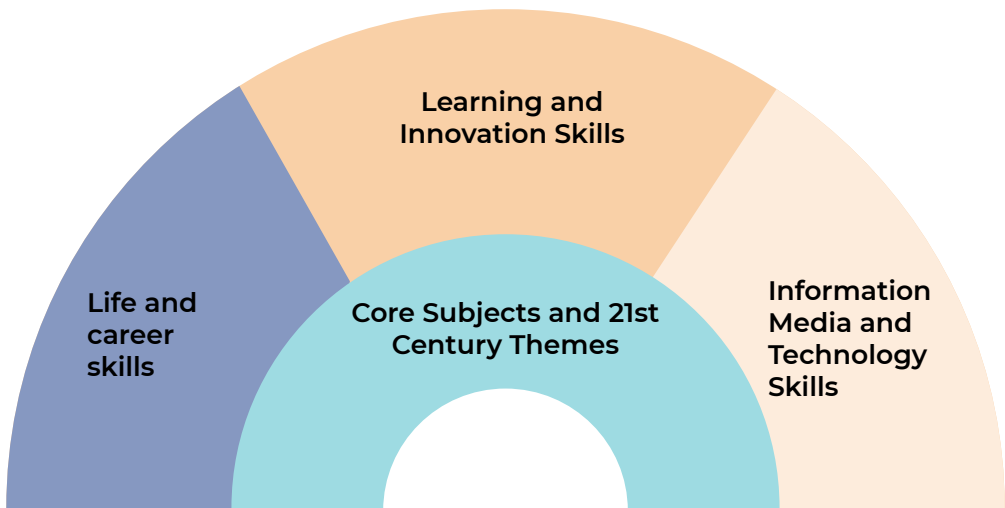
96

Figure 15. 21st century knowledge-skills rainbow (Trilling & Fadel, 2009, modified)

The second bow is divided into three sections:
Life and career skills including flexibility and adaptability (to expect the unexpected), initiative and self-direction in learning and working, social and cross-cultural skills, productivity and accountability, and leadership and responsibility. Learning and innovation skills include the 4 C's: critical thinking and problem solving, communication, collaboration, and creativity. Critical thinking requires reflection.

Digital literacy skills are at the core of the DigiNurse Model. They can be grouped into three categories. Information literacy includes skills in accessing and comprehending information, evaluating it critically and using it in a correct and creative way. Media literacy involves the analysis of different media messages with regard to construction and interpretation, as well as the creation of media products using appropriate tools in diverse settings and for diverse target groups. ICT literacy is about applying technology effectively. Across these categories, one needs to be able to consider the ethical and legal issues at hand.

Formal academic learning is currently the way of learning that is visibly validated. However, learning often happens in parallel in other learning

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environments, such as workplaces and in daily life. One can distinguish between non-formal learning (intentionally learning something new) in settings that are not formally organised or recognised to educate, and informal learning (when learning happens intuitively and organically, with no specific intention to learn).

Learning never stops. As the interconnected world keeps on changing, so too will we have to adapt and learn new content and skills. In the Dig-iNurse Model we assume that students have acquired basic interpersonal communication and digital literacy skills. However, not all nursing students of today are digital natives or net geners. More people start a new career at an older age. Therefore, we must be sensitive to the differences in digital literacy skills among students.

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Partnership of 21st century skills. (n.d.) Retrieved from: www.21stcenturyskills.org

5 The DigiNurse Model

The development process of designing the DigiNurse Model is described in the beginning of this chapter. Chapter 5.1 introduces several versions of the model and explains the journey to the final design. In Chapter 5.2 the content, functions and interconnected relations of the DigiNurse Model are explained. In the following chapters 5.3 to 5.8, the content of the DigiNurse Model and its key elements are presented in detail. The model contains the elements of health literacy and self-management, digital care and coaching with coaching models and technology and data care.

This chapter provides background material, assignments and discussion topics for teachers and students. Also, subchapters 5.6 and 5.7 contain empirical expert knowledge by a coaching professional.

5.1 The Journey of Developing a Common Model

Hilde Vandenhoudt

At the start of the project, the DigiNurse partners, selected from the four corners of Europe, realised that their nursing curricula showed particular differences. For example, in Slovenia and in Finland the training programme for a bachelor nurse is organised over a 3.5-year period, while in Portugal and Belgium it lasts four years. In Portugal, students first pass the theoretical courses and skills training before doing their internship in the final year of the training programme. In Belgium, Finland and Slovenia, internship is integrated into the curriculum from year one. In Belgium, the nurse as a coach is identified as an important role throughout the curriculum. This was less explicit in the curricula of the other partners. In Slovenia, the concept of coaching is not appearing in the nursing curriculum as such; rather, it is the role of the health educator that is integrated. Curricula also revealed variation into how technology and digital tools are integrated into healthcare education.

Against this background, the team took up the challenge to develop a model for ICT-supported nursing that can be integrated into all curricula,

in a variety of ways, regardless of the identified differences highlighted above. It proved to be quite a journey. Overall, developing the DigiNurse Model felt like having four funerals and a wedding. The developing process included four preliminary model designs before the final DigiNurse Model, which really felt like a marriage, at the end.

The team exchanged ideas during transnational meetings at the partner colleges, and during regular digital consultations. With regard to the development of the model, most progress was made during the face-to-face interactions. The partners also realised how important the 'in-between time' is, i.e. the informal moments, to get to know one another and better understand each other's views. This is a prerequisite to developing a common language.

A first hurdle to overcome was agreeing on the concept of coaching to be used in the project. It became clear that everyone had a different insight and perspective on the topic, based on their own experience in the curriculum. The diversity of the team enhanced lively discussions and brought a more in-depth understanding.

The elements of the DigiNurse project were put together into a structure and served as our first model (Figure 16). Looking back, it was more of a summary of the project ahead of us.

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Diginurse Concept	Methods/Tools	Iterative pilot studies and evaluation	Intellectual outputs
Project goals, Learning goals	Coaching methods the GROW model (incl. shared decision making), Appreciative inquiry, Spiderweb positive health	E-coaching model DigiNurse	International guidelines, integrating e-coaching
Literature review: Digital learning, teaching, coaching, self management			
Salutogenesis - Positive health	Teaching and learning methods Role plays, demonstations, learning by doing, interventions, student project	Digital platform	DigiNurse training model and website
Blended care	Innovation methods Living and Care Lab: co-creation Research co-creation	Internatioal collaboration and exchange	Dissemination: Workshops, Scientific publications, International

FIGURE 16. The 1st version of the DigiNurse Model (Layout by Vandenhoudt & Nevelsteen, 2018)

The partners identified important elements to include in the model and came up with three themes: coaching, technology acceptance and pedagogical approach.

A literature review was conducted on each of these themes. This provided a good insight into the critical elements to include in a second version of the DigiNurse Model. Based on advanced understanding, we connected identified themes using elements of existing models such as the dialogue tool of the Institute for Positive Health (2019) and a Dutch generic model of self-management support (LAZ, 2011). By combining these elements an enhanced model was developed. Step-by-step, a common understanding of 'coaching' was growing. Practical coaching exercises helped the team in moving towards a joint vision.

However, one problem with this model was that it felt too much of a model done by others. More so, there was no clear mention of digital care or coaching, the main focus of the DigiNurse project.

> With regard to the development of the model, most progress was made during the face-to-face interactions.
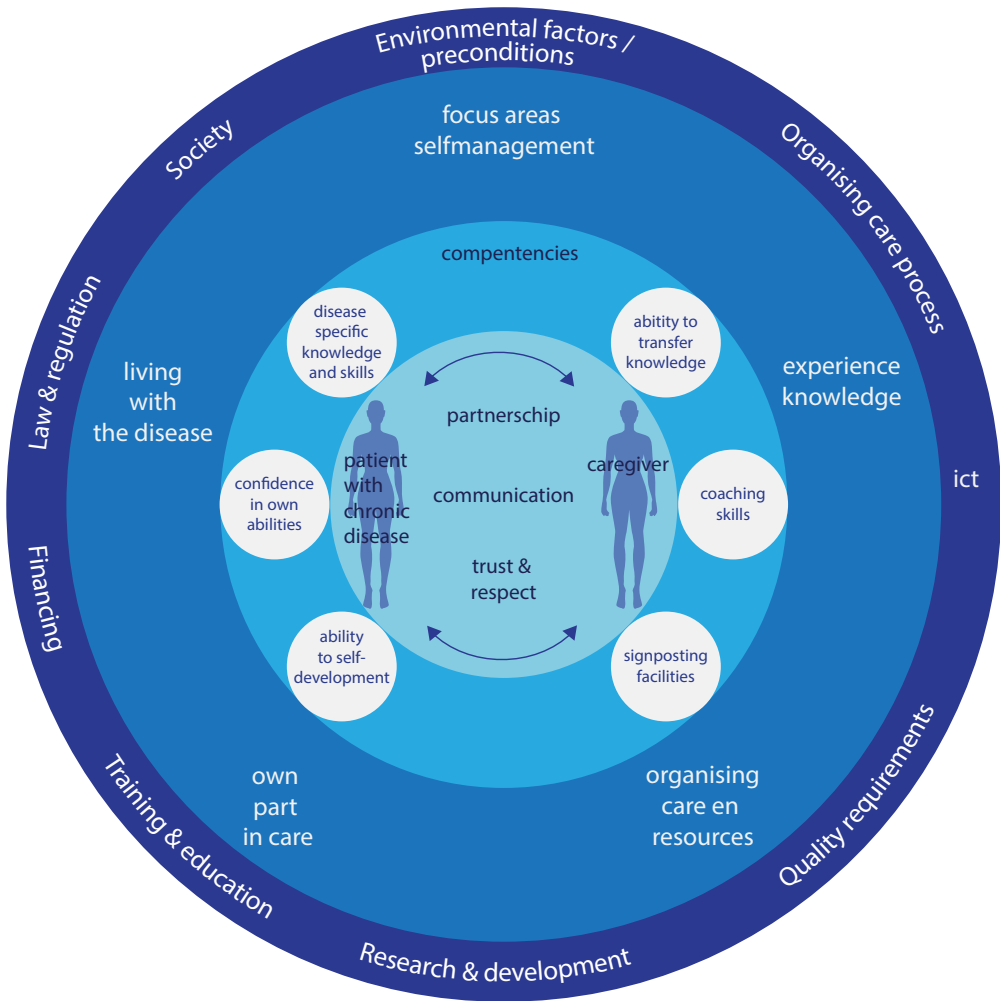
FIGURE 17. The 2nd version of the DigiNurse Model (Combined with the Generic Self-management tool by LAZ, 2011, modified. Layout by Vanden-houdt & Nevelsteen, 2018)

A new round of consultations brought the third model to light, whereby we used the image of a circle to portray patient-centredness. The coaching process between the patient and their care provider makes use of a blended approach, partly face-to-face and partly digital. The coaching models proposed were the GROW model and the 5 A's model. The dialogue between the patient and the care provider is placed at the centre of the DigiNurse. The context of the patient is also taken into account, including the formal (professional care team) and informal (significant others) care providers of the patient, as well as ICT-related infrastructure and skills that are needed to enhance digital exchange.

The coaching process starts with a conversation on the patient's perceived health using the dialogue tool of the Institute for Positive Health (2019). The aim is to support the patient in setting their own goals and develop a goal-oriented care plan through shared decision-making.

The SEPPS, or self-efficacy and performance in self-management support instrument, identified as a useful tool to measure the perceived self-efficacy and performance of care providers (or students) regarding self-management support, was added to the model.
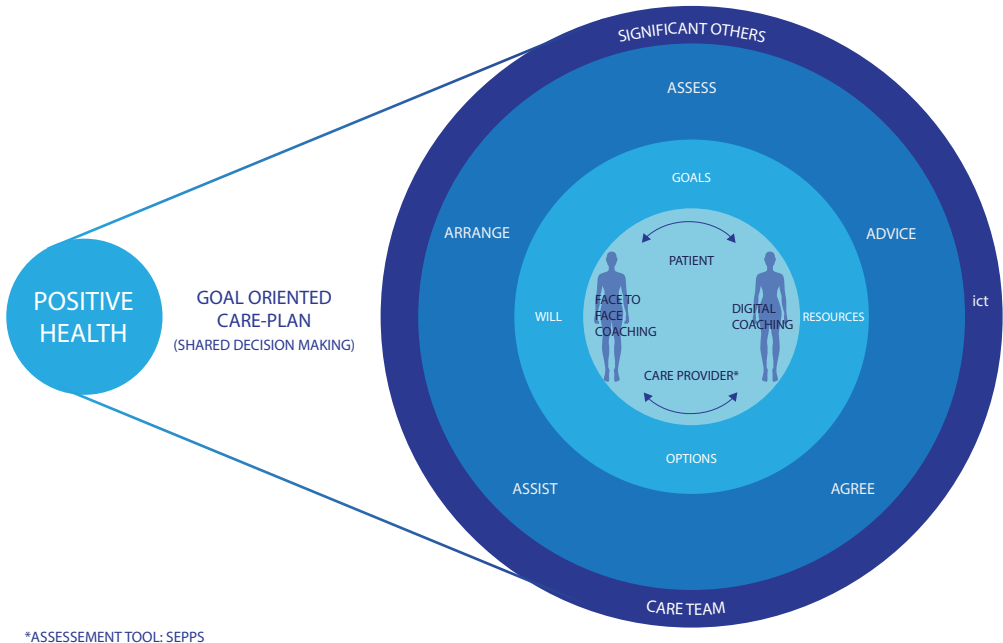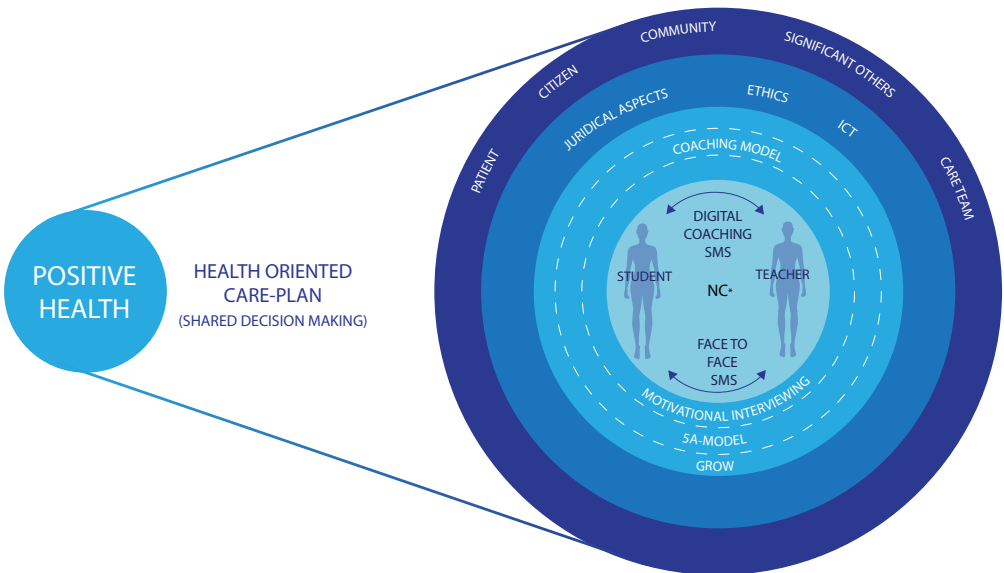

FIGURE 18. The 3rd version of the DigiNurse Model (Layout by Vandenhoudt & Nevelsteen, 2018)

However, we realised that the model focused on the person with a chronic disease and the healthcare professional, instead of a 'teaching model' that focused on the learning process of the student. In addition, some important themes were still missing in the model, such as ethical and legal issues concerning digital sharing of data, and health and digital literacy.

These were added to the fourth version of the DigiNurse Model. We differentiated between a teaching model, 4a (Figure 19), and a self-management support model, 4b (Figure 20). The DigiNurse Teaching Model of the nursing curriculum brought the teacher/coach and the student to the forefront in a hybrid environment, where coaching skills for self-management support were approached in a blended manner, including digital and face-to-face. Motivational interviewing was added as a third coaching model. And juridical and ethical aspects received a more prominent place.

The context, or learning environment, was broadened to include not only patients, their significant others and the care teams, but also citizens and the community. The starting point of the coaching process was still the dialogue about perceived health. The goal-oriented care plan changed to a health-oriented care plan, which was better aligned with the concept of salutogenesis.

NC: nursing curriculum
SMS: selfmanagement support

FIGURE 19. Version 4a the DigiNurse Model. DigiNurse Teaching Model (Layout by Vandenhoudt & Nevelsteen, 2018)

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The Self-management Support Model (Figure 20) focused on the citizen and care provider at the micro-level, and added elements of the broader ecosystem, such as policy and education, at the macro-level.
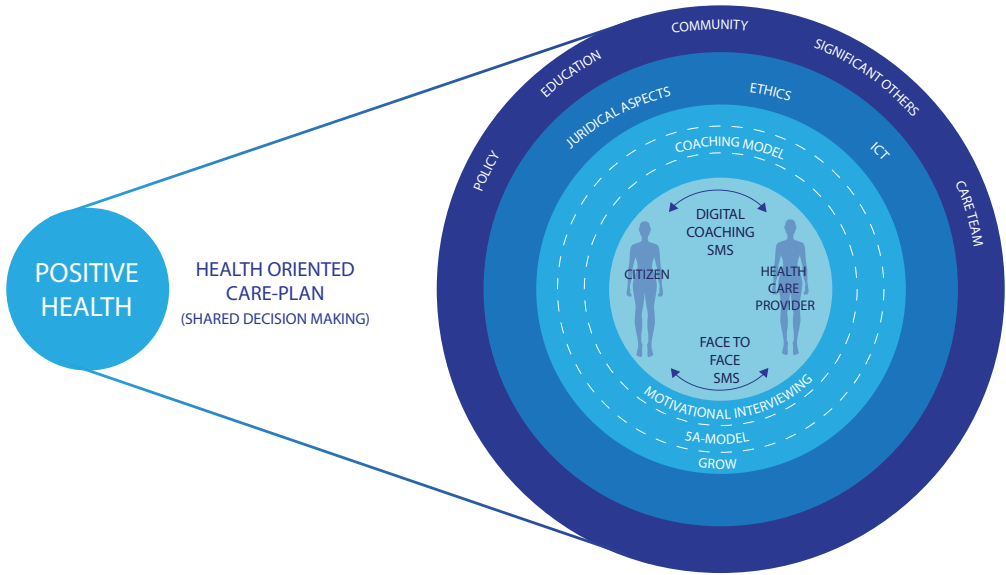
SMS: selfmanagement support

FIGURE 20. Version 4b of the DigiNurse Model. DigiNurse Self-Management Support Model (Layout by Vandenhoudt & Nevelsteen, 2018)

New input based on the lessons learnt from the two pilot waves with students made us adjust and re-discuss the model. After 2.5 years, we were still not satisfied. We decided to start afresh from a white sheet of paper. Through a group exercise we came up with a new model that included the basic elements identified by the team. After burying the four previous models, we now had a model that we were all satisfied with, and one that could guide nursing schools across Europe to integrate ICT-supported nursing into their curriculum. We finally had a marriage. We proudly present to you the fruit of this interesting journey, the final DigiNurse Model (More information in Chapter 5.2).
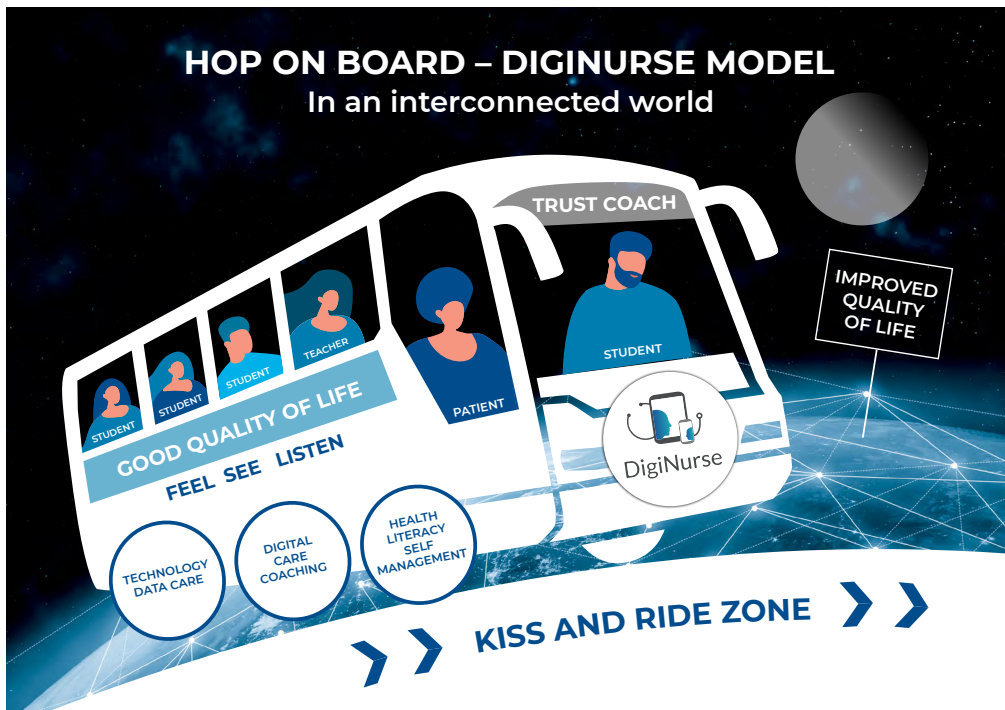
PICTURE 1: The final illustration of the DigiNurse Model (DigiNurse project team, 2020)

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5.2 Description of the DigiNurse Model

Hilde Vandenhoudt

In this chapter the DigiNurse Model is presented in a general fashion. Each section of the model will be discussed in a more detailed way in the following chapters. How can one best integrate training in ICT-supported nursing into a nursing curriculum? We thought it would be a good idea to come up with a model that connects all the critical elements of such a training. First, have a look at the picture of the DigiNurse Model. What do you see?
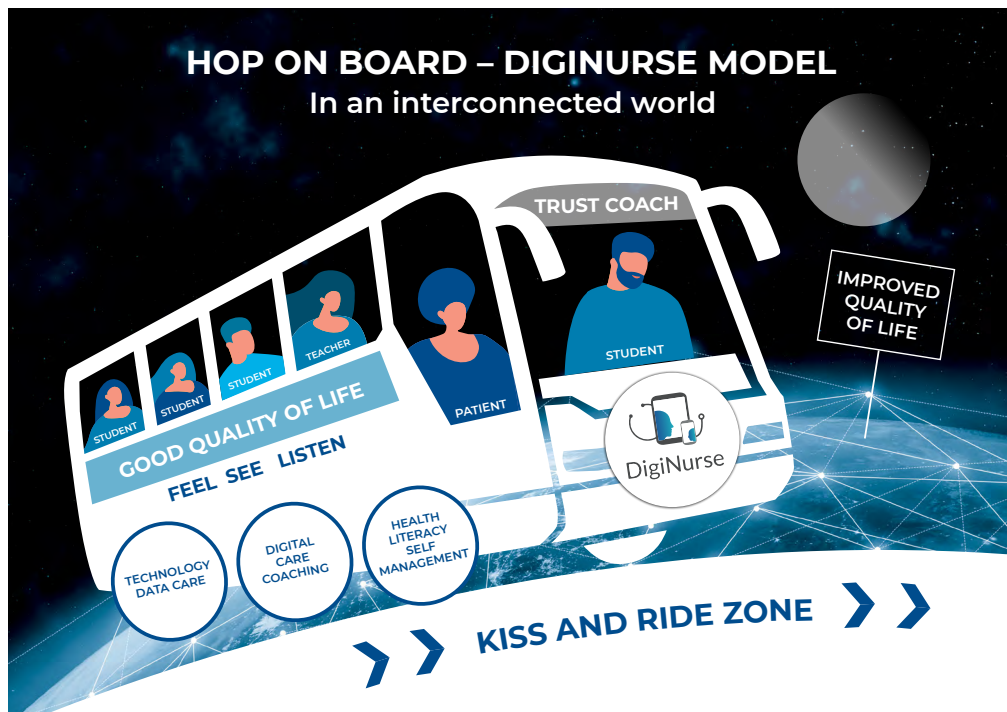
A flying bus in intergalactic space? The bus has passengers, wings and wheels that are connected. It seems to fly on its way to improved quality of life. And what is this KISS and RIDE zone all about?

Let's go on a discovery journey in the Trust Coach. We live in a global world that is interconnected. Technology and smart use of data are driving innovations in all domains of life, including healthcare. The COVID-19 pandemic brought a digital revolution. ICT-supported healthcare is no longer a future dream but day-to-day reality. Teleconsultations, apps for contact tracing, prescriptions and referral letters in your mailbox are the new normal. COVID-19 has forced us to make it all possible. But are our students ready to join this digital healthcare revolution? What are the skills they need to implement digital self-management support to patients with a chronic health condition?

Of course, students enter the nursing education programme with a backpack full of knowledge, skills and attitudes, acquired during their time at school and in life. They have gained experience in communication and collaboration, as well as other 21st century skills such as critical thinking and problem solving, and information, media and digital literacy (More information in Chapter 4.4). In the DigiNurse Model these key competences for the future are considered the foundation. One does not need to be an expert in these domains, but basic knowledge and skills are assumed.

The vehicle or the DigiNurse Trust Coach is moving in the universe, representing the technology-driven, globalised and digitally interconnected world in the present and future. In the Trust Coach you can find a student in the driver's seat, the teacher or coach, other students and patients. The teacher or coach provides support to the driving student. Altogether they form the DigiNurse learning community. In the "Trust and Sharing zone," all are equal partners and learn from each other in a safe environment.

The wheels of the bus go round and round, or do they? The Trust Coach speeds forward with three interconnected wheels. Each wheel represents an essential component of ICT-supported nursing and is related to the others. One wheel cannot turn around without affecting the others.

The first wheel of the DigiNurse Coach represents Health literacy and self-management. Health literacy is the ability to access health-related information, understand it, critically investigate its relevance and use it to make decisions about one's own health (More information in chapters 5.3 and 5.4). To assess the level of your patient's health literacy is very import-

ant. As a nurse, one needs to adjust the information and health education to the language the patient uses. In addition, one needs to check if the patient understands you (by using for example the teach-back method). Patients with low health literacy may find it difficult to gain insight into their condition and take up self-management. They will need more support. Digital health literacy or e-health literacy focuses on electronic sources of information.

But what exactly do we mean by self-management? In general, self-management refers to 'taking responsibility of one's own behaviour and well-being.' In relation to students and DigiNurse, it means that students are responsible for their own learning process in ICT-supported nursing. Similarly, students will learn how to support patients taking up responsibility in self-management.

The second wheel of the DigiNurse Coach represents Digital care and coaching (More information in chapters 5.5 and 5.6). Digital care, or where digital technologies connect with care, is considered as any form of care provided from a distance. It requires communication methods (e.g. emails, telephone, text messaging, social media applications/WhatsApp). Students will learn how to apply these methods to professional use and how to integrate digital interactions into the coaching process. DigiNurse combines face-to-face care with digital care and promotes a blended approach.

Coaching, or unlocking a person's potential, is the skill at the centre of DigiNurse. Students will learn how to become a skilled and supportive companion to patients. This requires an important mind shift. Students will need to release their role of expert and embrace the fact that the persons being coached know what they want and need. It is important that students experience both sides of the coaching process: being a coach and being a coachee. Such experiences will help them gain insight into the difficult process of behaviour change and create empathy and patience. Teachers and students will have to learn to move at the pace of the coachee (students for teachers, patients for students).

The third wheel of the DigiNurse Coach represents Technology and data care. In DigiNurse, we assume that technology (including software and hardware) is everywhere (omnipresent) and a reality in healthcare (More information in Chapter 5.8). Students will experience integrating health technology (e.g. devices, apps) into daily healthcare, and learn how to apply this technology to increase empowerment and self-management.

Students will reflect on the importance of data protection. Ethical and juridical aspects of sharing personal (medical) data will be addressed, focusing on the consent of data use and safe data access. Students will gain confidence in good data care.

The Trust Coach moves through the Milky Way to improved Quality of Life along the KISS and RIDE zone. This zone explains the methods that will be applied to help students develop coaching skills. In the KISS and RIDE zone, students will first practice in small groups of two or three students with a rotational role of coach, coachee and observer (More information in Chapter 6). Ideally, these coaching exercises are videotaped and used as debriefing, feedback and assessment material. Reflection on these exercises is very important for students' personal development. The theoretical models underlying the DigiNurse Model are explained in the following chapters. Students will be encouraged to go through selected materials of the e-book in advance to get acquainted with the concepts and structured coaching models used in the DigiNurse Model. These home assignments prepare students better and will help to optimise the effect of the coaching exercises.

The KISS and RIDE zone consists of the following elements:

KISS stands for 'Keep it Simple and Smart'. Applying technology to support self-management can only work effectively if it is accessible, intuitive and user-friendly. RIDE is an acronym that stands for the key concepts of the DigiNurse training model:

R-RELATE: Students practice how to relate with the other person, respect their views and respect the pace at which they are willing to take steps in the coaching process.

I-INNOVATE: DigiNurse encourages students to have an open mind to innovation. Students explore how new technology, innovative communication channels and new ways of collaboration can be integrated into the healthcare process.

D-DEVELOP: Represents the student's personal development throughout the coaching process by experiencing the effect of coaching on their own behaviour and that of the other person. DigiNurse makes the learning journey as personal as possible, by providing individual feedback and enhancing personal growth.

E-EQUIP: Students are equipped with the knowledge and skills to make smart use of the digital environment. Students exchange experiences with nursing students in partner institutions across Europe. These skills will prepare them for the future where digital care will become (or is becoming, courtesy of COVID-19) the new normal.

The engine of the coach is trust, a resource that is vital to building rapport and creating a safe environment for people to interact. Building rapport requires active listening skills (hear), good observation skills decoding non-verbal communication (see) and showing empathy (feel).

The aim of the DigiNurse Model is to equip students with the knowledge, skills and competences that focus on improving and supporting the quality of life, as defined by the patients themselves. It requires that students see patients as experts by experience. Students act as the buddy or companion of the patient.

It also requires a mind shift of teachers/coaches regarding the integration of technology into the learning process and the interaction with students. Teachers should develop an open mind to new technology and create opportunities for students to practice and build confidence using this technology as part of the healthcare process. The interaction between teacher and students should mirror the interaction between the student and the patient. Teachers need to build rapport, listen actively and adjust to the pace of the student. It is important that teachers do not fall into the trap of giving advice and trying to solve problems themselves. They should use their coaching skills to be a companion in the learning process of the students. In the DigiNurse Model, teachers need to learn how to coach students to coach patients, instead of teaching students to teach patients.

Ten practical recommendations on the integration of the DigiNurse Model into the nursing curriculum:

1. Develop a common language on basic concepts of the model, and use these throughout the curriculum
2. Set clear goals on what you wish to achieve with your students
3. Create a safe and trustful environment where students can practice, practice, practice
4. Provide feedback on the coaching skills of students (applying coaching models are a means, acquiring coaching skills is the goal)
5. Coach students instead of teaching them. Students need to self-direct their learning journey. This is a mind shift needed in education AND healthcare
6. Develop a stepwise trajectory so that students grow in their coaching skills and become more confident throughout the curriculum. One way to approach this is to first focus on getting to know oneself better, second to practice in a safe and controlled environment, and finally practice in real-life situations where students meet with patients and become skilled companions. Accept the pace at which the student is able to gain insight
7. Apply the same guiding principles of self-management support for patients to the learning experience of students:
   a. Accept the pace at which students gain insights and acquire coaching skills b.
   Work with the input of students in the sessions rather than your own input
   c. Explore and decelerate; inquire appreciatively and let the students find answers/solutions themselves. Be their skilled companion
   d. Combine face-to-face interaction with online interaction. Use digital tools that are familiar to both your students and yourself for interaction and feedback
8. Create opportunities (in collaboration with living labs or partners in education) to test digital tools and devices with students
9. Involve patients as an active partner in your learning community to share their needs and to inspire nursing education
10. Join the international DigiNurse Community and set up an online exchange between students of different nursing schools on topics such as digital coaching skills (internationalisation@home)

5.3 Health Literacy

Marija Milavec Kapun and Tina Gogova

One section of the DigiNurse Model is Health Literacy and Self-management, which is illustrated as one of the wheels in the DigiNurse Coach (Picture 1). Health literacy has been recognized as a key determinant of the health and wellbeing of the individual and society. It is a set comprised of knowledge, practical skills and self-confidence to take action to improve or maintain health and wellbeing by changing one's lifestyle and living environment. Health literacy is crucial for the patient's active role (Brach et al., 2012). This indirectly influences the healthcare system and the whole society.

Limited or low health literacy has negative consequences on an individual's health, social gradient, reinforces inequalities, and causes premature death, security issues, lower adherence to treatment and is associated with high healthcare system expenditure (Brach et al., 2012). The concept of health literacy goes beyond the individual patient and involves the interaction of the patient with the healthcare professional or the healthcare system.

Successful self-management of the patient with chronic disease is based on an adequate level of health literacy (Wang, Lang, Xuan, Li, & Zhang, 2017). Nurses have an important role in taking care of patients with chronic disease and elevating patients' self-care ability also through addressing patients' (digital) health literacy.

Health literacy in a digital environment

The expression "health literacy" was first used in a discussion on health education as a policy issue affecting the health system in 1974 by Simonds (Peerson & Saunders, 2009). Many different definitions and different types of health literacy have since emerged. One of the first definitions is from the WHO (1998) in the Health Promotional Glossary: "Health literacy implies the achievement of a level of knowledge, personal skills and confidence to take action to improve personal and community health by changing personal lifestyles and living conditions. Thus, health literacy means more than being able to read pamphlets and make appointments. By improving people's access to health information, and their capacity to use it effectively, health literacy is critical to empowerment."

Health literacy means having knowledge and skills to access, understand, appraise and apply information to health-related decisions made

on a daily basis, health promotion activities dedicated to the quality of life throughout a person's life span (Sørensen et al., 2012). A prevention aspect of health literacy is concerned with the promotion of an individual's health, on one hand, through knowledge of risk factors and changing patients' health behavior and lifestyle, and on the other, through enabling patients with chronic non-communicable diseases (or other conditions) to manage their condition independently and have a better command of their health and wellbeing issues or respond to unexpected, health-related situations that might come up (Kickbusch, Pelikan, Apfel, & Tsouros, 2013). This makes health literacy is an important determinant of health (Van Der Heide et al., 2016).

Limited or low health literacy is defined as inadequate or problematic health literacy (Kickbusch et al., 2013). Adults with limited health literacy are associated with greater inequities in health, and less participation in prevention programs and disease detection activities. They have worse preventive care and their children's health outcomes are poorer. They are characterized by more risky health choices and behaviors, more work-related accidents, reduced management of chronic diseases, poor adherence to treatment and more serious treatment errors. In addition, they have higher rates of emergency care visits and hospitalizations, rehospitalizations, increased morbidity and premature death compared with individuals with adequate health literacy (Brach et al., 2012). Unintentional non-adherence to treatment, difficulties with informed consent and patient-provider communication, and difficulties with discharge instructions, are also challenges related to limited health literacy (Farmanova, Bonneville, & Bouchard, 2018).

Most of the patients with a chronic disease are older. They also form a highly heterogeneous group regarding their health literacy. As a result, the strategies aiming to improve their understanding of health information need to be individualized and there is a need for introducing a holistic approach to address this matter. Particular attention should be paid to vulnerable persons and those with a lower level of education or low income, and persons without health insurance (Kobylarz, Pomidor, & Pleasant, 2010; Berkman et al., 2011; Touhy & Jett, 2014).

Quality of care could be improved if healthcare organizations would be developed for better health literacy responsiveness, delivering care in a way that supports the best practices of health literacy and does not require advanced health literacy skills from the patients (Farmanova et al., 2018). Healthcare system and organizations have potential to improve their

activities to become health literate organizations. In a health literate organization, health literacy is considered an organizational value which integrates health literacy into planning, evaluation measures, patient safety, and quality improvement efforts (Brach et al., 2012). Organizational health literacy should be incorporated into all organizational changes that aim at person-centered and evidence-based care. It should be used as a strategy to improve health outcomes and quality of care, and to contain and reduce the cost of care (Farmanova et al., 2018).

Nurses are an important part of the healthcare system as they are most often in contact with the patient and can significantly contribute to a higher level of health literacy through the implementation of appropriate interventions (Dufour, Lacasse, Chouinard, Chiu, & Lafontaine, 2019). When digital technologies are applied in nursing, the nurse's knowledge and skills related are important for the successful integration of the technological solutions. Therefore, students must acquire an appropriate level of digital literacy during their education.

Digital literacy / Digital (health) literacy

Various digital technologies (computers, mobile devices, wearables, internet and social media (blogs, wikis and social networking sites) have become a nearly irreplaceable part of our lives. Due to their high accessibility and ubiquity, digital technologies provide us with instant and time-unlimited information and data than any other solution ever to have existed in human history.

> When digital technologies are applied in nursing, the nurse's knowledge and skills related are important for the successful integration of the technological solutions.

Digital technologies are becoming more and more important as a source of healthcare. As a result, there is a need for new knowledge and skills to incorporate these in the daily lives of patients coping with health issues as well as the work of healthcare professionals. The technologies have great potential for empowering patients in implementing self-care and to take responsibility for their health and to encourage patients' participation in their healthcare (Mitsutake, Shibata, Ishii, & Oka, 2016). An individual with appropriate knowledge and skills acquired through searching for health information, will find it easier to make appropriate decisions about their health-related behavior (e.g. frequency of doctor's appointments) (Pingree et al., 2010; Ritterband, Thorndike, Cox, Kovatchev, & Gonder-Frederick, 2009). More and more healthcare institutions and organizations are using different digital technologies to support patients and the public in the area of health and wellbeing.

The terms "Digital health literacy" and "eHealth literacy", are often used interchangeably. The terms seem to have emerged in connection with the development of related technologies. While eHealth literacy is based on the principles of basic health literacy, it focuses on using electronic sources of information. eHealth literacy reflects individuals' ability to seek, understand and evaluate health information from electronic sources, and use the acquired knowledge to address or solve a health problem and consequently achieve better health outcomes (Zhou & Fan, 2019; Norman & Skinner, 2006). eHealth literacy is not static and is constantly changing. It is influenced by individual characteristics, such as gender, age, education as well as individuals' activities, skills and experience on using the internet and digital devices (Norman & Skinner, 2006).

The components of eHealth literacy have been presented in the Lily model (Norman & Skinner, 2006). The model includes general skills (traditional or basic, media and information literacy), and specific skills (health, computer and science literacy) (Norman & Skinner, 2006). This model has been updated to include cultural, social and situational contexts (Gilstad, 2014) which are important for improving the digital literacy of patients (Figure 21).

Communication expertice

Health literacy

Information literacy

Traditional literacy and numeracy

eHealth literacy

Science literacy

Computer literacy

Media literacy

Type of health question

Cultural content > literacy

Institutional content > literacy

Type of eHealth technology

Propositional literacy
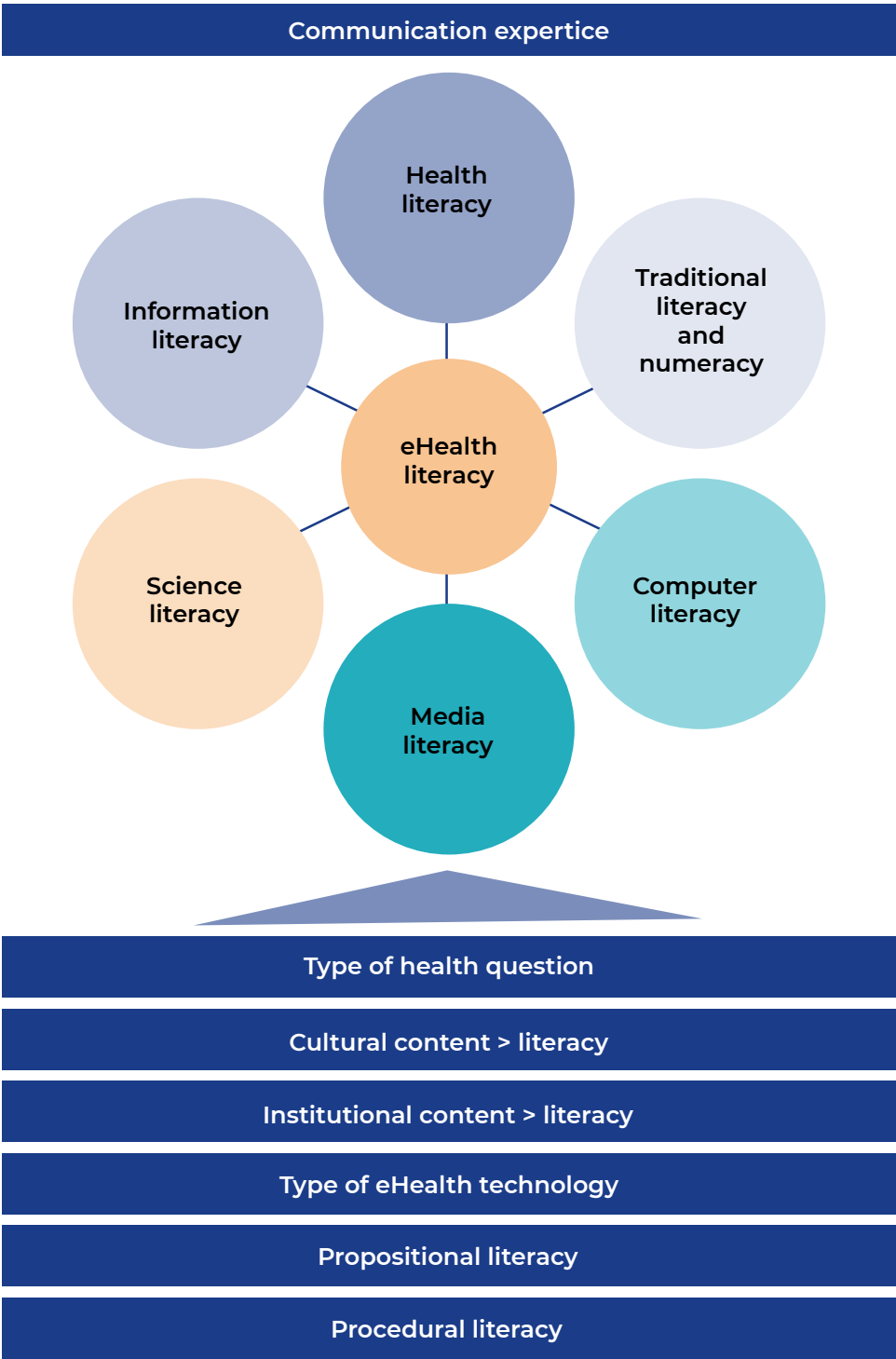
Procedural literacy

FIGURE 21. eHealth literacy model (Gilstad, 2014, modified)

Practitioners, funders and policymakers should consider that a successful implementation of digital health services requires in-depth understanding of the factors involved in e-health literacy, such as a broad range of features relevant to planning, design and development of e-health services and the individual's ability to use and benefit from digital health technologies (Norgaard et al., 2015). The users of digital technologies are more or less actively involved in related development. However, due to extremely rapid development of digital solutions, we were not able to define rules and guidelines on how to use these technologies. The use of digital solutions has nonetheless been supported most by a participatory action research approach that provides the patients with an important role in the developed digital solutions.

A patient with a chronic noncommunicable disease (CND) who is literate and familiar with digital technologies can be empowered in implementing better self-management with approaches described in the DigiNurse model. (Figure 22).
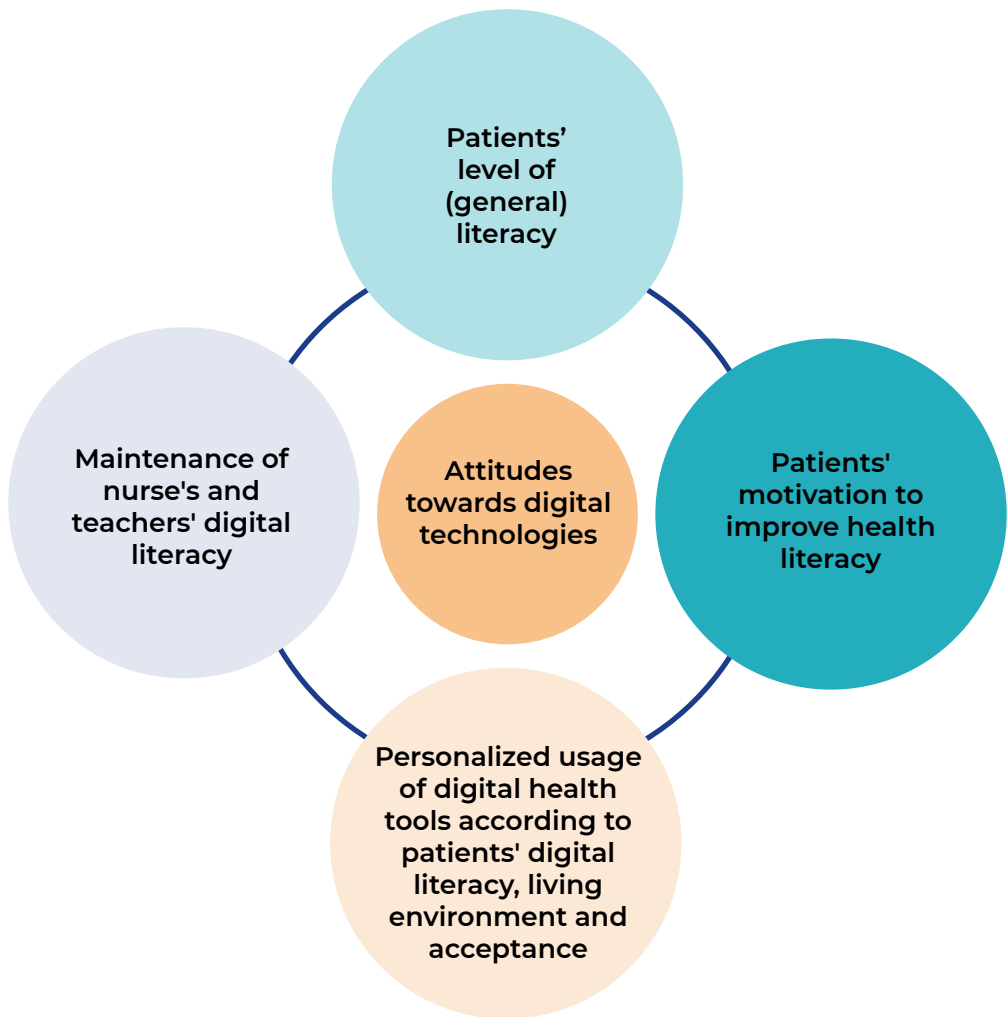
FIGURE 22. Digital health literacy considerations in nursing education and patient care

Conclusions

The advancement and development of technology has enabled the development of digital health solutions, or e-health. Digital care is presented in more detail in Chapter 5.5. The availability of various digital tools and applications potentially used in new approaches to patient care requires for both healthcare professionals and patients to have an adequate level of digital health literacy. This is an essential part of the empowerment of

patients with a chronic disease to implement self-care. This has a positive impact on patients and their families, the healthcare system and the society as a whole.

Nurses play a crucial role in empowering patients' self-care during both health and illness. This makes it important for nurses to have sufficient knowledge and skills to incorporate available technology into their work with patients.

Recommended reading

Explore the importance of health literacy in different strategies and declarations regarding public health and with connection of health behaviour, e.g.:

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5.4 Self-management

Nina Smolander, Annukka Isokoski,
Marija Milavec Kapun and Tina Gogova

One section of the DigiNurse Model is Health Literacy and Self-management, which is illustrated as one of the wheels in the DigiNurse Coach (Picture 1). Self-management refers to actions when people are actively participating and taking responsibility for their behaviour, well-being and decision-making (Culter & Collins, 2011). The term has been used since the 1960's, firstly in connection with rehabilitation related to chronically ill pediatric patients emphasising the patients' active role (Creer, Renne, & Christian, 1976). In terminology, self-management and self-care are often used interchangeably, and definitions have multiple dimensions (Jones, MacGillivray, Kroll, Zohoor, & Connaghan, 2011). However, a distinction is often made based on actions taken independently or in collaboration with healthcare professionals. The term 'self-management,' which is especially connected to chronically ill patients, is frequently used when functions are planned and performed in collaboration with healthcare providers. In contrast, the term 'self-care' refers to actions and decisions about health and well-being performed independently without the interaction of healthcare professionals. (Schulman-Green et al. 2012.)

In the healthcare field, self-management is considered a comprehensive approach (Grady & Gough, 2014). It originates from patients' perceptions of their chronic conditions, the challenges experienced by them (Lorig & Holman, 2003) and patients' need analysis. It is a dynamic concept and includes various continuous processes in the medical, behavioural and emotional areas (Schulman-Green et al., 2012). In the DigiNurse Model, self-management is defined broadly as "individuals caring for themselves actively with the chronic disease(s)".

Self-management comprises several functions aiming to achieve the best possible situation in health and life for each individual patient. They consist of cognitive, behavioural and psychological requirements in cultural, social and organisational contexts. The healthcare professionals' core task in patients' self-management support is to act as a facilitator and support patients live as well as possible with their chronic condition, even when the patients' decisions don't level with the recommended advice (Morgan et al., 2017). In short, the self-management support is an ethical requirement for quality nursing (More information in Chapter 4.1); it is simply the correct thing to do for patients (Culter & Collins, 2011).

Through self-management support patients get encouraged with informed decision-making while deepening the understanding of symptoms and risk factors and their control (Mulligan et al., 2019). The healthcare professionals provide the support in the form of knowledge in illness needs and information of various interventions and activities of care (Schulman-Green et al., 2012). Also, it is fundamental that the nurse is aware of the potential barriers impeding the implementation of the care plan (Nagelkerk, Reick, & Meengs, 2006).

The cognitive self-management functions include the patients' ability to handle their condition and symptoms to perform health promoting activities and make informed decisions (Riegel, Jaarsma, & Strömberg, 2012). They need comprehensive information about their condition, care and expected lifestyle changes. They must have adequate skills to manage their treatment and medication and monitor themselves. (Jonkman et al., 2016; Mulligan et al., 2019; Riegel et al., 2012.) Educational process within self-management support is essential to develop and enhance these self-management skills. An individual's health literacy should be assessed to enable access, understanding and utilisation of health information (More information in Chapter 5.3). Equally, the healthcare services need to provide reliable and understandable information to patients with variable backgrounds and health literacy competences (Schulman-Green et al., 2012).

In addition to knowledge and skills, various other factors influence the self-management of a patient with a chronic condition: individual characteristics, motivation, health literacy (More information in Chapter 5.3) and resources, environmental and societal aspects, and the healthcare system.

> The cognitive self-management functions include the patients' ability to handle their condition and symptoms to perform health promoting activities and make informed decisions (Riegel, Jaarsma, & Strömberg, 2012).

(Schulman-Green et al., 2016.) The motivation of self-management mainte-nance and treatment care must be intrinsic and supported by healthcare teams whenever necessary. People's habits, cultural beliefs, self-confi-dence on self-management added to competence, skills and widespread support form a fundamental basis for the self-management process. (Riegel et al., 2012.) The importance of the support from significant others, community and healthcare organisations has been emphasised strongly and adds valuable benefits to self-management (Grady & Gough, 2014).

Self-managing and living with a chronic condition comprise various lifestyle changes and coping with chronic illness in all aspects of life. In addition to healthcare and psychological resources, other personal re-sources may need to be activated, e.g. spiritual and community resources, to integrate the chronic condition into everyday life in an adaptive and meaningful way. (Schulman-Green et al., 2012.) It is the healthcare team's responsibility to encourage patients and their significant others to express their needs, feelings and perceptions and provide enough space and time for questions and information processing (Politi & Street, 2011). This will empower the patient and enable the implementation of a personalised care plan that increases the patient's commitment to self-management (Politi & Street, 2011; Barry & Engman-Levitan, 2012).

One of the fundamental processes in self-management is patients' ability to make decisions about their care and life while having a chronic condi-tion. Both terms, shared decision-making and collaborative decision-mak-ing, have been used in the research literature, and the definitions are overlapping and vague at times. These concepts compliment rather than compete with each other. In both concepts the patient's role as an expert of their own condition (Jimison & Gordon, 2016) and in active participation in decision-making is recognised. Similarly, the communication between patient and healthcare professionals makes up a significant part of both definitions. The information of the patient's condition is provided and dis-cussed openly together with the healthcare professionals and the patient. In collaborative decision-making, the emphasis is even more on the effort of working together with the patient to achieve a common, collaborated goal. (O'Grady & Jadad, 2010.) This requires enough cognitive and commu-nicative capacities from both parties (Politi & Street, 2011).

Healthcare professionals need to have enough clinical expertise and abilities to deliver the information in an understandable, patient-centred and unbiased way. The most comprehensive clinical evidence should be discussed with patients honestly and understandably, including ex-

planations of all the treatment possibilities, even those with uncertain and insufficient clinical evidence and contradicting recommendations. This will provide ample information to patients and strengthen the trust between the healthcare team and the patient, even if the information is complex and difficult. On the other hand, the patients' capacities and state of mind might affect the receiving and processing of the information and acceptance of the presented options. (Politi & Street, 2011.) Patients might consider their decisions, be well-informed and have evidence-based knowledge or make the decisions emotionally or on autopilot without pondering the reasons or responses. Still, even well-informed and experienced patients may choose to go against the recommended health advice if the decision is based on contradicting values or reasons. The recommended advice may simply be out of the patients' reach. (Riegel et al., 2012.) The best possible equality of the encounter between healthcare professionals and patients generates mutual understanding and pertinent means for the patient's decision-making. The delivered information is incorporated into the patient's needs, values and preferences. (Culter & Collins, 2011.)

In collaborative management of a chronic condition, smooth interaction and information exchange between the patient and healthcare provider is important, and technology offers expanding opportunities to ease this (More information in Chapter 5.5) (Jiang & Cameron, 2020). Constant development of digitalisation brings new opportunities to support self-management through a variety of applications, platforms and technological interventions. They support the management of chronic conditions by integrating tele-monitoring to care. This makes self-monitoring and record-keeping easier, and following the trends in data and receiving instant feedback helps to adjust care and medication, accordingly increasing the autonomy of the patient in their own care. (Jiang & Cameron, 2020.) In addition, the information exchange improves as the real-time data sharing with care providers is possible (Hsu et al., 2016).

Technological interventions provide usable information on self-tracking several measurements and values not always directly in relation to the care of a chronic condition, e.g. sleep or stress. For example, the use of wearable self-tracking devices has spread health and well-being technology among the larger user groups. Even though health, well-being and fitness may not be the most important reasons to use these devices, ease of use, own personal interest and enjoyment are significant determinants. There is also a difference in user preferences based on gender. Female users are more health-tracking-oriented compared to males, whose interest in usage has

risen from technological specifications of wearable devices. Young people (<25 years) took wearables more seriously than the older generation, and support for well-being was a significant reason to start using them. (Pfeiffer, Entress-Fuersteneck, Urbach, & Buchwald, 2016.) Information regarding the user preferences might help with motivating patients to start using the wearable devices and other technical interventions.

The patients' experiences in using digital self-management interventions, such as tele-monitoring devices providing physiological data on blood sugar, blood pressure or activity, are promising. Patients feel well-cared for and assume a more active role during follow-ups and generally in their self-management. The usage of digital self-management interventions provides information for healthcare professionals that they can utilise for the patients' benefit. This helps in controlling medication management and above all improves patients' self-efficacy. In addition, the self-monitoring of physiological data supports the behavioural changes needed in the patient's life. (Morton et al., 2017.)

The need and recommendations of self-management and self-management support have been researched and discussed in the literature for decades. Regardless of the consensus of its significance, there is a concern of the implementation in healthcare being questionable and insufficient, (Loriq & Holman, 2003; Morgan et al., 2017; While, 2019) and sporadically implemented (Culter & Collins, 2011).The reasons for hindering and withholding the implementation of structured usage of self-management support include several myths. Patients are believed to be uninterested in self-management or the self-management support is seen as a doctor's duty only. There are misconceptions of self-management being a simple task, easily taught and learned from materials or incompatible with clinical practice guidelines. (Légaré & Thompson-Leduc, 2014.) Some even think self-management support doesn't make any difference to the patients' lives (While, 2019) and doesn't involve patients' emotional support. Other common excuses for not integrating self-management support to daily nursing are the lack of time or misconceptions of performing effective support automatically. In addition, there are doubts whether self-management support has any real cost-effectiveness compared to the time invested in it. (Légaré & Thompson-Leduc, 2014.)

There is no evidence supporting these myths or excuses (Légaré & Thompson-Leduc, 2014). Patients do have an interest in their self-management, and their knowledge and skills improve if interventions e.g. last long enough (4-8 weeks) and are delivered by professionals and even with the

help of peers (Mulligan et al., 2019). Through different self-management support interventions, motivation to care, trust in own skills and knowledge on diet, symptom control and lifestyle were found to be enhanced among chronic kidney patients (Donald et al., 2018). Equally, the control of asthma and lung functions resulted in improvement as patients participated in the Internet-based self-management programme (van der Meer et al., 2009).

Consequently, the self-management interventions do have cost-effective results, but these results must be assessed carefully. The self-management interventions vary, and comparing the effectiveness may be difficult. (van Eeden et al., 2016.) For example, nurse-led intervention enhanced breast cancer patients informed shared decisions and willingness to participate in decision-making. This resulted in opting for less invasive and less expensive procedures. (Berger-Höger, Liethmann, Mühlhauser, Haastert, & Steckelberg, 2019.) The lower procedure rates may decrease the financial income in hospitals, which creates an ethical dilemma if self-management support is thus neglected (Culter & Collins, 2011).

Well-performed self-management of chronic conditions brings benefits to both patients and healthcare providers. The healthcare system benefits from reduced costs due to decreased visits and admissions, and decreased complications. (Culter & Collins, 2011.) More importantly, patients gain higher self-confidence and control over their lives and well-being (Jimison and Gordon, 2016). Strengthening the patient's self-efficacy, autonomy and ownership of managing their chronic condition is important (Mulligan et al., 2019) and has a positive impact on the patient's health outcomes and quality of life (Jimison and Gordon, 2016).

Self-management, and its support with applicable self-management interventions, is a long-term and persistent process, but it should not be rigid. Healthcare professionals must maintain the contact with their patients, the patients' support network and the surrounding team of care providers, and tailor the support by recognising patients' fluctuating needs. The capability to react and be proactive in a flexible manner creates a wide spectrum of self-management support and utilises the resources effectively for the patient's benefit (Rotheram-Borus, Ingram, Swendeman, & Lee, 2012; Schulman-Green et al., 2012.) as well as helps patients navigate in applying the Chronic Care Model to reality (More information in Chapter 4.3). Therefore, healthcare professionals and organisations should engage themselves strongly to self-management support programmes and education (While, 2019).

> Healthcare professionals must maintain the contact with their patients, the patients' support network and the surrounding team of care providers, and tailor the support by recognising patients' fluctuating needs.

In the DigiNurse Model (More information in Chapter 5.2), we suggest the use of the Chronic Care Model to provide a framework for professionals' self-management support and coaching as an approach to collaborative decision-making with coaching models as practical tools for it (More information about the Chronic Care Model in Chapter 4.3. and about coaching in 5.6 and 5.7).

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5.5 Digital Care

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One section of the DigiNurse Model is Digital Care and Coaching, which is illustrated as one of the wheels in the DigiNurse Coach (Picture 1). With the digitalisation of healthcare, the role and responsibilities of the individual for their own health and well-being are changing.

This also changes the role of healthcare professionals and the way of performing various healthcare services (Roza et al., 2019). In the past, nursing interventions regarding a patient's self-management support were carried out in direct contact with the patient. Nowadays many nursing interventions are performed remotely with the help of digital technologies and the Internet. In addition, the patient coaching applied by the nurses is an increasingly greater part of the nursing profession. The patient's self-management support is certainly one of the foundations that can help reduce the need for formal care (Martin & Finn, 2011). Therefore, it makes sense to develop this part of patient care with available technology and nurses' up-to-date coaching competence.

Who or what is in the centre of digital nursing care?

In healthcare, we have recently been intensively drawing attention to the change in the approach to the patient. In the past, healthcare providers were the focus of the hierarchical system. Now, patient-centred care should form the core of the European healthcare system. The increasing use of various technologies in patient care and self-monitoring (e.g. wearable tools) generates large amounts of healthcare data. This is a patient-centric approach, requiring intensive collaboration among different healthcare providers (van der Eijk, Faber, Al Shamma, Munneke & Bloem, 2011; Martin, Ummenhofer, Manser & Spirig, 2010). This leads to the development of an informal social network among healthcare professionals who collaborate with each other while taking care of patients. This informal network is known as a patient-centric care network in healthcare literature (Uddin, 2016).

When the patient is empowered to take an active role and identify their health problem, they team up to solve the identified problem with the

necessary professional support. Such an approach is called problem-centred care (Pahor et al., 2014).

In health coaching in particular (More information in Chapter 5.6), nursing professionals focus on the patient's problem, addressed in close collaboration with the patient, rather than the patient themselves. When using digital technologies while providing self-management support to patients with chronic noncommunicable diseases (CNDs), professionals must maintain their focus on the patient instead of the digital technologies in question.

Student Assignment:

- In your opinion, can digital technology contribute to a more active role of the patient? If so, why?
- How can nurses empower patients' self-management through the use of digital technologies?
- In your opinion, what nursing approach do you suggest to provide self-care support to the patient? How should nurses change their approaches to patients to be more successful?

Integrated digital care

The global population is ageing rapidly, and an increasing number of older people are expected to have more CNDs and thus more complex health problems. This poses an unimaginable burden for healthcare systems around the world, which requires close cooperation of all stakeholders and an extremely fast, innovative and flexible creation of solutions for the imminent and unpredictable healthcare problems. By connecting and involving stakeholders in this field, lower costs and better treatment outcomes, patient involvement, empowerment, and experience can be achieved.

Successful integration in healthcare will not be achieved without the optimal inclusion of digital technologies (Goodwin, 2018). Digital health is defined as "a broad umbrella term encompassing eHealth (which includes mHealth), as well as emerging areas, such as the use of advanced computing sciences in 'big data,' genomics and artificial intelligence" (World Health Organization, 2019, p ix). Digital health and digital care are tools and services using ICTs on the field of prevention, diagnosis, treatment, monitoring and taking care of health and well-being. Digital care is the convergence of digital technologies with healthcare services.

Interventions in the field of digital health must be meaningfully integrated in the context of an individual country, directed by guidelines, standards or recommendations in the field of health services, digital interventions or their functionality, communication and software solutions. The successful implementation of interventions is based on the foundational layer (World Health Organization, 2019). In Figure 23 you can see the components contributing to the successful implementation of digital health.

HEALTH CONTENT	+	DIGITAL HEALTH INTERVENTIONS	+	DIGITAL APPLICATIONS
Information that is aligned with recommended health practices or validated health content		A discrete function of digital technology to achieve health sector objectives		ICT systems and communication channels that facilitate delivery of the digital interventions and health content

Foundational Layer: Ict and enabling environment
Leadership and governance

Strategy and investment	Services and applications	Legislation, policy and compliance	Workforce

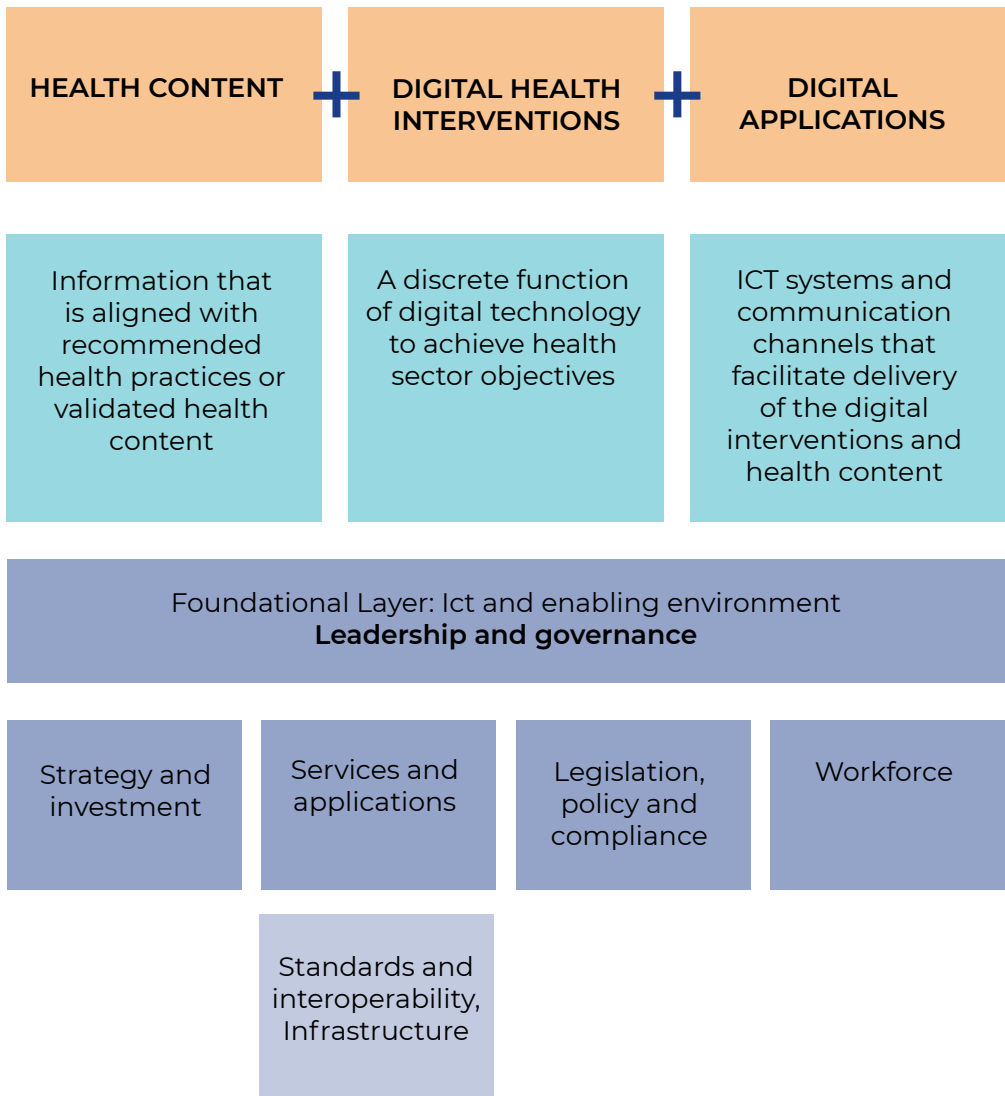Standards and interoperability, Infrastructure

FIGURE 23. Components of digital health (World Health Organization 2019)

The integration of healthcare interventions has different perspectives and expectations of healthcare system participants: from the process, patient or system. Nevertheless, integrated care should be centred on the needs of patients, their families and communities. Concerning the process perspective, "integration is a coherent set of methods and models on the funding, administrative, organizational, service delivery and clinical levels designed to create connectivity, alignment and collaboration within and

between the cure and care sectors" (WHO, 2016). Integration can also be virtual, which includes the creation of alliances, networks and contractual arrangements (Curry & Ham, 2012).

The integration of digital health/care to the healthcare system can occur at the micro, meso or macro level (Figure 24) (Curry & Ham, 2012).

Macro level
- Health systems policy (collaborative culture, information system support, guildlines etc.)

Meso level
- Health sevices (networks, stuctures, facilities)

Micro level
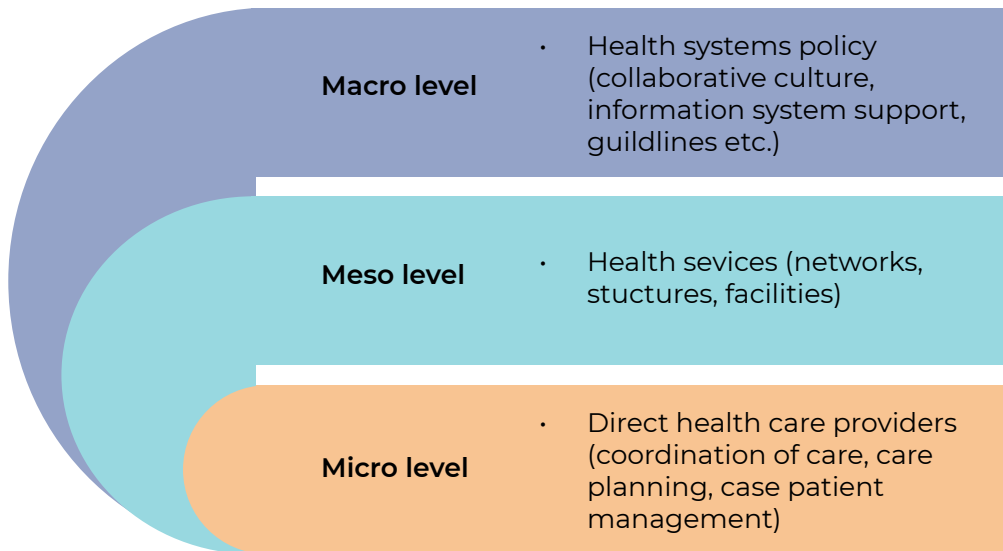- Direct health care providers (coordination of care, care planning, case patient management)

FIGURE 24. Levels of health care integration. (Curry & Ham, 2012, modified)

The most important and direct influence on patient healthcare is the integration of healthcare at the micro level. This includes horizontal (connecting different healthcare and other professionals) and vertical (connecting between different levels of the healthcare system) integration. A comprehensive integrative approach to care for the patient with CNDs also includes digital technologies.

Shared decision-making is an ethical imperative for healthcare professionals. The decision-making process includes healthcare team members, patients and their loved ones. They work together in partnership to make important decisions related to prevention activities, screening programmes, treatment, and self-management support. For several reasons, this is still not the norm in the healthcare system (Coulter & Collins, 2011; Légaré & Thompson-Leduc, 2014). The inclusion of shared decision-making

in healthcare delivery has a positive effect on the active involvement of the patient and thus on better self-management (Coulter & Collins, 2011). Shared decision-making is also part of the National Institute for Health and Care Excellence (NICE guidelines for the patient) (Allaby & Chrisp, 2019).

Another approach is collaborative decision-making, which places the patient and healthcare professional in proactive roles. They work intensively together to formulate the patient's healthcare plan. The expert acts as an informant, for example on different treatment options, and supports the patient in being proactive (O'Grady & Jadad, 2010; Politi & Street, 2011). Collaborative decision-making focuses more on building shared knowledge about the overall context of the patient's health and life rather than on individual service providers, the medical aspects of care, and the management of disease and related decisions (O'Grady & Jadad, 2010). Collaborative decision-making also includes an agreement on working together to bridge any differences in perceptions of the issue and disagreement about the plan (Goldsmith & Standing, 2017). The healthcare provider acts as the patient's coach when making decisions related to health and well-being. For successful collaborative decision-making, the healthcare professional and the patient share data in order to ensure the transparency of the decisions. Mobile or other digital technology can support this type of decision-making by providing real-time data sharing (Hsu et al., 2016).

In the DigiNurse Model, we consider digital care as a form of care provided from a distance using any kind of technology. It requires a communication method. Each of these communication methods (e.g. telephone, email, SMS) has its characteristics and guidelines for appropriate use. In DigiNurse, students will learn how to apply these methods for professional use and integrate these digital interactions into the health coaching process and personalised care plan. DigiNurse combines face-to-face care with digital care and promotes a blended approach.

Student Assignment:

- As a future nurse, how can you contribute to the integration of digital health services in your work environment?
- Explore what kind of digital health interventions are available to patients with a particular CND (e.g. for patients with diabetes, depression, complex wounds, dementia) in our environment.
- How to guide the choice of digital technologies and adapt to the needs of the patient?
- What are the roles of nurses in integration and providing integrated digital health interventions? Which skills should they acquire to work successfully in this field?

Health digitalisation strategy

Digital technologies are part of our lives and shaping the present and future of the healthcare system. In this dynamic and innovative period, the nurses should be aware of their important role in the development and implementation of digital care to patients and their significant others. As per the recommendations of world institutions, the World Health Organization and the European Union, strategies in the field of digital health are currently being developed at the national level (WHO, 2019; European Commission, 2018).

Student Assignment

- Find out how the global strategy promotes the appropriate use of digital technologies.
- Go to the Internet and find the national strategy of your country related to digital health. Examine the role of nurses in it. In your opinion, what could be improved? How to achieve this?
- Find out how your national digital health strategies define patient self-management support.
- Explore other national strategies and compare them to your national strategy.
- What are the strategic objectives of digital health at the global, regional and national levels? You can find answers to those questions using the following link: https://www.who.int/docs/default-source/documents/gs4dhdaa2a9f352b0445bafbc79ca799dce4d.pdf

Recommendations

The recommendations for discussions topics related to digital care in nursing education are listed in Figure 25.

Digital technologies - Integration

- Appropriate and optimal number of digital tools
- User friendly and safe digital tools
- Patient support in use of digital technology

Personaliza-tion of Digital Health Care

- Plan to improve digital health literacy and motivation to use digital technology to patients, nurses and significant others
- Personalization based on individual abilities and needs
- Patient involvement in research and development of digital health technologies

Nurse - Patient Relationship

- Implementation of evidence-based approaches and interventions
- Focus from a healthcare provider or digital technology to a holistic approach
- Empowerment of an active role of patient, significant others and communities
- Professional co-operation with patients and interprofessional teams

Environment

- Assessment of patients' physical environment (digital tools, Internet access)
- Socio-cultural influence on the perception of digital solution and health

Innovation in Digital Health Care

- Creative mindset in digital health
- Participation in assessment of development needs in digital health care
- Participation in preparations and implementations of national digital health strategies
- Promotion to integrate digital technology and interventions to healthcare
- Development of digital health in collaboration with inventors and policymakers to maximize personalization

FIGURE 25. Recommended discussions topics in nursing education

Recommended reading

Global strategy on digital health 2020–2025 (WHO, 2020) https://www.who.int/docs/default-source/documents/gs4dhdaa2a9f352b0445bafbc-79ca799dce4d.pdf

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5.6 Coaching

Dorine Nevelsteen and Hilde Vandenhoudt

A fundamental part of a healthcare professional's work includes coaching, guiding, supporting and empowering a patient to take responsibility for their own health (Rotheram-Borus, Ingram, Swendeman & Lee, 2012). In order to take responsibility for one's own health, the patient needs to be able to solve problems, make decisions, utilise resources and make action plans related to their health as well as co-operate with health professionals (Lorig & Halstad, 2003). These interventions can be applied to health prevention strategies, promotion interventions, acute care and, most often, chronic illness care (Nagelkerk, Reick & Meengs, 2006).

One of the aforementioned skills that healthcare providers need to master is coaching. The process of coaching a person with a chronic condition includes building rapport, collaborative goal setting and a cyclic process of supporting the person's implementation and maintenance of lifestyle behaviour changes (Bodenheimer & Handley, 2009; Lorig, Ritter, Pifer, & Werner, 2013).

Coaching is mostly seen as a face-to-face process between the health professional and the patient. However, in the era of digitisation of health-care, digital coaching or supporting of self-management from a distance can be considered an inherent part of coaching. (Erbe, Eichert, Riper & Ebert, 2017; Rasing, Stikkelbroek & Bodden, 2019.) A combination of face-to-face and digital coaching is seen as a feasible and promising approach in patients with mental disorders (Olthuis, Watt, Bailey, Hayden, & Stewart, 2016), diabetes (Van Rhoon, Byrne, Morrissey, Murphy, & McSharry, 2020) and cardiovascular diseases (Beishuizen et al., 2016), but more research is needed to assess its effectiveness.

Digital technology methods (apps, programs, etc.) have emerged to assist changing one's lifestyle or supporting a healthy lifestyle. In the future, one cannot withhold these additional sources of support from patients who live with a chronic condition. Electronic data transmission, tele-screening (telemonitoring) and tele-control can contribute to the development of an integrated treatment model where patients are encouraged to actively participate in their own care process. In such a situation, patients become active partners in the management of their own condition, provided they

receive tailored support. (Gee, Greenwood, Paterniti, Ward, & Miller, 2015; Greenwood, Gee, Fatkin & Peeples, 2017.)

Recent developments in information and communication technologies can enable the transition from current nursing to integrated nursing. Healthcare institutions need to integrate the intelligent use of the afore-mentioned new technologies into their curriculum so that students learn to become all-round coaches (using digital and communication skills) to support the self-management of the patients.

Enabling students to practice their digital coaching skills means that they gain expertise in coaching and are familiar in using digital technology during the coaching conversations. It requires attention to coaching and to digital care in the nursing curriculum. An acquisition of basic skills in interpersonal communication and 21st century skills is assumed before one can focus on coaching skills. In times of patient-centred care, it's important that students learn to develop a trustful relationship with the patient, to create a safe environment for dialogue and to guide the patient to unlock their potential in coping with their health challenge. The way one looks at health determines to a large extent the path that the health professional walks with the patient. In the DigiNurse Model, we use the Positive Health concept based on salutogenesis.

Due to the digital component of the DigiNurse Model, health professionals should acquire the competence to provide coaching online using electronic data transmission, tele-screening and tele-control. The concept of digital coaching in healthcare is increasingly being used as a means to identify technology-based automatic interventions. However, it differs to some extent from the multimedia psychoeducational programmes or other health-related information that may be sent electronically to patients. (Strecher, 2009.) Furthermore, optimising resources is a key factor driving the healthcare industry. At present, online consulting can be quick, cheaper, more scalable and to a large extent customised. Properly implemented digital coaching can be beneficial to patients. Digital coaching is also referred to as e-coaching. Regrettably, an international consensus on the definition of e-coaching is lacking. Veen (2017) explains e-coaching as an "online communication system that provides medical assistance to a patient at home".

> Digital technology methods (apps, programs, etc.) have emerged to assist changing one's lifestyle or supporting a healthy lifestyle.

Coaching in Healthcare

The concept of coaching is well known in many professional sectors. No matter how coaching is applied, it is a method of unlocking an individual's potential and maximising their performance. Also, it is a form of learning. In coaching, the common goal is always to bring out the best in the coachee (the person being coached) so that they are able to deal with the present challenge. The role of the coach is to support and promote the learning and development of the coachee. The coach does not provide ready-made answers. They are not a therapist. Coaching is not just a method but a way to treat people fairly, a way to think and to be. (Whitmore, 1996.)

In healthcare, coaching is based on health promotion and mutual trust. The coach motivates the coachee to assess and enhance their strengths and to achieve personal well-being goals. It is important that the coach is present, actively listening and asking questions that helps the coachee become more aware of their own ways of thinking. The coach will help the coachee understand their own preconceptions and limiting beliefs and encourage them to develop new patterns in thinking and coping.

Unlocking a person's potential is the skill at the centre of the DigiNurse Model. Students learn how to become a skilled companion and a supporter for their patient. This requires an important mind shift. One needs to release the role of a health education expert and embrace the fact that the coachee knows what they want and need. The focus needs to shift from thinking for the patient and coming up with solutions to helping the patient think for themselves. The aim of coaching in healthcare is improving and supporting the quality of life, as defined by the patients them-

selves, by unlocking a person's potential. The concept of coaching has a lot in common with the concept of self-management.

Basic values of the coaching process

The quality of the relationship is an important factor in coaching. Values such as trust, safety and authenticity are key components in building up a healthy relationship. The one who is being coached needs to feel secure, valued, understood and validated. A good coaching process needs to foster a belief in the patient that they are learning. (Withmore, 1996; Bouckaert & Broeckaert, 2009; Clement, 2017.)

Trust is a belief in which one relies with confidence on someone or something. Trust being bound to time and space assumes that one will receive good from another person. It is a form of willingness to engage oneself in a relationship with an acceptance of vulnerability. Nurses' ethical competencies, e.g. trustworthiness, confidentiality, commitment to providing the best, wholistic care, authenticity, sensitivity and humility, are important in developing trust. Also, awareness of patients' needs and understanding of patients' suffering are meaningful components in a trustworthy relationship. In addition, respectfully accepting patients' cultures, lifestyles and decisions without prejudgment and providing reassurance and encouragement are significant characteristics in a trustful relationship. (Dinç & Gastmans, 2013.)

Coaching attitude: how to become the skilled companion

Coaching a patient means entering respectfully into an authentic connection. During a coaching conversation the patient will be brought in motion. Something essential happens regarding the way the patient thinks about their situation. This affects the patient's feelings and consequently the actions of the coachee. Coaching a patient means that the awareness of thoughts, feelings and behaviour grows. In order to be able to do this in safe circumstances and in confidence, it is essential that the coach receives a mandate from the patient. A mandate means that the roles and cooperation are clear for both partners. (Withmore, 1996; Clement, 2017.)

In addition to the mandate with the patient, the coach's self-reflection is an important starting point of a coaching session. The coach must assess their own feelings before the session (Figure 26). The coach must also assure the coachee that the coaching conversation is not harmful by any means.

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Are you in the right mood to start a coaching conversation?

Can you be completely open and engaged in the conversation?

Do you have the skills to build a good rapport with the patient?

Do you have the necessary resources to take a coaching role?

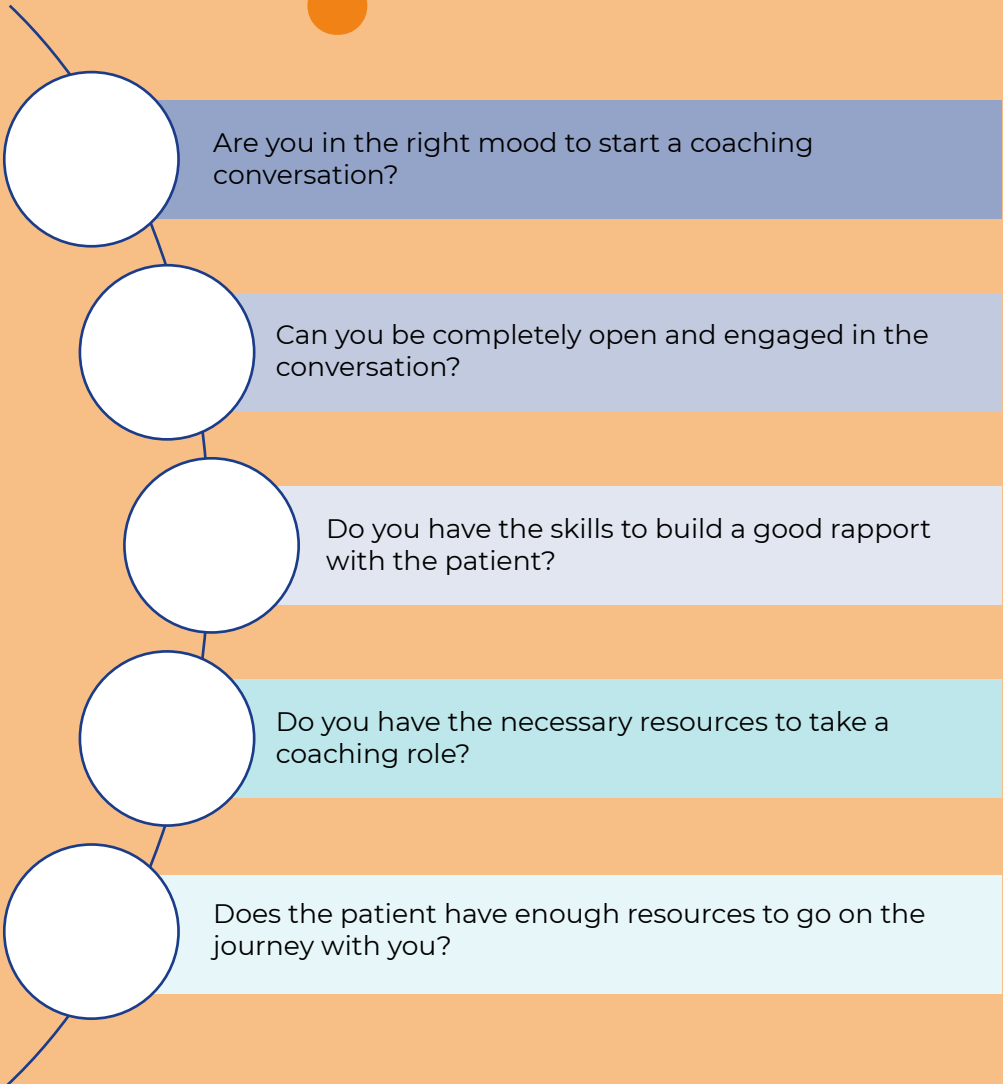Does the patient have enough resources to go on the journey with you?

FIGURE 26. Questions for the coach before starting a coaching session (Bouckaert & Broeckaert, 2009, modified)

A basic requirement is to start each conversation with an open mind. To act as a skilled companion, one needs to be present and give their full attention to the other person in an authentic way. A basic condition for a coach is to focus on the positive rather than on the negative and use positive language. Coaching a conversation with a patient goes much further than applying a specific conversation method. One needs to be confident in one's own communication skills and be able to switch easily between leading a conversation and following a conversation, just like dance partners involved in a passionate dance, playing a game of leading and following. (Bouckaert & Broeckaert, 2009.)

A coach will help the patient release some of their old patterns and install new ones. To do this, you need to give him room and time to fail. Learning happens through failure. One can consider the word FAIL as First Attempt In Learning. Coaching requires an important switch in the health professional's mindset. Health professionals are used to working with the care need, in a hands-on, solution-focused and advisory way. Instead of acting for the patient, a coach is giving the patient's personal potential a boost by strengthening their ability to grow and develop. The patient does the work themselves. The coach works with the content that the patient brings into the process. (Withmore, 1996; Bouckaert & Broeckaert, 2009; Clement, 2019.)

Every patient has expertise in the area of their own life, including living with one or more chronic diseases. It is important to recognise this expertise. Only in this way can the health professional become an equal partner in the care of the patient. If the patient makes choices that are different from the ones the health professional would make, it can sometimes be a challenge to respect the choice of the patient. This can lead to dilemmas. (Withmore, 1996; Clement, 2017; Duprez, Beeckman, Verhaeghe, & Van Hecke, 2017.)

Building rapport

Building rapport is a technique to become more conscious of the elements that build a connection with the other person. Building rapport means building a quality relationship. Rapport can be understood as a good contact, a good bond, a good connection. A good rapport is an absolute prerequisite for successful coaching. By nature, everyone builds rapport. If there is a feeling of trust and safety from the first gut feeling, the natural ability to build rapport will unconsciously be applied. (Bouckaert & Broeckaert, 2009)

When there is rapport, there is an involvement of both parties. There is relational credit so that one is willing to be led by the other. Attention is strongly focused on each other and both parties can work together. Working on a rapport is a continuous process. The quality of the relation is constantly changing. The conscious process of building up a rapport is called tuning or matching. It's all about listening before you speak, connecting instead of trying to influence and taking a moment to be more authentic. (Bouckaert & Broeckaert, 2009.)

Throughout the entire process the coach remains themself and looks at the possibilities to tune in. You can tune in to environmental factors or behaviour. To tune in to behaviour, one can use the BAGEL model (Figure 27). By making use of these different elements, by copying them where possible, you can create a deeper connection with the conversation partner (Dilts, 1994).
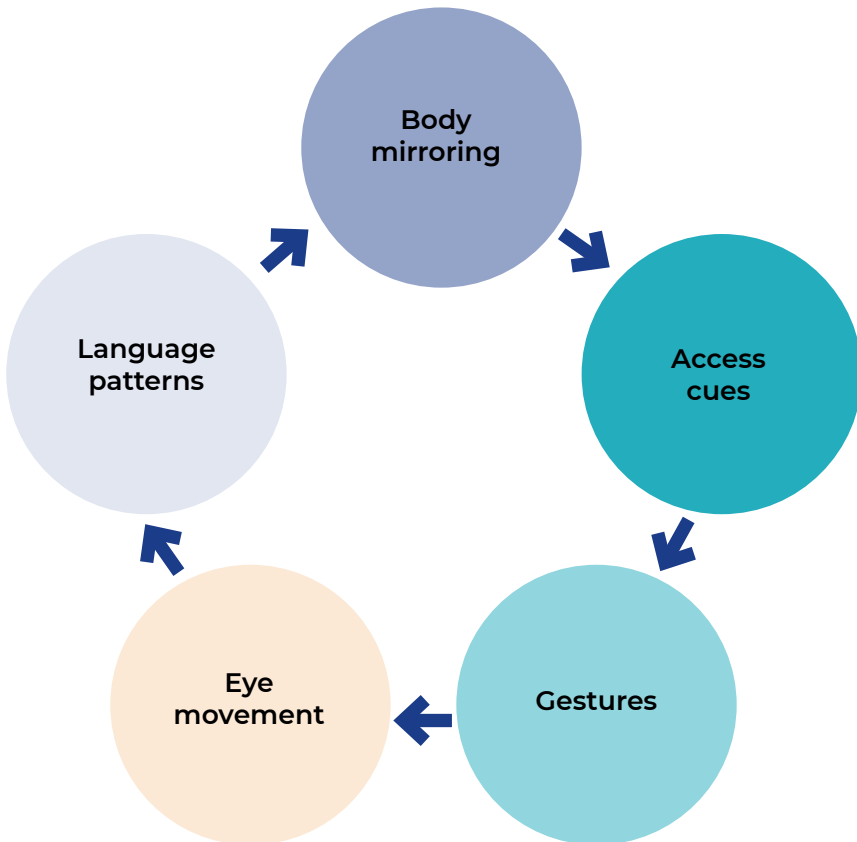

FIGURE 27. The BAGEL model to tune in to behaviour during the coaching session (Dilts, 1994, modified)

Also, you can train yourself in observing the mental-emotional processes of the other. Insight into the thinking strategies, values, motives and goals, the identity and role models and the way in which the person wants to contribute to the greater whole provides information to deepen the connection with the patient.

Keep the outcome of every question and of every step in the process in mind! What's the intention? What is certainly not the purpose? Instead of using 'why-questions,' try to formulate the question as 'What makes that …´

As Dixon once said: "Probably my best quality as a coach is that I ask a lot of challenging questions and let the person come up with the answer".

Be aware of your resources and those of the patient. Can and do you want to provide genuine care, are you committed to the patient? Which tools do you or the patient bring into the conversation? Elements to take into account are e.g. the level of health literacy of the patient (More information in Chapter 5.3), your personality, your knowledge, your strength, the personality of the patient, their knowledge and their strengths.

Developing Coaching Skills

Coaching a patient goes much further than applying a conversation method. Therefore, one needs to develop coaching skills including exploring, appreciating, reinforcing in a positive way, challenging the other, and inspiring. Also, giving space, using humour and creating a relaxed atmosphere are important coaching skills. In Figure 28 the content of each coaching skill is presented in a detailed way and gives advice on developing the assumed skills.

"Probably my best quality as a coach is that I ask a lot of challenging questions and let the person come up with the answer".

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EXPLORING	• Pay full attention. • Explore what it is all about. • Be curious • Ask questions, listen actively, look for possibilities, expectations and wishes. • Ask exploratory questions, reformulate and summarize • Give and provoke emotional responses.
APPRECIAT-ING POSITIVE REINFORCE-MENT	• Built a supportive learning climate • Start by not being hindered by your limiting beliefs • Go for the full appreciation and empowerment. • Use positive language. • Don't leave out anc chance to compliment the other. • Reinforce everything that is going well. • Mention every improvement in an appreciative way
CONSTRUC-TIVE CON-FRONTATION	• Deal constructively with the concerns you have about behavior, statements, ideas, opinions that the coachee shows • Master the skill to give confrontational feedback in an appreciative way • Open up the possibility for the patient to deal with elements that were otherwise concealed
CHALLENGING	• Challenge the patient in tackling issues at hand • Stimulate patients to take the lead and to enhance his responsibility • Challenge the patient to get out of is comfort zone by developing new strengths
INSPIRING	• Inspire the patient to show creativity • Inspire the patient to discover a new pattern, a new challenge, a new perspective • Inspire the patient to keep looking at the future and not to get carried away by the problem.
GIVING SPACE TO FEELINGS AND EMO-TIONS	• Leave things as they are so that they can change at their own pace • Allow feelings to happen, to let them be we what they are • Explore the resistance. Investigate what lies beneath it
RELAXING	• Feel relaxed even when things are difficult • Show a form of trust or grip so that the patient feels supported • Practice the ability to look in control, breathe relaxed and allow humor and fun

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FIGURE 28. Advice to develop assumed coaching skills (Clement, 2017, modified)

Achieving the assumed coaching skills requires knowledge and practice. During the nursing students' practice session some advice and tips will be useful (Figure 29). One may have to concentrate on forms of questions, their own attitudes and communication skills. Also, the mindset of accompanying a patient to a trip might be a new approach.

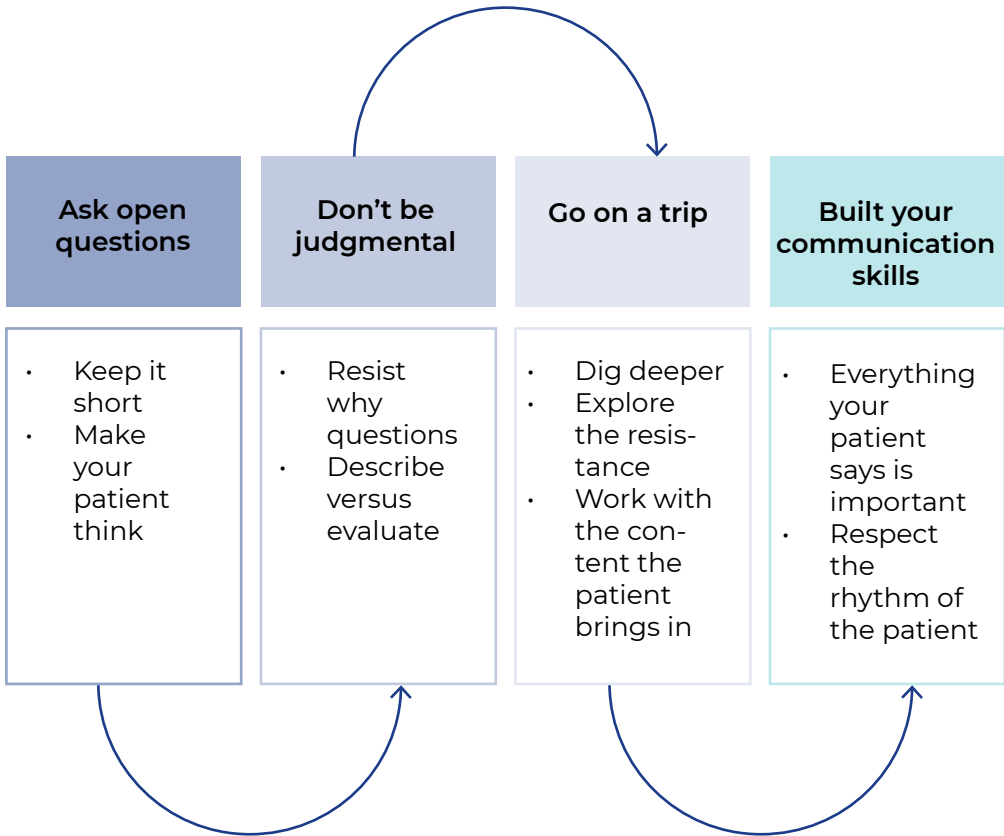| Ask open questions	Don't be judgmental	Go on a trip	Built your communication skills
• Keep it short • Make your patient think	• Resist why questions • Describe versus evaluate	• Dig deeper • Explore the resistance • Work with the content the patient brings in	• Everything your patient says is important • Respect the rhythm of the patient

FIGURE 29. Coaching tips.

The theoretical understanding of coaching and achieved coaching skills can be combined with coaching models. The models will help with framing and structuring the coaching session, where the skills are applied. In the DigiNurse Model three coaching models were combined with ethical and digital considerations to generate an educational model for nursing students. These coaching models are introduced in Chapter 5.7.

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5.7 Coaching Models

Dorine Nevelsteen

In the DigiNurse Model every coaching conversation starts with examining the patient's views on their own health. This exploration is done based upon the spiderweb of positive health. The patient indicates the area of their health in which they wish to make a change. To achieve this, the patient and the health professional work together. The professional uses a coaching mode which they feel comfortable with.

In the DigiNurse Model we propose to use one of the following three models for coaching: GROW, 5 A's and Motivational interview models. In this chapter the mentioned three models are discussed in general. Also, some tools for using each model and recommended reading materials will be presented.

Grow Model

The GROW model (Withmore, 1996) is the most widely used coaching model. The GROW coaching model is a flexible model that uses the following four phases: Goal, Reality, Options and Will. It is desirable to go through each of the four stages, but you need to adapt the process to the needs of the patient. In other words, there is not one fix for all. The model was originally developed in the 1980s by business coaches Alexander, Fine and Whitmore. (Withmore, 1996). It comprises 4 phases: Goal, Reality, Options and Will (Figure 30), offering a framework to a coach and helping to guide interaction. It is desirable to go through each of the four phases. The conversation can start at any of the 4 phases depending on the need of the patient. However, it is important to realise that all phases can be discussed at any time in a cyclical way.

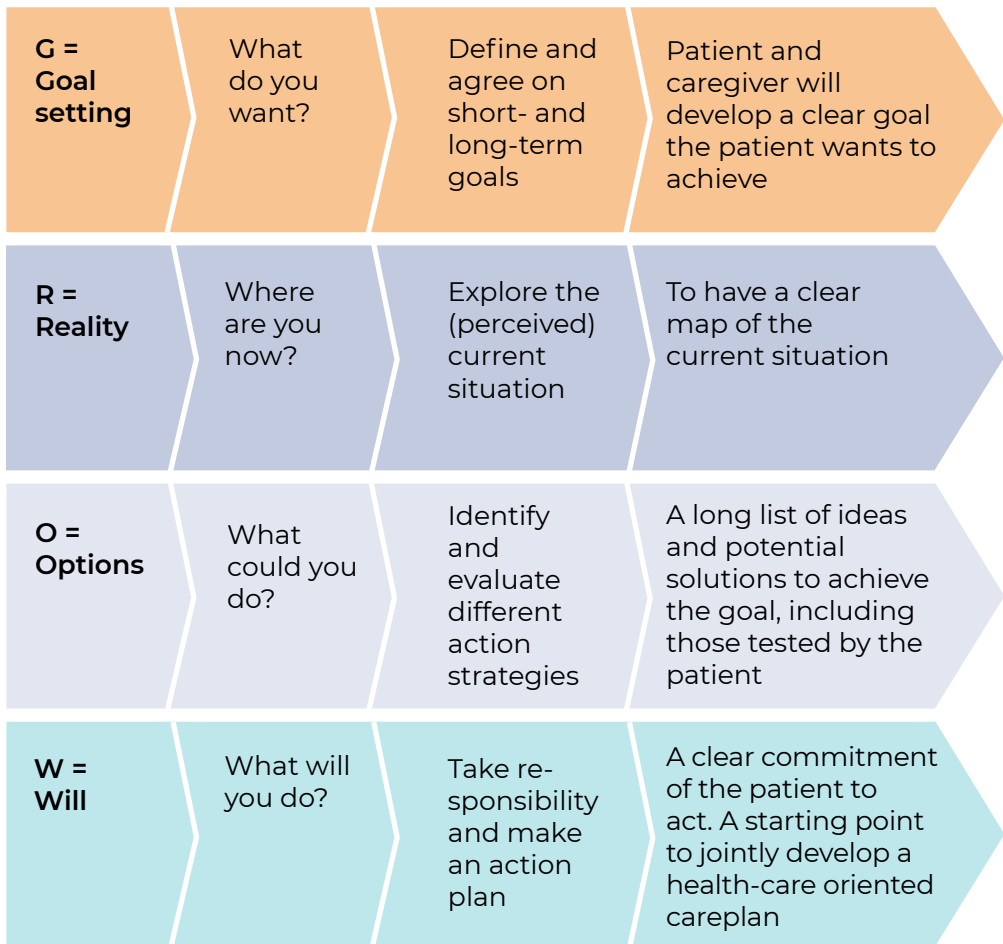| G = Goal setting	What do you want?	Define and agree on short- and long-term goals	Patient and caregiver will develop a clear goal the patient wants to achieve
R = Reality	Where are you now?	Explore the (perceived) current situation	To have a clear map of the current situation
O = Options	What could you do?	Identify and evaluate different action strategies	A long list of ideas and potential solutions to achieve the goal, including those tested by the patient
W = Will	What will you do?	Take re-sponsibility and make an action plan	A clear commitment of the patient to act. A starting point to jointly develop a health-care oriented careplan

FIGURE 30. The 4 steps of the Grow Model. The goals and outcomes of the steps (Clement, 2017, modified)

Communication skills are a fundamental part of using the Grow model. A skillful coach has an ability to let go of one's own framework and avoid being biased. The coach can tolerate the situation and finds no need to fill in for the coachee. Using in-depth questions, triggering the discussion by suitable questions and the ability to stay focused on the agreed outcome are the necessary coach's skills in each phase of the Grow model. Open questions have been developed for each stage to help the coach support the coachee.

Goal

The main content in the Goal phase is to find out what the patient wants to achieve. In this phase a coach looks for short- or long-term goals. Guide your patients to discuss their goals by asking open questions (Figure 31). Ask the patients which health-related goal they define for themselves. What kind of care do they need? How can patients be helped meaningfully in their process.

A coach needs to possess good communication skills and distance themselves from their own thoughts, beliefs and frame of references to succeed in in-depth questions. The coach triggers the patient by asking the right questions and by avoiding filling in for the patient. The goal defined by the patient is an ultimate motivation factor. (Withmore, 1996.)

GOAL

- What problem are you trying to resolve?
- What could we work on that would make a big difference?
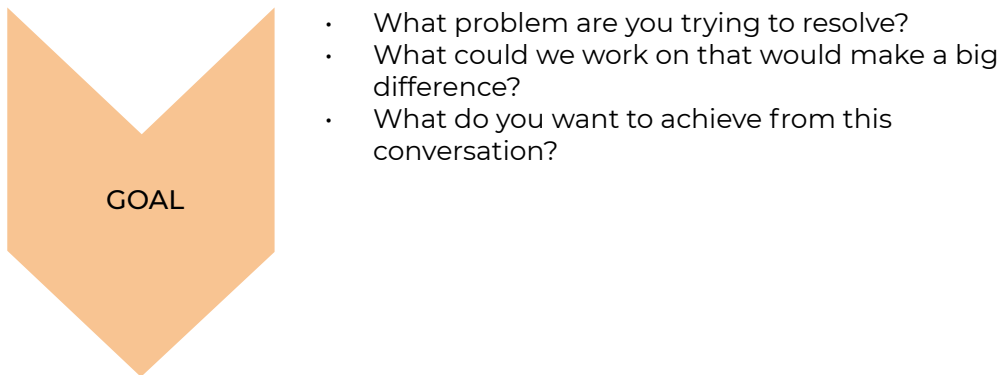- What do you want to achieve from this conversation?

FIGURE 31. Questions in the Goal phase (Clement, 2017, modified)

At the Reality phase (Figure 32), the focus is on the patient's present health. A coach should be able to screen the reality by thoroughly assessing the current health situation and its impact on the patient. In this phase, the aim is to explore the reality of patients' health topics and encourage patients to express their thoughts. By using the in-depth questions, a coach will obtain a comprehensive picture of the challenges experienced by patients in their everyday lives. Furthermore, this discussion will assess the barriers restricting the change of patients' behaviour. (Clement, 2017.)

REALITY
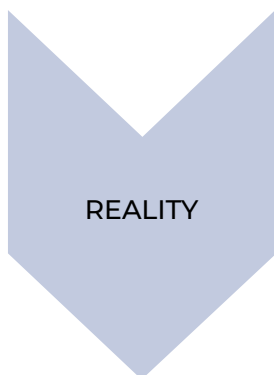
- So, what is happening now?
- What have you done about it so far?
- How is this impacting you, others?
- How does this make you feel?
- If things don't change, what is likely to happen?
- What are the key barriers to improving this situation?

FIGURE 32. Questions in the Reality phase (Clement, 2017, modified)

Options

In the Options phase (Figure 33), the main issue is to explore together what the patient could do to achieve the agreed goal. This can include discussions regarding the patient's various opportunities, potential solutions, alternative strategies, ways of changing behavioural patterns or other actions. In the Options phase the patients are challenged to recognise and reflect upon their behaviour and the available options. The potential change of perspective and patients' individual preferences should remain the focus. Finally, the agreed goal will be refined. (Clement, 2017.)

OPTIONS
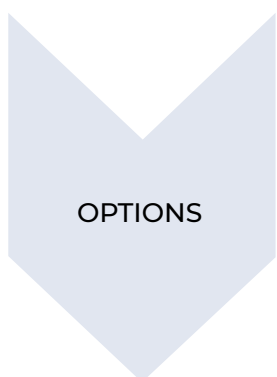
- What would the ideal outcome look like?
- What difference would this make?
- What ideas do you have to achieve this? What else could you try?
- Who else could give you another perspective?
- What actions have you taken in similar situations?
- What are the pros/cons of these options? What option are you most drawn to?
- If the preferred option isn't possible, what would be the next best thing?

FIGURE 33. Questions in the Options phase (Clement, 2017, modified)

Will

In the Will phase (Figure 34) of the Grow Model, a tailored action plan will be created together with a coach and a patient. The patient takes responsibility. The action plan is based on collaborative goal setting and shared decision-making. The shared decision-making ensures the minimal steps that the patient can commit to the plan in order to overcome obstacles and provide the patient with the necessary support. At this phase the coaching process has achieved the point of a concrete next step. (Clement, 2017.)

Clear communication is required to establish a distinct description of the goal. The 'SMART' method (Specific, Measurable, Attainable, Realistic, Timely) for formulating the goal is a useful aid (Revello & Fields, 2015). It is important that the goals are well-formulated. The goal should be described in positive terms, specifically linked to a context and achievable under own management. Also, they should be ecologically sustainable and verifiable.

- What do you think is the next step?
- What is the smallest thing you could do to move forward?
- What are you going to do? When?
- What obstacles might you face?
- How can you overcome the obstacles?
- Who needs to know?
- What support might you need?
- What is the best way for us to follow up on this?

FIGURE 34. Questions in the Will phase (Clement, 2017, modified)

Motivation

In each step of the process, it's important to be aware of the motivation of the patient. One can work with the motivation scale. It is not enough to just accept a positive response from the patient when asking them about motivation. Try to dig deeper. By using the motivation scale, one can get a better view on the motivation level of the patient. The motivation scale is numbered from 0 to 10. Invite the patient to convert their motivation to

take a next step into a number from 0 to 10, where 0 is a lack of motivation and 10 represents the highest degree of motivation.

What does the patient need to increase their motivation by one point? This information will help you fine-tune the formulated goal. When we work with the motivation of the patient, we also gain more insight into the level of resistance that is present. Join the resistance. Explore the resistance. What is the meaning of the resistance? Exploring resistance opens up a treasure room of limiting beliefs. This can help you as a coach to better understand why the process is difficult, what is holding the patient back and what is preventing progress.

Motivational interviewing model

Motivational interviewing (MI) is a counseling approach developed partly by Miller and Rollnick (2013). It is a directive, client-centred counseling style for eliciting behaviour change by helping clients to explore and resolve ambivalence. Compared to non-directive counseling, it is more focused and goal-directed. It departs from traditional Rogerian client-centred therapy by using a direction in which therapists attempt to influence clients to consider making changes, rather than engaging in non-directive therapeutic exploration. The examination and resolution of ambivalence is a central purpose, and the counselor is intentionally directive in pursuing this goal. MI is most centrally defined not by technique but by its spirit as a facilitative style for interpersonal relationship. (Miller & Rollnick, 2013.)

MI positively affects both patients and healthcare providers. Patients tend to become more motivated to engage in new and healthy behaviour due to their awareness of the responsibility of their health conditions. Consequently, this results in better treatment outcomes and higher disease prevention. The application of MI contributes to health professionals' greater success, satisfaction, self-confidence and a sense of self-efficacy. For MI, the OARS tool (Open questions, Affirmation, Reflective listening and Summarising) is used. Questions are aimed at making the patient aware and responsible for the change. Affirmation is a way to direct patients' attention from difficulties to goals. Reflective listening and summarising require active listening skills from the person conducting MI. Through them the most positive content is provided to patients to encourage them to accept the transformation process and change. The inner motivation and commitment of the patient has to be present in order to successfully attain the goal. (Szczekala, Wiktor, Kanadys, & Wiktor, 2018.)

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While there are as many variations in technique as there are clinical encounters, the spirit of the method is more enduring and can be characterised in a few key points:

1. The motivation to change is elicited from the client and is not imposed from outside forces.
2. It is the client's task, not the counselor's, to articulate and resolve the client's ambivalence.
3. Direct persuasion is not an effective method for resolving ambivalence.
4. The counseling style is generally quiet and elicits information from the client.
5. The counselor is directive, in that they help the client examine and resolve ambivalence.
6. Readiness to change is not a trait of the client, but a fluctuating result of interpersonal interaction.
7. The therapeutic relationship resembles a partnership or companionship.

Motivational conversation is often linked to the Prochaska and DiClemente Stages of the Behavioural Change Model (1992). Within the motivational conversation, six phases are distinguished. Health professionals need to recognise the phase applicable to the patient and guide and support them accordingly.

In the pre-contemplation phase, patients can't see the problem. They want to change the people around them instead of themselves. This is followed by the contemplation phase. The patients acknowledge the problems and make considerations to solve them. They may still struggle with understanding the problem and might not be ready to commit. In the next transitional phase, the focus shifts into finding a solution and looking at the future. Then the phase of preparation follows. The patient plans to act within the next month. There is still some ambivalence, but several small behavioural changes are initiated. Success can be promoted by forming a detailed plan of action. The phase of action follows. After this, it is necessary to consolidate the achievements attained during the action phase. In the phase of maintenance, neither the former problematic health behaviour nor its temptation or threat exist any longer. (Prochaska & DiClemente, 1992.)

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5 A's Model

The 5 A's model (Figure 35) reports on five key activities in the process of self-management support (Glasgow, Davis, Funnell & Beck, 2003): Assess, Advice, Agree, Assist, and Arrange. In the Assess phase, professionals explore patients' beliefs about living with the chronic condition and patients' motivation for managing their condition. In the Advice phase, tailored information is provided upon the patient's request, which is a precondition for informed decision-making. In the Agree phase, collaborative goals are set. In the Assist phase, patients are enabled to adapt their daily activities to the demands of the chronic condition. During the Arrange phase, follow-up care is organised. A partnership attitude is needed in each phase of the support process (Van Hooft, Dwarswaard, & Van Staa, 2015).
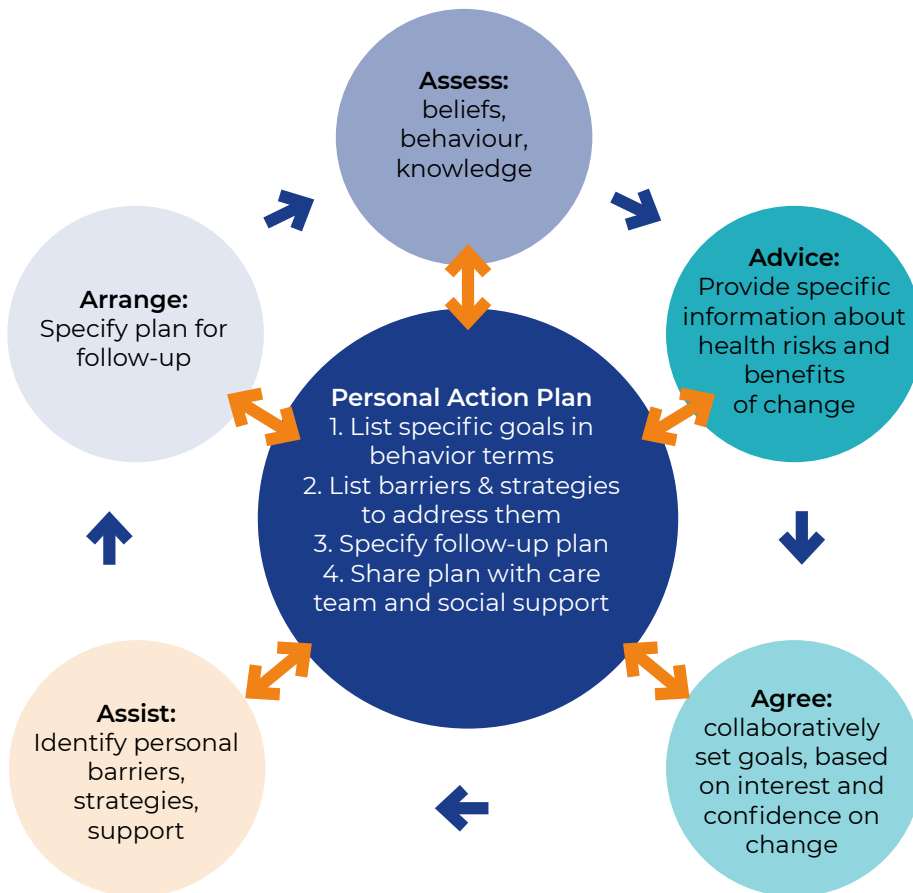

FIGURE 35. 5 A's model of self-management support (Glasgow, Davis, Funnell, & Beck, 2003, modified)

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Assessing

In the Assessing phase (Figure 36), the nurse examines the individual situation of the patient. They pay attention to the diversity, the experiential knowledge, the patient system and the role the patient wants to take on. The nurse takes the time and space to get to know the patient. (van Staa, Mies, & ter Maten-Speksnijder, 2018.)

ASSESSING

- Ask for permission to discuss about a consern
- Assess the expectations about living with the condition
- Ask about the experiences related to condition
- Assess the knowledge about the condition
- Ask about sharing of emotions
- Ask about the motivation to take care of his/her condition
- Ask about the commitment on the self-management
- Asses the patient's confidence about the self-care abilities
- Ask about abilities and preferences in care process
- Asses the core values influencing patient's perception of the condition

FIGURE 36. The guiding questions for discussions in the Assessing phase (van Staa, Mies, & ter Maten-Speksnijder, 2018, modified)

Advising

In the Advising phase (Figure 37), the nurse provides the patient with information and instructions based on professional knowledge. This will be possible if the patient is ready to receive it. The theme, which will be discussed, is how the patient can integrate their condition into everyday life, adapted to the individual situation. The different aspects of the information should match the preferences and needs of the patient. (van Staa, Mies, & ter Maten-Speksnijder, 2018.)

ADVISING

- What information the patient needs?
- Ask for permission to provide information and advice.
- Provide information and instruction e.g. about healthy lifestyle appropriate for the condition.
- Inform and instruct the patient about the treatment choises of the condition.
- Ask the patient to return the information you have given.
- Let the patient indicate which complaints need attention
- Assist the patient to formulate questions for conversations with other care providers.
- Involve the family by giving information and instructions.

FIGURE 37. The guiding topics for discussions in the Advising phase (van Staa, Mies, & ter Maten-Speksnijder, 2018, modified)

Agreeing

In the Agreeing phase (Figure 38), the nurse assists patients in formulating feasible goals and activities that fit the patients' situation. Together with a patient, the nurse records these agreements in the care plan. When the patient has enough knowledge about their condition and the nurse knows what is important for the patient, goals and agreements can be made together. (van Staa, Mies, & ter Maten-Speksnijder, 2018.)

AGREEING

- The nurse discusses with the patient about expected positive outcomes of achieved goals
- The goals are defined together with the patient
- The patient sets priorities when defining the goals.
- A plan of working towards the goals is done together
- The goals and agreements are recorded in the patient file.
- The nurse recognizes the uncertainty of the patient and helps on decision-making.

FIGURE 38. The guiding topics for discussions in the Agreeing phase (van Staa, Mies, & ter Maten-Speksnijder, 2018, modified)

Assisting

In the Assisting phase (Figure 39), the nurse coaches patients in learning the skills they need to master. The nurse takes the patient's situation into account and especially focuses on the comprehensive support and skills needed to fit the condition into the life of the patient.

ASSISTING

- Invites the patient to talk about the loss of health and the changes in his life.
- Strengthen the patient's confidence in his ability to fit the condition into his life.
- Assist the patient to monitor his own health and physical reactions.
- Encourage the patient to do daily tasks as independently as possible and to choose activities he can handle well
- Discusses with the patient how he can work in his daily life using self-management tools.
- Discuss with the patient to whom he is going to tell about his condition.
- Discuss about the possibilities/needs to receive daily support
- Support the relatives in dealing with the condition.

FIGURE 39. The guiding topics for discussions in the Assisting phase (van Staa, Mies, & ter Maten-Speksnijder, 2018, modified)

Arranging

In the Arranging phase (Figure 40), the necessary follow-up appointments are arranged and scheduled together with the patients, assuring the continuity of care. It is important to encourage patients to take control and be aware of the possibilities to contact the care team between the appointments. In addition, the continuity of care should include interdisciplinary services including the third sector, peer support and digital health services. All the arrangements should be based on the values of the patients.

ARRANGING

- Ask about suitable time and way for follow-ups
- Refer the patient to the appropriate care provider, agency, source of information
- Inform the other care providers and coordinates the care with them.
- Guide the patient from a distance using supporting tools such as eHealth.
- Offer the patient the possibility to contact in an accessible way in between appointments if his/her condition reguires.
- Examine together with the patient how the implementation of the care plan is progressing

FIGURE 40. The guiding topics for discussions in the Arranging phase (van Staa, Mies, & ter Maten-Speksnijder, 2018, modified)

As explained earlier, there is a lot of overlap between coaching in health-care and self-management support. The goal is to unlock a patient's potential. Even in situations where we want the patients to change their behaviour, the goal is to empower them.

A simple model for starting coaching is the Grow model. Another model, which is very often used in self-management support of the patient, is the 5 A's model. In addition, the method of motivational interviewing is widely used for behavioural change. In the DigiNurse Model the aim is to unlock the potential of the patients to reach their health goals. We suggest choosing one of the aforementioned three coaching models.

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5.8 Technology and Data Care

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One of the sections of the DigiNurse Model is Technology and Data Care, which is illustrated as one of the wheels in the DigiNurse coach (Picture 1). Digital health technologies can enhance the self-care and self-management of patients with chronic illnesses (Lupton, 2013). Therefore, self-management technologies must fit the users' preferences (Anderson, Burford, & Emmerton, 2016), to improve the patients' clinical outcomes (Ciere et al., 2019).

This section examined the integration of technology in the self-management of chronic diseases. The focus is on conceptual models explaining user acceptance and other factors that influence the integration of technology in this context. Additionally, some relevant issues concerning ethical aspects and data protection will be addressed.

Integrating technology in the self-management of chronic diseases

Digital technologies used in health are becoming a valuable resource for providing effective healthcare and addresssing health needs (Agnihothri, Cui, Delasay & Rajan, 2018; WHO, 2018).

In 2001, Eysenbach defined eHealth as: "an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and

> Digital health technologies can enhance the self-care and self-management of patients with chronic illnesses (Lupton, 2013).

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related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology" (Eysenbach, 2001).

Within the scope of eHealth, it is possible to describe a component referred to as 'mobile health' (mHealth), which consists of a "medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices" (WHO Global Observatory for eHealth, 2011). A list of the twelve most common mHealth and ICT applications are (Labrique et al 2013):

1. Client education & behavior change communication (BCC)
2. Sensors & point-of-care diagnostics
3. Registries / vital events tracking
4. Data collection and reporting
5. Electronic health records
6. Electronic decision support
   Information, protocols, algorithms, checklists
7. Provider-to-provider communication
8. User groups, consultation
   Provider workplannig & scheduling
9. Provider training & education
10. Human resource management
11. Supply chain management
12. Financial transactions & incentives

mHealth interventions have been developed to improve healthy habits or disease management, for conditions such as chronic illnesses (Free et al., 2013). In fact, the World Health Organization's (WHO, 2013) action plan encourages the Member States to empower people with chronic diseases to promote early detection and better management of conditions and to provide tools for self-care and self-management, including ones available through digital, and information and communication technologies (ICTs).

Such solutions are not relatively new to the nursing profession. In fact, over the last three decades, a growing interest in this area has led to the development of several studies focused on ICT use in nursing care (Huang & Hwang, 2018). Evidence suggests that the integration of ICTs in nursing practice increases care efficiency, facilitates the implementation of evidence-based practice, and improves communication channels with other health professionals and patients (Ahmad, Musallam, & Habeeb Allah 2018; Christiansen, Fagerström, & Nilsson 2017; Honey & Wright, 2018; Koivunen & Saranto 2017).

Moreover, several studies have explored the effectiveness and impact of digital programs and interventions promoting self-management as well as mHealth applications in the prevention or management of several chronic conditions (Anderson et al., 2016; Banerjee, Ramanujan & Agnihothri 2016; Kumar, Khunger, Gupta & Garg, 2015; Sweet et al. 2017; Waki et al., 2014).

Acceptance of the technology

The use of technologies requires for them to be accepted by stakeholders (citizens and health professionals), optimizing their potential and ensuring that they do not interfere with adherence to and compliance with the therapeutic plan prepared for the patient. Decision-makers need to recognize the factors that influence the user's decision to use a particular system, so that they can take the related factors into account during the development of the technology and its implementation.

Many models and frameworks have been developed to explain user adoption of new technologies, including factors that can affect user acceptance (Parreira et al., 2019; Parreira, Proença, Mónico & Sousa, 2018). In this context, more than one theoretical approach is necessary for forming a complete understanding of the topic, but these are nonetheless usually studied separately (Taherdoost, 2018).

The DiGiNurse Model is based on one of the most widely referenced models in the literature – the Technology Acceptance Model (TAM) – as well as on the core principles of the Health Information Technology Acceptance Model (HITAM), the Theory of Planned Behavior (TPB), the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Cognitive Walkthrough Method (CWM).

The TAM, proposed by Davis, Bagozzi, and Warshaw (1989), is the one of the most frequently used models to evaluate the acceptance of the technology by potential users (Chang, 2015), and focuses on two particular dimensions, the perceived usefulness (PU) and the perceived ease of use (PEU) (Davis, Bagozzi, & Warshaw, 1989). In other words, the TAM's core principles suggest that a patient's intent to use (acceptance of technology) and use behaviour (actual use) of technology is predicted by his or her perceptions of the usefulness of a given technology (benefits gained from using the technology) and ease of use (Portz et al., 2019). Therefore, nurses must be aware that such perceptions of usefulness and ease of use are mediated by external variables, including individual differences, age, system characteristics, social influence, and facilitating conditions (Portz et al., 2019).

The Health Information Technology Acceptance Model (HITAM), developed by Kim & Park (2012), is an extension of TAM which explores the behavioural intention of the consumers of several health technologies. According to this model, there are three domains or zones that affect health consumers' attitudes and behavioural intention through a perceived threat, PU and PEU mediators (Kim & Park, 2012).
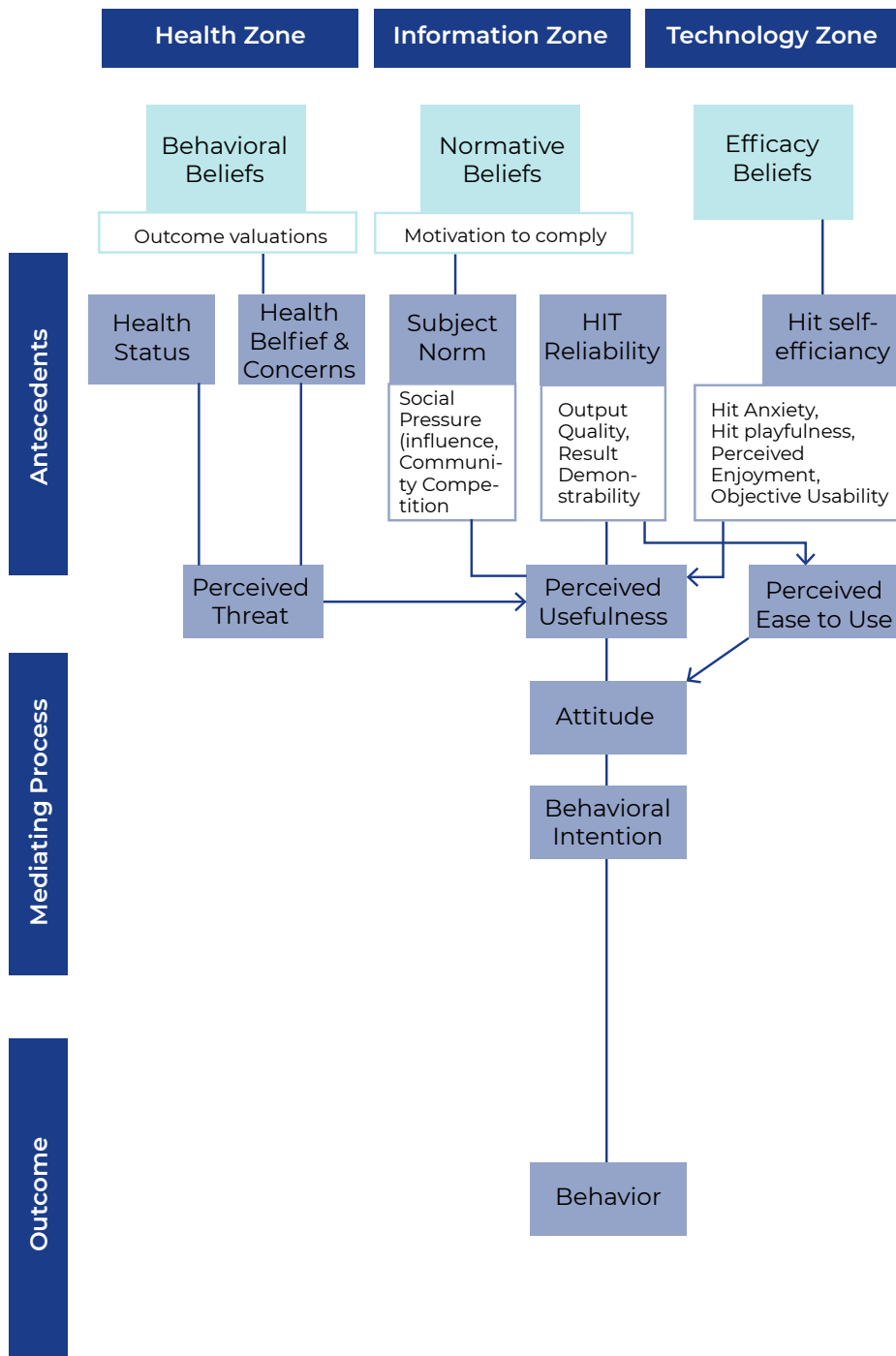
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Health Zone	Information Zone	Technology Zone

Behavioral Beliefs

Outcome valuations

Normative Beliefs

Motivation to comply

Efficacy Beliefs

Antecedents

Health Status

Health Belfief & Concerns

Subject Norm

HIT Reliability

Hit self-efficiancy

Social Pressure (influence, Communi-ty Compe-tition

Output Quality, Result Demon-strability

Hit Anxiety, Hit playfulness, Perceived Enjoyment, Objective Usability

Perceived Threat

Perceived Usefulness

Perceived Ease to Use

Mediating Process

Attitude

Behavioral Intention

Outcome

Behavior

FIGURE 41. The Health Information Technology Acceptance Model (HITAM) (Kim & Park 2012).

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In relation to the Theory of Planned Behaviour (TPB), Taherdoost (2018) highlights that the patients' perceived behaviour control emerges as a new explanatory variable that is determined by the availability of resources, opportunities and skills, as well as the perceived significance of these resources, opportunities and skills to achieve outcomes (e.g., health-related outcomes). However, perceived behaviour control is not under the individual's voluntary control, resulting in realistic limitations that were not previously addressed. Perceived behaviour control has a direct effect on actual behaviour as well as an indirect effect through behavioural intentions (White et al., 2015).

A practical example related to the use of a new technological device is presented in Table 4. When implementing a new technology as a resource for patients' self-management of a chronic disease, nurses must identify their existing beliefs in order to inform and develop interventions designed to encourage behavioural performance by affecting the beliefs or exposing the individual to new views (White et al., 2015).

Table 4. Practical example of the three dimensions of the Theory of Planned Behaviour

Introducing a mobile phone app to a nursing home resident to improve compliance with medication times		
Type of beliefs	**Description**	**Example**
Behavioural Beliefs	Individual's beliefs about the ad-vantages/ disadvantages of performing a certain behaviour.	Using a mobile phone application will result in greater medication compliance.
Normative Beliefs	Individual's beliefs about whether im-portant referents approve/disapprove of them performing the behaviour.	Other nursing home residents wouldn't approve of me using a mobile phone application.
Control Beliefs	Individual's beliefs about whether internal and external factors may prevent/assist in the performance of the behaviour.	My mobile phone's small screen and low-quality sound prevent me from being alerted.

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Complementarily, in 2003, Venkatesh, Morris, Davis & Davis (2003), compared the parallels and variances between TAM and other widely referenced models and theories associated with technology acceptance and intention to use. According to the authors, "seven constructs appeared to be significant direct determinants of intention or usage in one or more of the individual models" (Venkatesh et al., 2003), which included performance and effort expectancy, social influence, and facilitating condition. Additionally, four key moderators (gender, age, the voluntariness of use, and experience) were introduced by the authors.

To understand these direct determinants of intention to use technology and usability, such as the patients' cognitive processes and previous knowledge, Lewis and Wharton (1997) developed the CWM. According to Bligård and Osvalder (2013), this method simulates the user's cognitive processes "when he/she carries out a sequence of actions in performing a given task, determining whether the user's background knowledge, together with hints from the interface, will lead to a correct sequence of goals and actions" (Bligård & Osvalder, 2013).

In this sense, the CWM is comprised of three stages ('preparation', 'analysis', and 'follow-up'), which the DigiNurse Model aims to present from the nurses' perspective. In the first stage - 'preparation' - potential patients with chronic diseases should be identified as should be the technology (e.g. computer, m-health app, smartphone, smartwatch) most suitable for implementation with potential to improve the patients' self-management abilities. Moreover, nurses should define the tasks needed in using the selected technology, "determining the correct sequence of actions" for the implemented tasks, and finding out how the patient reacts to the technology (and information provided) during these sequences (Parreira et al., 2019).

In the second stage - 'analysis' - a walkthrough of the chosen tasks is conducted, and nurses "pose four questions for each stage in the sequence of action", which are an aid to simulation of patient's cognitive process (Parreira et al., 2019):

- Is the patient making efforts and achieving the expected result?
- Is the patient aware that the right action is at his/her disposal?
- Is the patient linking the right action to the achievement of the expected result?
- If the right action is carried out, is the patient perceiving the advancement towards their expected result? (Blackmon, Polson, Muneo, & Lewis, 2002).

In final last step - 'follow-up' - proposals are given on how the patients' interaction with the technology can be changed to eliminate the discovered problems (or completely rethink a more suitable technological approach) (Parreira et al., 2019).

Technology acceptance is not a watertight reality, especially when applied to the process of self-management by patients with chronic diseases. The different motivational, behavioural, economic, cultural, and social realities emerge as current challenges that must be solved by the nurses of today. Such challenges are amplified by an increasingly aging population with more comorbidities, and unequal access to information, and necessary health and well-being services. Nevertheless, nurses must be aware that technology acceptance and use is highly influenced by:

- Perceived ease of use, usefulness and attitude toward use (TAM);
- Behavioural intention and the health behaviour of consumers of HITs (HITAM);
- Social roles, norms and self-concept interfere in the individual's behaviour (UTAUT and TPB model);
- Emotions and habits emerge as factors potentially affecting behaviours when analysing the individual's will to accept a new technology (UTAUT and TPB);
- User training, system characteristics, user participation in the design and implementation process nature (TAM).

Other factors that influence the integration and use of technology

Several reviews and research studies have explored factors which, positively or negatively, influence the implementation and use of eHealth support by patients, healthcare professionals or healthcare systems. Among the most frequently reported factors, international authors (Ciere et al., 2019; Ross, Stevenson, Lau & Murray, 2016) highlight the following categories:

i) eHealth technologies;
ii) eHealth interventions;
iii) Patients' individual characteristics;
iv) Healthcare professionals' individual characteristics.

In the context of e-Health technologies, the availability of devices and internet access (Tieu et al., 2015), as well as connectivity or user-friendliness (Jeffrey et al., 2019) are important factors for patients' adherence to

self-management support solutions. The design of the eHealth services is also considered a factor influencing patient commitment, in that unsuitable designs which do not meet the users' needs have been considered as a barrier to the implementation of eHealth services (Schreiweis et al., 2019). The 'usability' of digital health technologies, their 'clinical and economic benefits' and 'safety' have also been considered as hurdles that must be overcome to improve the integration of technology in the management of diabetes (Klonoff & Kerr, 2018). A concern related to the privacy of personal health data available online has also been expressed by users (Tieu et al., 2015).

In connection with eHealth interventions, healthcare professionals have reported an improvement of care brought by the intervention, easy access for patients to self-management support and a 'positive experience of patients' among facilitating factors (Ciere et al., 2019). In a patient perspective, the 'empowerment and self-management' brought by the interventions were considered a success factor (Granja, Janssen, & Johansen, 2018). A barrier identified by healthcare professionals was that the intervention had not addressed the needs of all patients and could only be adequate to a specific group of patients. Additionally, there are limitations to the integration of eHealth applications in at a healthcare institution (Ciere et al., 2019). Patients have shown concern about 'privacy and security' issues related to eHealth interventions (Granja et al., 2018).

Patients' individual characteristics have also affected the implementation of mHealth interventions. These characteristics have included patients' objection to self-management support (Ciere et al., 2019) as well as advanced age, lower education and lower economic resources (Agnihothri et al. 2018). Additionally, patients with chronic illnesses who lived alone and in rural regions were associated with lower eHealth use frequency (Reiners, Sturm, Bouw, & Wouters, 2019).

Regarding healthcare professionals' individual characteristics, the 'self-efficacy and skills', 'positive experiences' and 'knowledge' of healthcare professionals have been recognized as factors facilitating the implementation of eHealth interventions (Ciere et al., 2019). Additionally, the 'quality of healthcare' provided by healthcare professionals has been identified as the main factor fostering eHealth interventions (Granja et al., 2018). However, on the downside, healthcare professionals have reported work overload as a barrier to the implementation of eHealth solutions (Ciere et al., 2019).

In a systematic literature review conducted by Granja and colleagues (2018), costs (related to financial resources) were identified as the main

barrier to the implementation of eHealth interventions in health systems. Likewise, Agnihothri and colleagues (2018) identified a lack of reimbursement for healthcare professionals in using mHealth interventions to follow their patients remotely. From a patient perspective, a concern related to costs emerges in relation to the affordability of used technologies (Jeffrey et al., 2019). On the other hand, costs have also been considered a success factor of eHealth interventions due to funding obtained from governmental sources (Granja et al., 2018).

> A health intervention implemented through an mHealth solution allows healthcare professionals to have access to patients' digital data, as the solutions provide access to professionals to parameter measures related to the patient's condition.

Ethics and Data Protection

Self-management programs and interventions have been increasingly delivered using technological devices rather than in face-to-face encounters with healthcare professionals (Rotheram-Borus, Ingram, Swendeman, & Lee, 2012). A health intervention implemented through an mHealth solution allows healthcare professionals to have access to patients' digital data, as the solutions provide access to professionals to parameter measures related to the patient's condition. The purpose is to enable healthcare professionals to monitor and track the data (Agnihothri et al., 2018) to improve the efficiency of patients' follow-up treatment. However, despite the potential of using these technologies to improve healthcare provision, the use of individual data concerning health brings ethical concerns and challenges, such as data protection, focusing on privacy and security.

Data protection is considered a fundamental human right (European Commission, 2018). According to Article 8 of the Charter of Fundamental Rights of the European Union "everyone has the right to the protection

of personal data concerning him or her" (European Parliament, Council & Commission, 2000). In Europe, the current regulation on data protection is the Regulation 2016/679 generally referred to as the General Data Protection Regulation (GDPR), which was adopted by the European Parliament in 2016 (Regulation 2016/679/EU). According to the GDPR, in the context of healthcare provision, data concerning health is considered to constitute a special category of personal data and is defined as "personal data related to the physical or mental health of a natural person, including the provision of healthcare services, which reveal information about his or her health status" (Article 4 (15) of GDPR) (Regulation 2016/679/EU).

mHealth applications can collect general information and data concerning a person's health (European Commission, 2014a) as well as process these data, which raises concern about the adequate processing of data (European Commission, 2014b). The processing of personal data must be: 'lawful, fair and transparent'; have a 'purpose limitation'; take into consideration 'data minimization'; be 'accurate'; have 'storage limitation'; and ensure the 'integrity and confidentially' (Article 5 of GDPR) (Regulation 2016/679/EU).

Considered as sensitive information, the processing of data concerning health is generally not authorized. However, there are some circumstances in which this processing is possible, for example, when formal consent has been given by the person (in accordance with national law); when there is a crucial interest in the health data but the subject cannot consent; and when the information is vital, for example, for the purpose of healthcare provision or treatment, based on the European Union or Member State law, or if the processing is performed by a healthcare professional under obligation of secrecy (Article 9 of GDPR) (Regulation 2016/679/EU). In this sense, personal data must be collected and processed for specific and proper purposes (European Commission, 2014a). Regarding the informed consent to data processing, there are also some aspects that must be taken into consideration (Article 7 of GDPR) (Regulation 2016/679/EU).

mHealth interventions can trigger concerns related to security issues, given the ease of losing or damaging devices which are used to store personal health data, potentially leading to a serious security breach (European Commission, 2014b). According to Article 32 of the GDPR, to guarantee the secure processing of personal data, entities must apply proper measures, such as 'the pseudonymization and encryption of personal data' (p. 51); ensuring the 'confidentiality, integrity, availability and resilience of processing systems' (p. 52); have capacity to restore the access to personal data; and have a method for testing the effectiveness of the implemented security

measures (Article 32 of GDPR) (Regulation 2016/679/EU).

Data security seems to be a concern of eHealth' users, especially regarding the access to health personal data, privacy and the share of personal data with third parties (Anderson et al., 2016; Granja et al., 2018; Klonoff & Kerr, 2018). Ethics and Data protection document by European Commission (European Commission, 2018) defines 10 do's and don'ts of data security, which are listed below.

Do's:
- use GDPR-compliant tools to collect, process and store research subjects' personal data;
- take communications security seriously, and devise and implement dedicated protocols for your project as necessary;
- check the terms and conditions of all of the service providers you use (software, applications, storage, etc.) to process personal data within your project, in order to identify and mitigate risks to the data subjects;
- encrypt your research data and/or the devices on which they are stored, and ensure that keys/passwords are appropriately protected;
- consult your DPO or a suitably qualified expert for advice on how to achieve a level of data security that is commensurate to the risks to your data subjects.

Don't s:
- collect data on a personal device such as a smartphone without ensuring that they are properly protected (e.g. consider the implications of automatic back-ups to the cloud, and the device's security features);
- use free services that may use your participants' data for their own purposes in lieu of payment, or collect data or communicate with research participants via social media platforms without first assessing the data protection implications;
- use unencrypted email, SMS or insecure 'voice over IP' platforms to communicate with vulnerable participants or those who may be subject to state surveillance;
- expose personal data to unauthorised access or use when accessing them remotely (e.g. by using insecure wifi connections) or travelling to countries where your devices may be inspected or seized;
- assume that your research partners, collaborators or service providers have appropriate information security and data protection policies without checking that this is the case.

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Good practice recommendations

A report of the EU eHealth Stakeholder Group on the 'widespread deployment of telemedicine services in Europe' (2014) prepared several recommendations regarding the implementation and acceptance of telemedicine. Of these, we highlight the following:

- The access to telemedicine services should be equal to all patients;
- Telemedicine services should not completely replace the provision of face-to-face healthcare;
- All telemedicine acts performed must include a declaration of informed consent, safeguarding appropriate data protection;
- All healthcare professionals' curricula should integrate digital literacy, including development of digital competencies using eHealth resources;
- The benefits of providing tele-healthcare should be assessed permanently to justify its integration into evidence-based clinical practice;
- The provision of telemedicine care should be a person-centred approach instead of one centred on technology;
- The telehealth approach should increase the relationship of trust between patients and healthcare professionals;
- More research and evidence are needed to integrate telehealth as a standard evidence-based clinical practice.

Conclusions

Evidence suggests that eHealth interventions and programs can be effective in the prevention and management of some chronic conditions. The implementation of technology in the self-management of chronic diseases has been revealed to bring benefits for patients and healthcare professionals, namely the improvement of the patient's health condition, healthcare delivery and the patient-healthcare professional relationship. However, the self-management of chronic diseases supported through digital technologies has also faced some challenges. The available literature identifies several barriers to the implementation and use of digital health technologies which need to be overcome. Additionally, the use of data concerning health brings about important ethical aspects to take into consideration, namely personal data protection. Compliance with all legal and ethical aspects constitutes an important step towards implementing eHealth interventions.

Recommended reading

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6 The DigiNurse Model Integration into Curricula

The integration of the DigiNurse Model into curricula in different partner institutions varied due to structure of the local curriculum. Several pilots were organized to experiment the model during the development process. The duration and workload of the pilots varied based on the courses chosen and suitable for the piloting. Therefore, the examples of curricula integrations described in this chapter are unidentical giving various perspectives to integration possibilities. This will provide variety of options to utilize this model in the nursing education regardless of the specific structure of curriculum.

The DigiNurse Model was piloted in different phases of the model design process and the pilots were performed in two waves. Also, an international pilot was co-organized by all partners as the model was refined.

In this chapter all the partner institutions of the DigiNurse consortium present their higher education institutions and operating environments. They explain the structure of the pilots experimented and the experiences of students and teachers. Also, the suggestions on applying the model are provided by each partner institution based on their empirical experiences.

6.1 Integration Experiences in TAMK, Tampere, Finland

Annukka Isokoski and Nina Smolander

Tampere University of Applied Sciences (TAMK) is a multidisciplinary international higher education institution located in the city of Tampere in Southern Finland. TAMK provides education in 17 bachelor's degree programmes and 15 master's degree programmes in seven fields of study (i.e. business, catering, culture, health care, humanities, natural resources, social services, technology and tourism) and employs 720 staff members.

TAMK has 10,500 undergraduate students, of whom almost 3,000 are health and social care students in nursing, midwifery, public health, micro-biology, physiotherapy and social work. There are almost 2,000 new graduates annually. The duration of the Nursing degree programme is 3.5 years, including 210 cr.

TAMK is a member of the Tampere Universities community created in 2019, together with Tampere University. The key elements in the TAMK strategy towards 2030 are: to profile as a multidisciplinary and work-ing-life-oriented university of applied sciences, to be a forerunner in edu-cation export, to respond to the changing competence needs of working life and to use competitive advantages offered by the universities com-munity. TAMK's core values are work in a globally responsible manner and respecting the diversity in our community, succeeding by doing together and valuing activeness, learning and competence.

TAMK as an international university of applied sciences has over 335 partner universities in 55 countries and coordinates and partners in various projects nationally and internationally. For example, the DigiN-urse, DigiCare and SmartNurse projects, coordinated by TAMK, provide information on educational model designing, developing digital methods and environments for teaching and studying, and strengthening the intercultural competencies through international cooperation. Another important factor related to international project work is facilitating and supporting the capacity development in a bidirectional way. Furthermore, in TAMK the internationality in education is well-established; 13 degree programmes are conducted in English, including the nursing degree programme, and the significant flow of incoming and outgoing exchange students is constant.

TAMK's research, development and innovation activities are entwined around three impact areas that are targeted towards developing 1) learning capabilities in modern work environments and international networks, 2) adaptation of emerging technologies, and 3) ecological inno-vations and social challenges. These work as a framework for integrating both education and research from varying fields of studies, e.g., the Profitu project developing competencies in genomics in healthcare. Moreover, TAMK's development projects emphasise activities in real working life environments, bringing together various actors from the private, public and third sector, and customers and end users themselves in the Tampere Region.

Description of the pilots in TAMK

In TAMK, the pilots of the DigiNurse Model were scheduled into two piloting waves. The first pilot wave was integrated into an Education and Teaching Competence and Digital Communication (3-credit) course during the second year of nursing studies. The goals of the course cover the understanding of philosophical, ethical and pedagogical bases for education and teaching, and the ability to utilise client-oriented education and teaching methods. Furthermore, students learn to use digital teaching methods, plan and produce digital materials and evaluate the effectiveness of different methods. Learning counselling and coaching skills fits into the theme of the course, although they have not been a significant part of the content before.

The pilot was conducted with two student groups: nursing students in spring 2019 and paramedic students in autumn 2019. Both groups had a four-hour workshop. Prior to attending the classes, nursing students were instructed to fill in a health status report using a national online health assessment tool or a paper form or invent a health or well-being problem for themselves to be used during the classes. The structure of the first pilot wave included theoretical studies and practical small-group training. During the theoretical part, the background of the DigiNurse Model, including theory on coaching, positive health, salutogenesis, technology in self-management and ethical considerations on patient counselling, was discussed. Special attention was paid to distance coaching and digital tools, and the 5 A's and GROW coaching models were introduced.

The second half of the workshop was dedicated to the practical training of coaching in groups of three students. The roles of coach, coachee and

> " Furthermore, students learn to use digital teaching methods, plan and produce digital materials and evaluate the effectiveness of different methods.

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observer were circulated within the group. The home assignments were utilised as coaching topics, and coaching training was done using the 5 A's model and questions from the GROW model. Training sessions were recorded, and after each session the students utilised the recordings to assess the sessions. The recordings were for the students' self-evaluation only. Feedback was collected using the e-form.

The second piloting group benefited from the feedback provided by the first group and the practical training structure was modified. Prior to attending the classes, paramedic students were instructed to familiarise themselves independently on using the coaching models by watching the videos of different coaching sessions. Also, they received materials of the 5 A's and GROW models in advance. This helped them get oriented to the workshop, and the lessons were conversational.

The theoretical lessons were similar to nursing students, but the practical training was simplified, as the structure of mixing two coaching models appeared too complicated. In this pilot the students were instructed to use either 5 A's or the Grow model for a session. Each group tried both models during the practice and also dared trying one session of online coaching. Recording for reflection was included. The teacher circulated among the groups and clarified some things regarding the models and tasks at hand. The workshop was finished with a 30-minute reflection discussion and wrap-up. The students also filled the feedback form online through their mobile phones and laptops.

The alternative form of concluding this workshop was provided for absentees. They studied independently the pre-task materials and lesson notes and recorded their coaching sessions. The video and written reflection note on the coaching theories, and their application in nursing practice was returned together with the online feedback form. A short feedback from the teacher was provided. Based on the students' feedback this form of study also worked well.

The second piloting wave was integrated into clinical placement during the last year of nursing studies. These students studied the materials independently, trained during their practical training sessions at school and implemented the coaching in a real-life clinical placement. Also, they provided feedback via the e-form.

Nursing students' experiences on the implementation of the DigiNurse Model in Tampere

In total, 152 students participated in both piloting waves at TAMK. The median age of the participants was 22 years, and most of them were full-time students. The feedback questionnaire was completed by 66 TAMK students (response rate 43.3%) and 18 international pilot students (N=24, response rate 75%). The answers of the open questions were analysed using the qualitative content analysis. The reductions from the answers were grouped into subcategories and main categories. At first, the analysis of the TAMK pilot and the international pilot answers were started separately, but the data was merged because of the saturation and consistency of the results. The slight differences are discussed in Chapter 6.6 International pilot.

Students answered open-ended questions regarding what worked well and what was challenging for them as a coach and as a coachee. The main things working well for students as a coach were preparedness for the coaching session, diverse structure for coaching and establishing a patient-centred coaching situation. Preparedness for the coaching session included planning the coaching session and professional competence. The planning of the coaching session contained planning beforehand, good preparation and practicing and instructions of the models at hand. The professional competence contained substance knowhow, understanding the meaningfulness of a coaching model and advantages of the digital channels. The diverse structure for coaching also worked well for students. This was considered as handling the coaching session using structured questions of the models and an opportunity to add own questions outside of the model. Structured questions helped guide the conversation, and questions outside of the model gave students the communicative freedom to react to the flow of the conversation. Establishing a patient-centred coaching situation meant giving space to the coachee during the coaching session, using own personality in the coaching relationship, assessing the progress of the coachee and having a successful interaction in a peaceful environment for coaching.

Students experienced challenges as a coach due to a lack of pertinent professional capacity, lack of coaching competence and the challenging coaching environment. Pertinent professional capacity contained professional interaction skills such as supporting the introverted or very talkative person, communicational skills, substance knowledge and handling the negative situations, such as coaching a patient who is not ready to change

their habits. Coaching competence as a challenge included insufficient knowledge of coaching and skills of using coaching models, difficulties in choosing suitable questions for the coaching and staying in the role of a coach. Staying in the role of a coach was a challenge as they e.g., needed to learn to refrain from advising and opposing the patient's suggestions. The challenging coaching environment was described as involving social distraction during coaching, digitally performed coaching and coaching relationship challenges due to the non-physical connection.

Things that worked well for the students as a coachee were active participation in the coaching session and multiform coaching session. Active participation in the coaching session included the coachee's genuine presence, an active role in the problem-solving process, the possibility to express own opinions and supportive interaction with the coach. The multiform coaching session worked well because of the coachee's versatile pondering of their own situation, using awakening multiform questions, receiving information and being coached in one's own environment, e.g. coaching online at home.

In the coachee's role, students felt challenges due to taking responsibility for one's own situation and the coachee's personal ways of interaction. Taking responsibility for one's own situation included committing to coaching, accepting an active role as a coachee, being motivated to change and confronting the difficulties of executing said change in real life. The coachee's personal ways of interaction included challenges in sharing personal information and those arising from the coachee's characteristics. It was very important that the students got insight experience in the role of a coachee alongside the challenges that they will need to help their patients with.

Experiences and suggestions by the TAMK team on applying the DigiNurse Model

According to the experiences of the pilots in TAMK, the DigiNurse Model offers a novel approach to nursing education related to the digital coaching of patients with a chronic condition. Based on our experience, using and practicing the model encourages students to independently work together and take the initiative in recognising and solving problems, as well as creatively trying various digital tools and applications. Attention should be given to this phase of studies when using the model and practicing coaching.

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Student participation and activity during piloting was dependent on the student's phase of studies and greatly so on the awareness concerning the requirements of nurses' professional skills. Therefore, the content of the model might be difficult and challenging to practice if the DigiNurse Model is integrated into courses too early, e.g. during the beginning of the studies. Students should have enough theoretical knowledge related to chronic conditions and basic nursing skills, communication and dialogue prior to practicing the use of the DigiNurse Model.

In addition, deeper understanding regarding the content and benefits of using various coaching models requires enough experience of clinical practice. When the training and practicing of the model is in a suitable phase of studies, students experience the contentment and achievement during the DigiNurse training.

More information: Degree Programme in Nursing and Health Care, Nursing, Bachelor of Health Care. n.d. Retrieved from: https://opinto-opas-ops.tamk.fi/index.php/en/167/en/49595

6.2 Integration Experiences in Karelia, Joensuu, Finland

Pirjo Vesa

Karelia UAS is a multidisciplinary organisation offering education leading to bachelor's and master's degrees. Karelia UAS operates in seven study fields offering 21 programmes, of which five are master-level studies. The study areas are healthcare and social studies, business, engineering, forestry, media and hospitality management. Karelia UAS has 3,671 students and 277 staff members, and it operates in two campuses in close proximity to Joensuu city centre in easternmost Finland.

Karelia UAS is a significant and well-recognised operator in education and plays a key role in regional development and research, development and innovation (RDI) activities. Karelia UAS operates actively in various national and international networks. International partner networks include many Asian, African, European, and North and South American countries. China is one of the key partner countries where the education co-operation is actively and systemically developed in collaboration with the partners. In Karelia University of Applied Sciences, all students work closely with local companies and with other educational institutions on exciting

research and development projects. Each student builds a solid grounding in their field throughout their studies. The curriculum is customised to each student's own preferences and needs and is supplemented through close contact with prospective employers. A degree from Karelia University of Applied Sciences will provide the professional skills needed for a rewarding future.

A Bachelor's Degree in Health Care consists of professional studies (180 cr) and complementary studies (30 cr). 75 cr of the professional studies are reserved for practical training periods. The curriculum is organised for three and a half years, i.e. seven semesters. Complementary studies consist of two entities that are 15 cr each: Mental Health and Substance Abuse Nursing, and Palliative Care and Emergency Nursing.

Description of the pilots in the University of Karelia

For the piloting of the DigiNurse Model, we included second year nursing students. There were over 30 students in the group. The students received the theoretical instructions before the lesson, including the PowerPoint slides and the online measurement for the current health condition by email. The task was to orientate themselves to the coming face-to-face DigiNurse piloting phase. The students were familiar with dialogical methods and motivational interviewing in learning, which they had studied the previous year.

Face-to-face DigiNurse piloting: The piloting session took three hours and there were four teachers at the same time involved for the piloting in the classroom. Each of the teachers had a different role; one was a lecturer and a coach, another was a coachee, the third was an observer and evaluator, and the fourth teacher was the actual teacher of the group, looking over all the piloting and focusing on the students' learning. The classroom was organised in a manner where all the participants sat in a circle, including the teachers, and there were no desks in front of the participants. Firstly, a one-hour lecture was devoted to the DigiNurse Model, excluding the A5's model of the piloting. The emphasis was on coaching and the Grow Model. The aims of the piloting were given at the beginning of the session. After that the teachers role-played the coaching session in the roles of the coacher and coachee. The presentation lasted ten minutes. The focus was on the stressful life situation in the role-play.

During the next two hours the students practiced coaching in two rooms.

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They were divided into groups of three. Each of them had to experience the role of the coacher, coachee and observer, who wrote down experiences and other ideas of the coaching session in the tablet. They changed the roles so that each student experienced three roles. The teachers checked the students' progress while practicing and gave advice if needed. The cases for the coaching sessions varied and the students used them based on their own interests. At the end of the session, the students participated in an online piloting inquiry.

Evaluation: The feedback was positive, and the students liked the piloting session a lot. The atmosphere was enthusiastic. The students thought that the Grow Model was easy to understand and use. Some of them thought that the earlier lessons of motivational interviewing had been helpful in this piloting case. They had an idea what dialogue was about, and listening to what the patient had to say had increased their skills. They wondered what the real-life situation with the technical devices will bring about when it comes. They need to practice the use of the model.
As a result, the DigiNurse Model is integrated into the curriculum in the second and fifth semester courses.

6.3 Integration Experiences in Thomas More, Turnhout, Belgium

Hilde Vandenhoudt and Dorine Nevelsteen

With 40 professional bachelor's degree programmes, including a range of English-taught programmes, 16 graduate programmes, over 19,000 students and 1,800 staff in Antwerp, Geel, Herentals, Lier, Mechelen, Sint-Katelijne-Waver, Sint-Niklaas, Turnhout and Vorselaar, the Thomas More University of Applied Sciences (TM) is the largest breeding ground for highly-skilled professional talent in the province of Antwerp, where each talent is shown to its full potential. TM offers exchange programmes in English for students from partner universities. TM is also a strategic partner for numerous large and small companies, institutions and organisations in the wider region and beyond.

Its vision for 2030 consists of seven pillars: each TM degree will be future-proof; high expectations are connected to study success in an inclusive and student-centred community; the range of programmes and courses is comprehensive, dynamic and competitive; TM sets the standard in Flanders as an international University of Applied Sciences; its prac-

tice-oriented research has a real impact on professional practice and society; TM is an attractive employer for high-achieving professionals with guts, enthusiasm, focus and trust, its core values; TM is a smooth-running organisation. TM is a member of the KU Leuven Association, a network linking universities of applied sciences across Flanders and Brussels with KU Leuven. Together, they hold a prominent and influential position in Flemish and European Higher Education.

The bachelor's degree programme in nursing at TM campus Turnhout is a 240-credit training programme based on the current European guidelines. This translates into a 4-year programme that consists of theoretical content (1,534 hours, mainly in the first two years of training), skills training, and clinical education with a minimum of 2,300 hours of internship at different healthcare organisations. During these four years, the number of hours of clinical placement gradually builds up. The lion's share of the clinical placement is planned in years 2 and 3. More than 300 nursing students and 80 students attending a bachelor-after-bachelor programme are enrolled annually. TM has two other nursing programmes running in Lier and Mechelen.

The focus of the programme is on the professionalisation of the bachelor nurse, strongly anchored in the work field. At TM Turnhout, special attention is paid to the aspects of communication and coaching, primary healthcare, prevention and health promotion, as well as clinical reasoning, management and coordination. The goal is to expand innovative ways of internship, simulation education and supervised practical education as well as the (digital) educational approach.

Based upon the framework of the Canadian Medical Educational Directives for Specialists (CanMEDS), we built a curriculum with roles, competencies, learning lines, programme components, behavioural indicators and domain-specific learning outcomes.

We train future-proof nurses with expertise in clinical reasoning, interdisciplinary communication and collaboration, and the coaching of patients is focused on empowerment in health. At the end of the programme, our students are able to provide autonomous and quality care in complex and urgent situations. We train students to work in an evidence-based manner. During the programme, we stimulate their entrepreneurial, organisational and coordinating skills.

Description of the pilots in Thomas More, Turnhout

For the piloting of the DigiNurse Model, we included second and fourth year students. In the pilot testing with Year 2 students, we worked with four groups of 15-20 students (for a total of 68 students) in five sessions of two hours. The focus was on educating students in face-to-face coaching skills (self-management support) and giving them a small assignment on providing support through a digital tool.

Learning objectives: The student

- uses exploratory skills to map the health goal of a fellow student
- shows how they build rapport during a conversation
- uses exploratory skills to map the reality (current situation) of the other student
- applies the motivation tool in the conversation with the fellow student
- applies the exploration of options with regard to the health goal in the interview
- monitors the overview of the GROW structure in the interview
- explores the nature of resistance in the conversation with the other student
- demonstrates the ability to 'confront with care' in the conversation with the other student.

Each session was structured as a workshop in which students immediately started working with the theoretical concepts through practical exercises. The aim of session 1 was to clarify concepts such as the definition of coaching, the definition of health, the concept of positive health, and using the spiderweb dialogue tool. The desired coaching attitude was explained. The students learned about rapport building, the importance of the outcome, access to internal and external resources, the ecology, and the likelihood that the conversation will have a positive effect. The first coaching skill, 'exploring.' was shown and rehearsed, and the aspect of being aware of your own reference frame was discussed.

Exercises used in session 1:
- Role play: Demo by the coaching teacher and a volunteer student, using the spiderweb tool of the student.
- Assignment 1 in trio: Explorative discussion about the spiderweb, with one student as a coachee, one student as a coach and one observer. The observer focuses on the way of building rapport, exploring, using own reference frame, etc.

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Home assignment after session 1:

Coach your fellow student to reach their pre-set health goal based on their spiderweb. Work in groups of three and take up different roles (coach, coachee and observer). Develop a portfolio. Write a reflection on the process of acquiring skills in rapport building and exploring, based on the reflection model of Korthagen.

The aim of session 2 was to start with the first two phases of the GROW Coaching Model, the Goal and the Reality. Step-by-step, students practiced examples of good coaching questions to explore the health-related goal of the fellow student. They learned how to facilitate an objective and specific description of the current situation and assess the level of motivation by using the motivation scale. Attention was given to the following coaching skills: exploring (more in-depth), appreciating and endorsing.

Exercises used in session 2

•   Role play:

Demo by the coaching teacher and a volunteer student to explore the health goal and the reality. Second demo to explore the motivation for the health-related goal set by the fellow student.
Home assignment after session 2

•   Assignment 2 in trio:

Work in the same group of students and focus on the same health goal, explore the reality as is and assess the level of motivation to reach the health goal. If necessary, help your fellow student to redefine/refine the

> **At the end of the programme, our students are able to provide autonomous and quality care in complex and urgent situations.**

health goal. Add a reflection document on the assignment. The observer focuses on the aspects that were newly covered in the session.

The aim of session 3 was to give individual feedback and reflect on the student's personal development based on the home assignment. In session 3 there is room to focus on exploring, appreciating and endorsing. Furthermore, the whole GROW model is visualised. A reflection exercise in the group explores the link between the GROW model and person-centred care.

Exercises used in session 3

- Assignment on exploring, appreciating and endorsing
- Think of five objects that are linked to you; give this list to your coach
- The coach will explore how three of these objects are connected to you
- The coach will practice how to appreciate the coachee. This will in turn enhance the depth of the conversation.
- Demo of the GROW model by the teacher and a coachee with focus on the phases of the Goal, Reality and Options.

Home assignment after session 3

- Continue with your group of three and use the GROW model.
- Add a reflection document on the assignment to your individual portfolio.

The aim of session 4 was to give group feedback on personal coaching skills. The conscious competence learning cycle of Kolb was explained. The focus was on the next step, 'Will,' of the GROW coaching model which is part of shared decision-making.

Exercises used in session 4

Demo of step 4 in GROW by the teacher and coachee, the Will and the Way forward, with special attention to the use of positive language and formulating SMART goals.
- Practicing the GROW model in groups of three with focus on Will, the Way forward (shared decision-making and action plan).
- Home assignment 4
- Continue with your group of three and use the GROW model.
- Try to apply a digital follow-up of the action plan (SMS, WhatsApp, Messenger).
- Extend this exercise and coach someone in your environment or a

patient at your clinical placement. Add a reflection document on the assignment to your individual portfolio

The aim of session 5 was to gain insight into how one can facilitate a person's self-management by using the GROW coaching model. There is room for group feedback on the growth path in developing personal coaching skills. We also held a group discussion on the coaching skills that were not covered in the previous sessions, such as challenging, inspiring, allowing/accepting, creating space and relaxing.

Home assignment 5: final reflection task on the personal growth process

- After completion, the reflection report demonstrates that the student has gained insight into the coaching skills 'explore', 'appreciate and empower', 'confront with care', 'challenge', 'inspire', 'allow and give space' and 'relax', and can demonstrate personal growth in acquiring the above coaching skills and insight into the GROW step-by-step plan. The feedback on the final home assignment is provided by means of a rubric.

Pilot testing with Year 4 students

In total, 68 students participated. In this pilot we worked with four groups of 15-20 students. The focus was to let them experience autonomously what it means to be a coaching buddy of a patient with a chronic condition using a coaching model, applying coaching skills and shared decision-making, and stimulating health-promoting behaviour based on a vision of empowerment.

Learning objectives:

- The student coaches autonomously, from a vision of empowerment, shared decision-making, and health-promoting behaviour
- organises patient education and
- builds inter- and intra-professional relationships in order to facilitate the health-promoting behaviour of the patient.

Students were assigned to a patient with a chronic health condition at the beginning of the academic year. These patients were identified by 20 local healthcare organisations and provided informed consent. Students signed an agreement of collaboration with the healthcare organisation.

Students were expected to have bi-weekly face-to-face interactions with their patient. In between they could follow up by phone, mail, WhatsApp or text messages, depending on the preference and ability of the patient. The aim of the project was to support self-management and promote healthy behaviour through coaching sessions. Students were free to select a coaching model of their choice (motivational interviewing, GROW model or 5 A model).

Four intervision sessions (peer review) of two hours were planned throughout the year with groups of six students and a coach/teacher. Students were expected to upload their logbook before each intervision session and had to come up with an intervision question in advance. The logbook included a description of the healthcare organisation and the patient based on different domains of life, an overview of the activities and interactions that took place between the student and the patient, a follow-up on the learning goals and action plan, and the process evaluation (including success and encountered challenges).

Due to COVID-19, only two out of the four intervision sessions could take place face-to-face. The other two were organised virtually. Students were also expected to provide feedback to the healthcare organisation about the coaching process on at least two follow-up moments during the year. The assessment of this course was done by the progress described in the logbook, the participation during the intervision sessions and a reflection assignment on the process of self-management support. Students had to prove that they took into account the views of the patient, the (context of the) environment and society at large. An assessment instrument was developed and shared with the students. Students demonstrated their growth trajectory in self-management support based on this instrument during a digital oral assessment at the end of the academic year.

During the first semester, students had to read through a manual on integrated care. A board game that accompanies the manual was played during class in order to help the students become familiar with the concepts used in the manual.

Nursing students' experiences on the implementation of the DigiNurse Model in Thomas More, Turnhout

Developing the DigiNurse Model throughout piloting was an interesting journey. We present to you a few experiences in this journey:

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- It is important to discover that the needs of the patient are not the same as the perception of the needs by the healthcare professional. The perspective on the desired goal is often different for patients and caregivers (formal and informal).
- It is vital for students to experience the importance of taking time to build rapport with their patient, by being present and building trust. Building trust can be achieved by listening or doing an activity together. Being present is essential and is likely to stimulate change.
- One needs to learn to accept what the patient is willing to do, even when the students can see many more possibilities. One can only work with what is, with the input of the patient at that moment. Feeling frustrated and overcoming this feeling by letting time influence the process is an important experience.
- Setting boundaries and experiencing which role students can take up and which one they cannot is an important learning process.
- Healthcare needs can evolve and change over time or in a changing environment or context. This is perfectly fine. Therefore, one needs to assess the needs of the patient regularly.
- Students (and healthcare professionals in general) wish to see measurable results. Important steps such as building rapport and working on trust in the relationship are often not perceived as progress or successful steps in the coaching process, or as intermediate goals.
- How one asks questions with focus on the possibilities of the patient to take control of their own process is important. One does not need to take up the challenge itself.
- Clear communication with other healthcare professionals (formal and informal) who do the follow-up of the patient. Which roles did/do they take up already?
- It is critical as a coach to be aware of your own reference framework and not let it interfere in the coaching process.
- Adjust health education to the needs and capacity of the patient.
- Consider the patient as an equal partner in the collaboration (equality).
- Learn to feel satisfied with what has been achieved rather than focus on what hasn't.
- The GROW model is a convenient structure. More practice is needed to gain expertise in integrating the model (with regards to structure and philosophy).
- A potential pitfall as a teacher/coach is to intervene and 'problem solve' instead of accepting the process of the student. It is important to follow the pace of the student and not force their growth journey.
- The project provides the space and trust to discover one's own journey. Students were thrown into the deep end but felt accompanied by the

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coaches. It felt great to receive the trust from the coaches/teachers.

- Feedback on the teaching method of intervision was positive with regard to frequency, duration and content. Face-to-face interaction was experienced more positively than the digital version. Two hours of intervision is intensive and not to be underestimated.

Experiences and suggestions by the Thomas More team on using the DigiNurse Model

There is a lot of potential in using the DigiNurse Model in nursing education. Some parts can already be integrated into different courses, and the concepts used can become the common language. It's a good idea to have an overview of the step-by-step development in communication skills, coaching skills and digital awareness of the students.

Students and healthcare professionals wish 'to do things' and see the results of their actions. The pace at which a patient 'moves' through their self-management process is often (too) slow in the perception of the student. This perception is often also a belief of the teachers on the developing process of the students in their coaching skills. Personal growth takes place throughout the whole curriculum and is not related to a few assignments alone.

The evaluation of this type of nursing education can't be a product evaluation. The professional development is an ongoing process. Therefore, the evaluation should be a process evaluation. Even in the process evaluation of the DigiNurse Model, blended systems can be used. Finding a good balance between professional contact, personal engagement, and being genuine in the relationship is essential in building up the trustful and safe learning environment to integrate the DigiNurse Model.

6.4 Integration Experiences in ESEnfC, Coimbra, Portugal

Pedro Parreira, Beatriz Serambeque, Paulo Santos-Costa, João Graveto and Paulo Alexandre Ferreira

The Nursing School of Coimbra (ESEnfC) is a public higher education institution that is a pioneer of nursing education in Portugal, dedicated to teaching nursing, research and innovation in the health field. ESEnfC is located in three distinct Campuses, integrating a Health Sciences

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Research Unit (UICISA: E), two libraries and a Clinical Practice Simulation Centre. In the academic year 2019-2020, ESEnfC offered one bachelor's programme in Nursing (1st cycle), six master's programmes (2nd cycle), five postgraduate specialisation programmes and two postgraduate programmes, with a total of 2,039 enrolled students, 1,449 undergraduate students, 187 students in postgraduate specialisation programmes, 367 master's students and 36 students in other postgraduate programmes. ESEnfC integrates 244 faculty members (148 part-time), 85 staff members, 14 research fellows, 17 national and international advanced research trainees, and 102 integrated researchers and collaborators, and features 18 projects with national or international funding.

The nursing curriculum is organised into four academic years for the first cycle, organised further into several Scientific-Pedagogical Units, such as Medical-Surgical Nursing; Rehabilitation Nursing; Child Health and Adolescent Nursing; Maternal Health, Obstetric and Gynecological Nursing; Public Health, Family and Community Nursing; Mental Health and Psychiatric Nursing; Fundamental Nursing; and Elderly Nursing.

Description of the pilots in ESEnfC, Coimbra

ESEnfC's team applied two different approaches regarding the integration of the DigiNurse Model into the curriculum. For the DigiNurse Model Piloting, first and second waves, ESEnfC enrolled 16 undergraduate nursing students from the third and fourth academic years for a total of 12 hours, including a brief presentation of the DigiNurse Model and the related conceptual models (2 hours), the preparation of the piloting (3 hours), the performance of the piloting (4 hours) and the analysis and discussion (3 hours). In the DigiNurse Model Piloting, the Technology Acceptance Model (TAM), Positive Health Model, GROW Model, and 5 A's Model were the models used.

During the preparation of the piloting, the research team presented the DigiNurse Model and the objectives of the project. Additionally, the research team provided piloting-related training, such as an explanation of the objectives of the piloting and the structure of the teleconsultation. In the second wave of piloting, students prepared the teleconsultations as homework, by themselves divided into groups of three students, from different academic years, to allow the sharing of different levels of knowledge and experience in clinical settings. The elaboration of the clinical cases and the organisation and structure of the teleconsultations were performed by the students.

In the first wave of piloting, the research team implemented the following scenario: in a room, the nurse (nursing student) was doing the teleconsultation with two observers (nursing students) with a computer; in a second room, the patient (fictional patient) was receiving the teleconsultation with an observer (students) with a computer; and in a third room, the research team also observed the teleconsultation through the Zoom platform (with a computer). In the second wave of piloting, the students performed the teleconsultations from their homes, due to the COVID-19 pandemic, also through the Zoom platform. In this case, each teleconsultation was composed of the nurse, the patient and an observer (nursing students).

Due to the COVID-19 pandemic, the curricular programmes were subject to structural changes. Derived from this situation, there was the opportunity to develop an Optional Curricular Unit of the fourth year based on the DigiNurse project with 35 hours of dedication. The Curricular Unit Plan comprised the presentation of the DigiNurse project; the presentation of the DigiNurse E-book; the exploitation and critical analysis of the E-book contents; the preparation, performance, presentation, analysis and discussion of the Second Wave of Piloting; and the global evaluation of the Curricular Unit. Thirteen nursing students attended this curricular unit.

Nursing students' experiences on the implementation of the DigiNurse Model in ESEnfC, Coimbra

The students' feedback was extremely great. The students loved the project and considered this new experience a positive one, given that most of them reported that they were not familiarised with the coaching and the conceptual models, such as the Positive Health Model, GROW Model or the 5 A's Model.

The students stated that the coaching and follow-up of people with chronic conditions is a topic that is increasingly addressed, recognising its importance, and that it could be integrated into the nursing curriculum in different academic years.

The experience of the piloting, through teleconsultations, is a different approach from the ones the students are used to using. Additionally, some of them reported that they never thought it was possible to monitor patients from a distance but that they now considered it to be possible and effective. The students also highlighted that these strategies could be

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> " The students' feedback was extremely great.

the future and increase the accessibility of healthcare.

One of the most appreciated aspects is the active learning method, where students can simulate the monitoring of patients and reflect on their own performance as a future health professional through the learning-by-doing approach.

The students highlighted that the global experience will help them in their future clinical practice.

Experiences and suggestions by ESEnfC's team on using the DigiNurse Model

Here, ESEnfC's team presents some aspects that the members consider important for a successful integration of the DigiNurse Model in the nursing curricula of each Higher Education Institution, which the DigiNurse project envisages with both a top-down and bottom-up approach.

In the first approach (top-down), it is proposed to present the DigiNurse project in the coordination of the Nursing course(s), carefully selecting key elements to achieve success in the implementation.

In the second approach (bottom-up), which can be integrated with the afore-mentioned approach, it is proposed to contemplate the following steps:

- Invite teachers and present the key concepts that make up the developed DigiNurse Model, its components, developed pedagogical strategies, instruments (e.g., questionnaires and scripts) and the piloting that has been carried out, sharing the advantages, potentials, benefits and difficulties (a global picture of the project);
- Conduct a pilot study with teachers, who teach project-related

contents, and integrate the nursing students into a global pilot in the form of extracurricular activities. Gathering the experience will be decisive for the selection of the best way of implementation, overcoming the difficulties.

- Propose to the coordinators the integration of the DigiNurse Model in one or several curricular units, presenting the work developed as an improvement project for the department.

More information: Bachelor of Science in Nursing. n.d. Retrieved from: https://www.esenfc.pt/en/courses/100001

6.5 Integration Experiences in UNI-LJ, Ljubljana, Slovenia

Marija Milavec Kapun and Tina Gogova

The University of Ljubljana (UNI-LJ) is the oldest and largest university in Slovenia. It has 23 faculties and three art academies. In 2019, there were 37,615 students, 3,094 international students, 2,158 incoming and 1,655 outgoing exchange students, and over 6,000 employees, of whom over 4,000 were registered researchers. The main activities are higher education and research. Specific areas of cooperation are the exchange of students, and academic and administrative staff; Joint research activities/ projects; Joint conferences, seminars, workshops, symposia, courses, and/ or curricula.

The Faculty of Health Sciences is a member of UNI-LJ and is an academic health science and research institution with a national and international reputation. Since the mid-20th century, it has been noted especially for its highly effective, innovative and internationally comparable education and training programmes, scientific research and professional excellence, project work, and close cooperation with other Slovenian and European educational institutions. It is an educational and research institution in the field of eight allied health sciences: Sanitary Engineering, Midwifery, Occupational Therapy, Physiotherapy, Radiologic Technology, Orthotics and Prosthetics, Laboratory Dental Prosthetics, and Nursing. The faculty has 113 employees, of whom 83 are academic staff and researchers. A big advantage of the faculty is that it educates experts in several healthcare professional fields. This enables us to emphasise the importance of interprofessional collaboration in teams for students during their studies. The nursing study at the Faculty of Health Sciences is the oldest in the

country. Nowadays more than 100 first year students are enrolled in nursing studies each year. It is organised for the first cycle (three years of study) and the second cycle (two years of study). The study process is organised with collaboration with major academic staff from the Nursing Department and also from other departments. We also include field experts from different clinics. Clinical placement is organised with the collaboration of major healthcare and other institutions in Slovenia. The graduates are highly employable in Slovenia and beyond.

Description of the pilots in University of Ljubljana

For the piloting of the DigiNurse Model, we included third year nursing students (last year of study) who were divided into eight groups, with up to 15 students in each group. The total number of involved students was 116. Theoretical part: In the theoretical part of involving students in the project, which lasted one hour, we presented the DigiNurse project to the students and introduced them to the GROW and 5 A's models, as well as taught them how to use SMART goals in coaching. The students were given specific instructions and guidelines on how to conduct coaching with patients. The instructions for the students were:

- Choose a person (30 years or older) who has at least one CND in the students' local environment, but the person (patient) cannot be their relative or close friend.
- Organise the first coaching meeting in person (face to face).
- Decide with the coachee which ICT tool for digital/distance/tele-coaching is the most appropriate.
- Define one SMART goal with their coachee.
- Make an agreement on the interval of monitoring or coaching sessions.
- Implement (online) coaching for at least four weeks.
- The theoretical part was followed by the workshop, where the students gained practical skills in coaching, which was a crucial part. In the practical part of the training the focus was on the students' ability to develop the skill to ask the "right" coaching questions. The students had the opportunity to practice coaching at the faculty and then implement the health coaching process with their coachee.

Practical part: The students received an email with an invitation to participate in an online survey 10 minutes before the workshop. The short survey asked them what they would do in a described case of an overweight patient. After the survey the students had the workshop, during which

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they practiced how to formulate good coaching questions. For additional help, the students received cards with examples of coaching questions. To learn and gain experience, we used the experiential method of learning and formed small groups of students so they could practice coaching. Within these small groups of three students, they tried different roles (the role of a patient, coach, and observer).

The last part of the workshops was dedicated to discussion and instructions for their e-coaching with a real coachee. We also discussed ethical and (data) security issues during the entire process. After the workshop we asked the students to participate in the same online study (with the same case). This comparative survey allowed us to assess the knowledge gained during the workshop and the acquired skills on health coaching. The length of the workshop was three hours.

After a period of approximately 4-5 weeks, the students gathered and had a short debriefing for one hour with the aim of:

- assessing the coaching skills of the students,
- supporting the self-monitoring of coaching and coaching skills of the students,
- supporting self-perception on how coaching can influence the person,
- getting feedback from students about their experience as a health coach.
- The students also wrote a short semi-structured self-reflection report.

Nursing students' experiences on the implementation of the DigiNurse Model in Ljubljana

Most of the students had a very good coaching experience. Some students stated that they were extremely surprised by the results of the coaching; e.g. some patients managed to lose weight after several failed attempts. There were a few cases where students were asked by patients to continue coaching because they perceived the success of the approach. The students stated that they realised that, in addition to the benefits in healthcare, the coaching skills that they have gained will be useful in their personal lives as well.

As a benefit, they learned a more personalised approach to patients and the activation of their abilities. They also saw potential of using ICT in coaching.

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Nursing students were unfamiliar with the coaching before the piloting. There was some discomfort regarding the appointed assignment. They needed more support and motivation. By the end of the process, the students' experiences had been mostly positive. We observed that the students followed a more creative approach to dealing with the challenges of a coachee in the direction of involving the coachee/patient and their relatives more actively in other assignments. It was also perceived that they recognised the usefulness of digital technologies in a patient with CND self-management support.

Experiences and suggestions by UNI-LJ team on using the DigiNurse Model

Through piloting waves, the Slovenian DigiNurse team motivated other members of the department to get familiar with the DigiNurse Model. This model can be integrated into the renewal of the study programme included in the short-term plan of the Department of Nursing.
We see potential in using the DigiNurse Model in nursing education. Some part of it can already be included by individual teachers during the education process in the following areas:

- During education about self-management support to patients with chronic diseases or long-term care of the elderly.
- When focusing on the health promotion and health education of patients.
- From the perspective of the integration of digital technologies, individual elements can also be part of the study process within the field where students acquire ICT competencies.
- The entire presentation of the model and the practical application can be done within the course in community health nursing and primary healthcare.
- The usability of the DigiNurse Model is also seen in the discharge of patients from hospitals (secondary and tertiary level), when support and digital monitoring of the patient is recommended and during recovery at home (e.g. when the patient is in the phase of learning to take new medications or wound care) after hospital treatment.
- During clinical placement, when, with the support of the mentor, students can upgrade their practical skills using the DigiNurse Model.

More information: University of Ljubljana. Faculty of Health Sciences, Programmes. n.d. Retrieved from:
https://www.zf.uni-lj.si/en/study/programmes

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6.6 International pilots

Annukka Isokoski, Nina Smolander and Raija Kokko

International piloting was held in April-May 2020. The COVID-19 pandemic gave an insight into the importance of the subject of digitalisation in patient self-management support when teaching, working and studying online had become a new normal within a short period of time. On the other hand, many partner schools struggled to involve students in the piloting, as they were overloaded with the changes in studies. Also, many students were recruited to the workforce in healthcare. Regardless, a total of 24 students from four partner institutions participated in the pilot.

The international piloting included two webinars in the Zoom environment and instructed co-studying independently in the Teams environment. The first 2-hour webinar contained an introduction to the DigiNurse project, the developed model and its main themes: ethical aspects relevant to digital patient coaching, viewpoints of salutogenesis and self-management, patient coaching and coaching models and exploring the digital aspects of patient self-management and patient coaching. The working platform in Teams was also introduced and instructions for working were provided. Some additional material on the main themes was shared through the piloting platform.

Students introduced themselves in the platform and formed international pairs, agreeing to their own timetable for the coaching sessions. Each student created a short starting point story about their imaginary problem for the coaching session and familiarised themselves with the story and issue chosen by their partner. They acted in turns, being both the coach and the coachee, and recorded their sessions for reflection.

The second 2-hour reflection webinar was held a month after the first one. Students from each university made a short presentation about their experiences on the piloting, followed by facilitated discussions in small groups in Zoom break-out rooms. The students had a lively discussion, saying that online working and language barriers had felt scary beforehand, but that through practice and getting to know each other it became easy and natural.

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> *"Coaching in English seemed very frightening to me at first. But during coaching I noticed that it's not that bad when you don't come up with a word. Usually the person you are talking to understands what you want to say."*
>
> *"This is really an important skill for a nurse because digitalisation is widely growing in health sectors."*

New friendships formed, and some students noted that cooperating online with students from a different country felt almost like having been in an exchange abroad. They also gained insights on studies and health-care systems in different countries and learned different forms and possibilities to apply coaching skills in their future profession.

> *"This project allowed us to have new experiences and live moments with persons from different countries that taught us new things, but also fun times."*
>
> *"I think that the theoretical models were a big help for us to guide the coaching session, especially the GROW model, and it is really important to keep improving their use."*

In addition to the reflection seminar, each student wrote a personal feedback note of their experiences and lessons learned during the international pilot. The students also answered the feedback questionnaire (N=18, response rate 72%) used in the TAMK pilots. The median age of the respondents was 22 years, and the respondents' distribution was: TAMK four students, Thomas More three students, ESEnfC three students and UNI-LJ eight students.

The content analysis of the open questions started separately but it was soon noted that the answers coincided remarkably with the analyses of the students' feedback in the TAMK pilots (See the summary of the analysis in Chapter 6.1). Especially prominent themes in the feedback of the international pilot were feelings of overall positivity and new experience, overcoming language barriers, opportunities enabled by online connections and the efficiency of using distant coaching.

The students described their experiences of online coaching very positively, having a fun and interesting time during the pilot. Despite being new and unfamiliar for some, the online setup didn't disturb anybody too much. Conducted from their own homes, the experience felt comfortable, pleasant, safe and convenient. Online coaching was also time-saving

and effective regardless of the occasional Internet problems. Overall, the students felt the experience to be professionally beneficial, and the opportunity to share topics of interest internationally felt nice.

The students recognised various advantages in online coaching and the use of digital tools. They can offer efficient healthcare services, including time efficiency, financial benefits (e.g. cutting down on unnecessary travel), convenient accessibility, a secure coaching environment and empowered self-management. A secure coaching environment meant the coachee may feel safe, comfortable, confident and protected while being in their own environment. Empowered self-management contained the use of digital tools that empowered and brought more opportunities to the patient in self-monitoring and goal tracking.

In addition, the students reflected on the disadvantages in the use of digital tools. They felt the ICT problems may hinder self-management support due to data security issues, technical problems and the requirement of digital skills. Also, the use of digital tools requires a lot of patience, and one may not concentrate as much on coaching as on a face-to-face situation.

In addition to student feedback, the co-teaching experience of nursing teachers was a pleasure, an excellent way to enjoy teaching and learn from each other.

To summarise the key lessons from the international pilot experience:

· The international pilot enhanced students' coaching skills as well as the skills and courage to work in online settings and in a foreign language.
· Co-teaching online worked well and can benefit partner institutions and individual teachers.
· Timetable issues and fitting the content to different student groups' programmes as well as the language barriers may challenge such international studying on a bigger scale outside the project's scope.

The feedback from the international pilot was a very positive and enriching experience and encouraging to all attendants. It was encouraging enough to continue the similar co-teaching style and format in the future. The most prominent impression of the international piloting webinar was the common feeling of meeting old friends as the second webinar started. This form of co-studying and co-learning can truly be recommended.

7 Discussion

In this chapter I describe some of the challenges and achievements that the DigiNurse team encountered on their way towards the end of the project. The journey offered obstacles but also feelings of success to the team. Without this DigiNurse team, we would never have built a Trust Coach with teachers and students, driving along the Milky Way towards the KISS and RIDE zone and improved quality of life of a person. This innovative approach demanded a good team spirit from the DigiNurse consortium, and luckily we had it. We also utilised challenges for our learning, and you can find suggestions for solutions.

At the end of the chapter, you will find recommendations for the implementation of the model and our regards to the members of the consortium, the staff at the participating institutions, collaborators, and all who have been involved in the project process.

7.1 Reflections of the Project Process - Challenges and Achievements

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The development process of the project advanced mainly smoothly. However, there were some challenges on the way which slowed the advancement. For instance, the timing of vacations between the institutions varied and therefore the actual and active project time was shortened. English was a foreign language to all project participants and hence the translations of some of the key concepts from English to a national language and context proved troublesome. For instance, the translation of 'self-management' into Slovenian or Flemish, while still keeping the same agreed meaning, was a challenge. Similarly, there was variation in understanding the concept of 'coaching' in healthcare in different countries. This was a significant issue, as coaching was one of the model's fundamental concepts.

The project team was culturally diverse and included various competencies, which was positive. However, at the same time this cultural diversity and a mixture of competencies slowed the project's progress because

we had to find a common language and understanding despite cultural differences and diverse ways in communicating. The team members had to take a timeout to understand each other's aspects, which differed in several ways. This timeout was necessary for fruitful collaboration.

Furthermore, because the institutions' curricula were different, there were challenges in scheduling activities and piloting instructions, although the frame for piloting was the same. Due to curriculum differences it was demanding to create one single instruction for pilots. Therefore, the partners adjusted the specific piloting protocol to their national context and curriculum themselves. The international pilot formed an exception. It was organised as webinars, with the students organising practicing in between sessions, and succeeded well according to the teachers' and students' feedback. Pilot feedback was collected using a questionnaire which was especially developed for this project. During international piloting, the students practiced their online communication, coaching and language skills. In addition, they established relationships and intended to continue networking with each other. The students will disseminate their digital coaching skills in their future nursing. A heterogenic rather than uniform approach to piloting proved to be valuable and useful, because learning took place despite the various methods, resources and environments. The most important achievement of piloting was that the DigiNurse Model showed its functionality in patient guidance, and it can be integrated to the curriculum in various ways.

Some technical and security challenges existed at the beginning of the project. Sometimes online connections between the consortium participants were not very good. This is still one of the most common problems in online communication (Foronda & Lippincott, 2014). The most harmful technical problem took place in February 2020, when we suddenly lost content in our shared online platform due to human misunderstandings and technical issues. Approximately only half a year was left before the project's original deadline. The platform we used was not recommendable in the first place due to the security risk. We were not informed about the security risk beforehand; we only found out this fact after the damage had already been done. Fortunately, we managed to get nearly all the files back thanks to back-up booths. Though information security problems were a concern at the beginning, they were finally eased thanks to the ability to use a password for online meetings. These concrete challenges gave the consortium valuable insight into the high importance of data security in all aspects of the project work, also emphasised in the DigiNurse Model.

> The project team was culturally diverse and included various competencies, which was positive.

The cooperation with ICT companies did not succeed as originally planned. We contacted some companies, but unfortunately curriculum development did not belong to their areas of interest. Some of them had online communication applications or new devices under development, but the universities would have had to rent them, and the rental price was too high. Therefore, we decided that the students would practice the use of different online applications used in healthcare during their clinical training periods, where it was possible. In addition, close collaboration with health technology living labs could be one way to integrate this part into the curriculum.

The development of the DigiNurse Model continued at the monthly online meetings of the consortium. In 2018, when the consortium had the second transnational meeting in Coimbra, the Belgian partners presented the first visual draft of the model (More information in Chapter 5.1). The refining of the model proceeded after commenting and discussion, and the Belgian partners created the next version, amounting to a total of five different versions. While creating visual images of the model, the project members continued the theoretical development of the model. The chosen concepts were repeatedly and intensively discussed and commented. The team sent the last visual draft to TAMK's Communication Coordinator to finalise the design in August 2020. The first of the three main goals (Intellectual outputs) of the project was ready.

The elements of the model were piloted in order to get ideas for its improvement (More information in Chapter 5.1). The students received theoretical education on coaching techniques and methods. After that they first practiced the use of their digital coaching skills with each other. For example, in Belgium students could practice coaching with patients who

had given their consent. International pilots between the students took place in spring 2020 (More information in Chapter 6.6).

According to feedback from teachers and students, international piloting was a success and an excellent experience. In the future, teachers and students wish to continue international cooperation and further develop the current model. In addition, networking between universities strengthened in this way. However, the project team did not evaluate students' acquisition of face-to-face or digital caching skills because it was difficult to make an appropriate evaluation tool. The group of teachers developed an instrument, but further work is needed in the validation and integration evaluation of coaching skills in the curriculum.

The integration of the model to the curricula of the participating institutions has taken place and this process continues. The integration is done in different ways according to each institution's protocol and resources. The DigiNurse Community has grown beyond the consortium. The DigiNurse website was published about one year later than planned. The new consortium of the universities in Tampere (University of Tampere, Tampere University of Technology and Tampere University of Applied Sciences TAMK) started in January 2018, and it established a new mutual website with its official colours and settings. The DigiNurse Community has members in Asia within a project named "Educating students for digitalized health care and coaching: DigiCare" that started in 2018. The Asian consortium consists of three institutions of higher education in Bangladesh, three in Vietnam and two in Europe. The third group of members of the Community is in Latin America, where there are two universities from Mexico and three from El Salvador. They form a consortium with two institutions of higher education from Europe, the University of Ljubljana from Slovenia and TAMK, in the project "SmartNurse: Developing teachers' and student nurses' competencies in digital nursing" which started in autumn 2020. TAMK coordinates all these three projects related to digital nursing communities. The DigiNurse Community blog for members of the Community is under construction.

The situation with COVID-19 has caused both positive and negative consequences to the completion of the project. The participants learned to use various online communication tools and methods fluently. This has created positive feelings of coping among the participants, both teachers and students. However, online working for several months was sometimes felt to be tiresome and frustrating by teachers and students. The consortium was able to meet face-to-face five times. These face-to-face meetings

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were extremely important for the emergence of a spirit of unity, support and motivation.

Also, the COVID-19 pandemic influenced cooperation with nursing schools and healthcare institutions. There were less contacts with mentors and teachers. Furthermore, nursing schools were in lockdown for several weeks in spring 2020. In addition, healthcare institutions recruited students for clinical work, and many students were unable to do schoolwork at the same time as they did clinical work. Fortunately, an option to use virtual communication decreased this inconvenience, underlining how topical the DigiNurse approach is in nursing education.

When considering the expected impacts of the DigiNurse Community (Figure 42), the project team has proceeded very well. The teaching and training staff of the consortium has participated in the development and integration of the model, and hopefully this collaboration will continue at the DigiNurse platform where healthcare students and professionals can share their experiences on digital nursing. The Community has expanded to other countries in Europe and beyond. However, the Community is newly established and there is still a lot of work to be done to make it a success. Although the Community is established, the future will show its sustainability. However, its future sustainability looks bright because, at least for the next few years, the Community's close cooperation will continue thanks to the Asian DigiCare and Latin American SmartNurse projects.
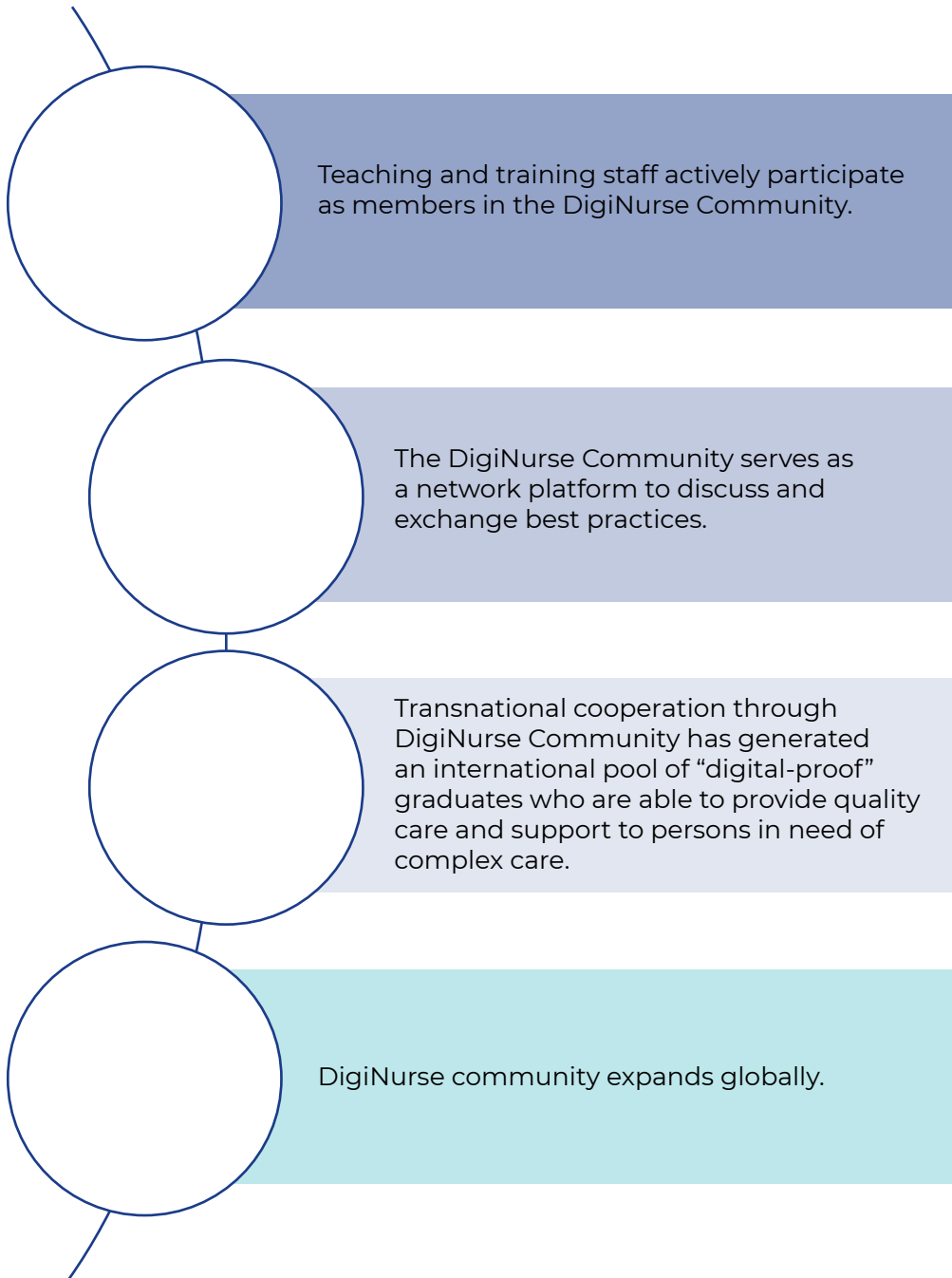
Teaching and training staff actively participate as members in the DigiNurse Community.

The DigiNurse Community serves as a network platform to discuss and exchange best practices.

Transnational cooperation through DigiNurse Community has generated an international pool of "digital-proof" graduates who are able to provide quality care and support to persons in need of complex care.

DigiNurse community expands globally.

FIGURE 42. The expected impact of the DigiNurse Community

Educational events between the partner universities as well as for out-siders have been organised. The outsiders consisted of e.g. hospital staff and people from local co-operation partners. However, cooperation with the representatives of the third sector and students' clinical mentors was limited in some partner universities. This was due to the patients' short hospital stays and nursing students' short and changing training place-ments. It was hard to organise possibilities to practice in continuity of care, one of the basic conditions for good and high-quality coaching. The COVID-19 pandemic made the situation even more challenging, because healthcare employers recruited a lot of students for clinical work and sub-sequently did not have time for school assignments.

Throughout the whole process the consortium disseminated information about the project. The participants prepared posters and abstracts, kept both oral and virtual presentations at conferences and wrote articles. A doctoral thesis was completed during the process in spring 2020, when Marija Milavec Kapun from the University of Ljubljana received a doctoral degree in Health Sciences. The DigiNurse Community website was estab-lished, and later the DigiNurse Community will comprise the projects of DigiCare in Asia and SmartNurse in Latin America. The participants of the DigiCare Asia project have participated twice in the DigiNurse workshops and they have been able to hear and discuss the advancement, pitfalls and achievements of the project. The main features of the course of the project are presented in Figure 3, Chapter 2.

7.2 Conclusion

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The project produced the generic DigiNurse Model, which was the first of the three intellectual outputs of the project. Using the DigiNurse Model, the students practiced digital coaching during their studies and felt that they were better equipped than before to take on the challenges of dig-italisation in healthcare settings. The DigiNurse Community, the second intellectual output, continues to expand. The third intellectual output consisted of the DigiNurse guidelines. This e-book includes the guidelines, and therefore one can say that all three goals (intellectual outputs) of the DigiNurse project are achieved. The e-book includes guidance on how to provide quality face-to-face and digital coaching to patients with a chronic condition. In conclusion to the project process, we introduce the following recommendations for the implementation of the model:

The recommendations in implementing the DigiNurse Model:

- Enclosing ethical considerations in every aspect
- Using active pedagogical methods and approaches
- Utilising evidence-based knowledge and skills in teaching and coaching
- Encouraging innovative perception of digital and technological possibilities in learning, teaching, coaching, self-management support and nursing
- Designing student-centred approaches
- Creating and preserving a safe learning environment of trust and a sharing zone
- Utilising coaching methods and tools in teaching and learning
- Incorporating digital methods and technological tools to teaching and learning
- Encouraging and joining the international multidisciplinary co-operation, collaboration and teamwork, e.g. the international DigiNurse Community and international exchanges between students of different nursing schools

The end of the project approaches. The TAMK team would like to thank you all, dear project members and students of each institution. It has been enjoyable to make an acquaintance with you, to collaborate with you, and to celebrate with you! We have been lucky, because we have had a project team of great persons, great personalities and, especially, great professionals. We have generated ideas, and supported and encouraged each other. We have also agreed and disagreed, discussed and rediscussed, but always finally reached a consensus.Thank you all!

Furthermore, at each project institution there are a lot of people who have worked hard and participated in many ways in this DigiNurse project. Equally, all the stakeholders and participants in different events have provided valuable feedback throughout the project. They have enabled the project's success. We cordially thank you all from the bottom of our hearts. Thank you!

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